



By Tyler Inman

~~Practice makes perfect.~~

~~Perfect practice makes perfect.~~

Perfect practice while routinely sleeping 8 hours per night makes perfect.

Lethal squads and platoons are forged through hard, realistic training. To that end, my boss used to say that Infantrymen learn via two mechanisms: “repetition and blunt force trauma.”

I was on the receiving end of blunt force trauma training events more than once. My boss was correct; those lessons are stamped on my brain. Attempting to decode why exactly the artful method of “blunt force trauma” is so effective might prove difficult for science. Repetition, on the other hand, is well-studied. Thanks to tools like functional magnetic resonance imaging (fMRI), researchers can tell us a great deal about repetition and the science of memory, concentration, motor-skill, and reaction time. One of the facts researchers might tell us is that high-quality sleep vastly improves all of the aforementioned qualities.

Efficient Automaticity

When a Soldier initiates a battle drill like react to contact, we want him to remember what to do; we want him to react quickly; we want him to perform some tasks without conscious thought; and we want him to persist as long as the threat remains. Put more succinctly, we want *efficient automaticity*. Scientific investigation in this area has revealed some key insights every Army leader should know:

- Memories associated with the performance of skilled motor tasks (putting an individual weapon system into operation, engaging the enemy with direct fires, gun laying, etc.) are not transferred from short to long-term memory like other learned facts.
- Motor memories are actually shifted to “brain circuits that operate below the level of consciousness,” contributing to the instinctual nature of some automated movement routines. We commonly refer to this as muscle memory (Walker 2017, 127).
- **Proper sleep results in a [20% increase in motor speed](#) with no loss of accuracy. The obvious implication is that Soldiers can significantly**

increase performance of skilled tasks by getting a full night of quality sleep after training.

- The rich brainwave activity that is responsible for creating motor memories that allow us to perform skilled tasks like second nature occurs **primarily during the last 2 hours of an 8 hour sleep period** (Ibid).

Concentration

Consider a scenario in which a Soldier is charged with operating a guard post for several hours. Given 8 hours of sleep prior to the shift, the Soldier performs the task with very few lapses in concentration or “[micro-sleeps](#).” The same Soldier executes the same task the following day, but this time the Soldier was not afforded an opportunity to sleep. As expected, he performs poorly and misses several key radio calls due to micro-sleeps.

Here’s what science tells us about exactly how poorly the Soldier would actually perform in this scenario:

- After only 1 night without sleep, the Soldier would experience a **[400% increase in concentration lapses](#)**.
- Perhaps unexpectedly, the Soldier would experience the same performance decrement if tested after 10 days of only 6 hours of sleep per night.
- **This is worth repeating: 10 days of 6 hours of sleep per night has the same negative impact on concentration as not sleeping for 24 hours straight.**
- A Soldier experiencing a micro-sleep is not just slow to react; he’s likely to miss the signal for action and not react at all.
- After such an event, even three full nights of recovery sleep are not enough to return performance to baseline levels (Ibid, 140).

Learning

Do the Army's institutional methods for developing leaders set conditions for optimal retention of lessons learned? Do unit-level training and education programs consider how well Soldiers actually retain shared knowledge? Leaders should carefully consider training objectives when setting conditions for each training event. The need to *test* Soldiers under less than ideal conditions should be balanced with the need to *teach* Soldiers in an environment conducive to learning. Consider these facts for your next training event:

- “The most elemental units of the learning process — the production of proteins that form the building blocks of memories within... synapses — are stunted by the state of sleep loss” (Ibid, 154)
- If you don't sleep well the night before learning, there is a **40% deficit in the ability to learn new facts** or make new memories.
- Effective memory *consolidation*, the process of transferring new memories to long-term storage, is also **bolstered by 20 to 40%** in well-slept humans.

Endurance athletes are likely familiar with the adage “live high, train low.” This encourages athletes to take advantage of the physiological adaptations benefitting aerobic performance that occur as a result of living at altitude so they can perform better at low altitude.

Learning while under-slept is the endurance training equivalent of “live low, train high.” Not only does this idea defy common sense, it neglects the very nature of the physiological mechanisms responsible for improved performance. It's not just difficult to learn something new while underslept because we can't concentrate; sleep deprivation actually handicaps the fundamental physiological processes that result in a new memory.

“But I perform just fine as long as I get 5 hours of sleep per night!”

It's true the human body can acclimate to many conditions and sleep is no exception. Our

bodies *do* get used to sleep-deprivation; chronically underslept individuals get used to lower alertness, decreased focus, and reduced energy. But like a drunk person arguing they're "OK" to drive home, a sleep-deprived person does not recognize the drop in performance that results from being under-slept. Soldiers cannot "power through" a work week on 5 to 6 hours of sleep per night without a significant drop in performance. Moreover, even 3 nights of full recovery sleep on the weekend would not restore performance levels to baseline.

Army leaders routinely report statistics related to training, physical, medical, and personnel readiness during unit training meetings. Accordingly, leaders manage those areas of concern while ideas that remain unmeasured, like *cognitive readiness* (mental preparedness for the rigors of combat) are rarely considered. Sleep's impact on cognitive readiness alone makes it at least a critical shaping operation for training readiness.

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Works Cited

Walker, Matthew. [Why we sleep: Unlocking the power of sleep and dreams](#). Simon and Schuster, 2017.

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