

## **The Power of Purposeful Practice**

- The most effective and most powerful types of practice in any field work by harnessing the adaptability of the human body and brain to create, step by step, the ability to do things that were previously not possible.
- Research has shown that, generally speaking, once a person reaches that level of acceptable performance and automaticity, the additional years of “practice” don’t lead to improvement.
- *Purposeful practice has well-defined specific goals*—e.g., “Play the piece all the way through at the proper speed without a mistake three times in a row.” Without such a goal, there is no way to judge whether the practice session has been a success.
- Purposeful practice is all about putting a bunch of baby steps together to reach a longer-term goal.
- The key thing is to take a general goal—get better—and turn it into something specific that you can work on with a realistic expectation of improvement.
- *Purposeful practice is focused*—you seldom improve much without giving the task your full attention.
- *Purposeful practice involves feedback*—You have to know whether you are doing something right and, if not, how you’re doing it wrong. . . . Generally speaking, no matter what you’re trying to do, you need feedback to identify exactly where and how you are falling short. Without feedback—either from yourself or from outside observers—you cannot figure out what you need to improve on or how close you are to achieving your goals.

## **The Limits of Purposeful Practice**

- *Purposeful practice requires getting out of one's comfort zone.* . . . The best way to get past any barrier is to come at it from a different direction, which is one reason it is useful to work with a teacher or coach. Someone who is already familiar with the sorts of obstacles you're likely to encounter can suggest ways to overcome them.
- Generally speaking, meaningful positive feedback is one of the crucial factors in maintaining motivation.
- So here we have purposeful practice in a nutshell: Get outside your comfort zone but do it in a focused way, with clear goals, a plan for reaching those goals, and a way to monitor your progress. And, vitally, you must maintain your motivation.

### **Chapter 2: Harnessing Adaptability**

- The brain rewires its networks in various ways—by strengthening or weakening the various connections between neurons and also by adding new connections or getting rid of old ones. There can also be an increase in the amount of myelin, the insulating sheath that forms around nerve cells and allows nerve signals to travel more quickly; myelination can increase the speed of nerve impulses by as much as ten times.
- Pushing too hard for too long can lead to burnout and ineffective learning. The brain changes most quickly in that sweet spot where it is pushed outside—but not too far outside—its comfort zone.

### **Chapter 3: Mental Representations**

- A mental representation is a mental structure that corresponds to an object, an idea, a collection of information, or anything else, concrete or abstract, that the brain is thinking about.

- Much of deliberate practice involves developing ever more efficient mental representations that you can use in whatever activity you are practicing.
- What sets expert performers apart from everyone else is the quality and quantity of their mental representations. Through years of practice, they develop highly complex and sophisticated representations of the various situations they are likely to encounter in their fields—such as the vast number of arrangements of chess pieces that can appear during games.
- The more you study a subject, the more detailed your mental representations of it become, and the better you get at assimilating new information.
- The superior organization of information is a theme that appears over and over again in the study of expert performer.

#### **Chapter 4: The Gold Standard**

Deliberate practice is characterized by the following traits:

- Deliberate practice develops skills that other people have already figured out how to do and for which effective training techniques have been established. The practice regimen should be designed and overseen by a teacher or coach who is familiar with the abilities of expert performers and with how those abilities can best be developed.
- Deliberate practice takes place outside one's comfort zone and requires a student to constantly try things that are just beyond his or her current abilities. Thus it demands near-maximal effort, which is generally not enjoyable.
- Deliberate practice involves well-defined, specific goals and often involves improving some aspect of the target performance; it is not aimed at some vague overall improvement. Once an overall goal has been set, a teacher or coach will develop a plan

for making a series of small changes that will add up to the desired later change.

Improving some aspect of the target performance allows a performer to see that his or her performances have been improved by the training.

- Deliberate practice is deliberate, that is, it requires a person's full attention and conscious actions. It isn't enough to simply follow a teacher's or coach's directions. The student must concentrate on the specific goal for his or her practice activity so that adjustments can be made to control practice.
- Deliberate practice involves feedback and modification of efforts in response to that feedback.
- Deliberate practice both produces and depends on effective mental representations. Improving performance goes hand in hand with improving mental representations; as one's performance improves, the representations become more detailed and effective, in turn making it possible to improve even more.
- Deliberate practice nearly always involves building or modifying previously acquired skills by focusing on particular aspects of those skills and working to improve them specifically; over time this step-by-step improvement will eventually lead to expert performance. Because of the way that new skills are built on top of existing skills, it is important for teachers to provide beginners with correct fundamental skills in order to minimize the chances that the student will have to relearn those skills.
- Once you have identified an expert, identify what this person does differently from others that could explain the superior performance.

### **Principles of Deliberate Practice on the Job**

- One benefit of “learning while real work gets done” is that it gets people into the habit of practicing and thinking about practicing.
- One standard approach for examining the mental representations that people use to guide themselves through a task is to stop them in the middle of the task, turn out the lights, and then ask them to decide the current situation, what has happened, and what is about to happen.

### **Principles of Deliberate Practice in Everyday Life**

- If your mind is wandering or you're relaxed and just having fun, you probably won't improve.
- Focus and concentration are crucial so shorter training sessions with clearer goals are the best way to develop new skills faster.
- The hallmark of purposeful or deliberate practice is that you try to do something you cannot do—that takes you out of your comfort zone—and that you practice it over and over again, focusing on exactly how you are doing it, where you are falling short, and how you can get better.
- To effectively practice a skill without a teacher, it helps to keep in mind three F's: Focus. Feedback. Fix it. Break the skill down into components that you can do repeatedly and analyze effectively, determine your weaknesses, and figure out ways to address them.
- Successful mental representations are inextricably tied to actions, not just thoughts, and it is the extended practice aimed at reproducing the original product that will produce the mental representations we seek.

- To push past a plateau, figure out exactly what is holding you back. What mistakes are you making, and when? Push yourself well outside of your comfort zone and see what breaks down first. Then design a practice aimed at improving that particular weakness.
- The available evidence indicates that willpower is a very situation-specific attribute. People generally find it much easier to push themselves in some areas than in others.
- Studies of expert performers tell us that once you have practiced for a while and can see the results, the skill itself can become part of your motivation.
- Another key motivation factor in deliberate practice is a belief that you can succeed. In order to push yourself when you really don't feel like it, you must believe that you can improve and—particularly among people shooting to become expert performers—that you can rank among the best.

### **The Road to Extraordinary**

- People who develop skills in a certain area through years of practice seem to get a great deal of pleasure from engaging in that skill. . . . It is . . . possible that the practice itself may lead to physiological adaptations that produce more enjoyment and more motivation to do that particular activity.
- The adult brain may not be as adaptable in certain ways as the brain of the child or adolescent, [but] it is still more than capable of learning and changing. Additionally . . . the adaptability of the adult brain is different from the adaptability of the young brain, [so] learning as an adult is likely to take place through somewhat different mechanisms. . . . If we adults try hard enough, our brains will find a way.

### **But What About Natural Talent**

- While those with higher IQ in skills such as test are dominant at the outset, “[i]n the long run it is the ones who practice more who prevail, not the ones who had some initial advantage in intelligence or some other talent. **Bilalic study**
- No one has ever found a gene variant that predicts superior performance in one area or another, and no one has ever come up with a way to, say, test young children and identify which among them will become the best athletes or the best mathematicians or the best doctors or the best musicians.

### **Where Do We Go from Here**

- A major difference between the deliberate-practice approach and the traditional approach to learning lies with the emphasis placed on skills versus knowledge—what you can do versus what you know. Deliberate practice is all about the skills. You pick up the necessary knowledge in order to develop the skills; knowledge should never be an end in itself. Nonetheless, deliberate practice results in students picking up quite a lot of knowledge along the way.

If you teach a student facts, concepts, and rules, those things go into long-term memory as individual pieces, and if a student then wishes to do something with them—use them to solve a problem, reasoning with them to answer a question, or organize and analyze them to come up with a theme or hypothesis—the limitations of attention and short-term memory kick in. The student must keep all of these different, unconnected pieces in mind while working with them toward a solution. However, if this information is assimilated as part of building mental representations aimed at doing something, the individual becomes part of an interconnected pattern that provides context and meaning to the information, making it easier to work with.

- The best way to help students develop their skills and mental representations in an area is to give them models they can replicate and learn from, just as Benjamin Franklin did when he improved his writing by reproducing articles from *The Spectator*. They need to try and fail—but with ready access to models that show what success looks like.