

THE STENOGRAPHIC BRAIN: A SUPERPROCESSOR

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- CHARACTERISTICS OF SHORTHAND
- LEARNING
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“The art of writing as fast as one can speak is the greatest triumph of writing.”
Karl Faulmann

Writing is one of the best inventions of man. And shorthand, according to Karl Faulmann in his book “Historische Grammatik der Stenographie – (Wien, 1887), is its highest triumph.

The common spelling uses letters of the alphabet. Joining letters and syllables it forms words, phrases, and will be forming a written line: there is linearity. Except for the dot over the letter “i”, the small stroke that cuts the letter “t”, the punctuation marks, the common spelling is performed almost without lifting the hand.

The shorthand writing differs significantly from the common spelling: it has unique characteristics. Shorthand symbols are usually derived from geometry: small horizontal strokes, verticals, oblique, small circles, pieces of circles, dots, half-lines, small hooks, sloping curves lines that will be joining and disunited, assuming different positions, sometimes on, below, or through the line, sometimes in the middle, sometimes in the front and sometimes behind. There is not, as in the common spelling, linearity. One raises his hand frequently. This often raising of hands tends to get imperceptible because of the speed and fluency on how one writes down in shorthand.

The shorthand is a graphic system that is governed in general by phonetics. Hence the shorthand name, a “phonetic writing.” In shorthand, each symbol represents a particular sound. A single symbol may have various sizes to differentiate the meaning of sounds. And depending on the place it occupies on the ruling (in the bottom or on the top, here or there) it will represent a specific sound. A symbol attached to another has a meaning sound, a sound meaning; separated, other. A simple space between two symbols may be

also a differentiated sound meaning. The differentiated determinant details of symbols and sounds vary from method to method.

➤ COMPACTING

A key attribute of shorthand writing is its compactness. Unlike the common spelling, extensive and slow, the shorthand is a system of graphic symbols that presses for being succinct, brief, and limited to the bare essentials.

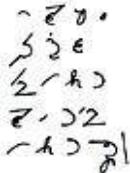
While the common spelling uses two, three or four letters (in some languages even more) to form a syllable, the shorthand performs an astonishing feat of using a single symbol.

In addition to the basic symbols, shorthand has the so called “special initial symbols” and “special terminal symbols” which compresses even more the already brief graphic system. That is, with just a shorthand symbol, we are able to abbreviate a set of spelling of common syllables. Example: a small shorthand symbol summarizes the termination “bility”.

The shorthand is then, for excellence the writing that compresses. It compresses into a single symbol, multiple initial and final syllables. And it achieves a greater compression rate when it summarizes whole sentences to a single shorthand symbol so called “conventional symbols”, “abbreviations”, “brief forms.”

Using a Data Processing term, we can say that the shorthand uses an audio-graphic “codec.” It gets compacted when shorthanded and decompresses at the time to translate. The phrase that was heard and compressed into a single shorthanded symbol will have at the time of translation that small decompressed symbol into a whole sentence.

The intensity of a compression is the one which makes sometimes a 120 word dictation per minute more difficult than others of 135 words per minute. At a 120 words per minute dictation, a sentence may be composed of many extensive words, which require more compaction efforts, meaning more symbols to be written down. Now a dictated sentence with a speed of 135, which contains large amounts of terminal symbols and special initials and brief forms will have a higher compression and, consequently, fewer shorthanded symbols to be translated.

The shorthand uses an audio-graphic “Codec” at the time of shorthand and decompresses at the time to translate		The shorthand uses an audio-graphic “Codec” at the time of shorthand and decompresses at the time to translate
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➤ SHORTHAND SYSTEMS AND METHODS

In the same way that there are various types of alphabets (Latin, Greek, Arabic, Cyrillic and etc.), there are also various shorthand systems. The most majority are called geometric systems (symbols taken from geometry). There are still the cursive systems and the mixed systems. Systems that use the alphabet letters are called alphabetic systems.

Each shorthand method is totally different. The symbols of each method, as well as the rules in which they are based, differ to such an extent with regards to the meaning of sound, that a stenographer of a particular method cannot read what a stenographer of another method wrote.

Going through the shorthand history, we noticed that the shorthand systems have evolved and its authors have always looked for greater simplicity, better layout, a better delineation, endeavoring to produce a more agile, flexible and effective system. In general, an author sought to correct system flaws of a system, creating a new one. Another author analyzed various systems, taking the best of each to build a new one.

That was the case of the Oxford professor, Samuel Taylor, called “The Father of the Modern Shorthand.” In 1786, having examined various shorthand systems, he created a revolutionary method for that time which became known as the Taylor System. Thus, Taylor expressed himself to talk about his decision to create a new system: *“In the course of my dedication to this study, I examined thoroughly over forty publications and manuscripts on Shorthand, some of them undoubtedly have their perfections; but there are none in which I am fully satisfied.”*

Hundreds of shorthand systems were generated from other systems since Tironian Notes (the first organized shorthand system – 1st Century B.C).

➤ SPACE MANAGEMENT

Another shorthand feature is the fact that, besides writing down the symbols on paper with speed and fluency, the stenographer will have simultaneously to manage his writing *space* because the lack of space administration in an appropriate manner could result in difficulties to understand certain symbols at the time of translation.

The importance of a careful space management is better understood when we know that the primary purpose of shorthand is the interpretation/translation. A symbol closer to the other than it is supposed to be, farthest, further down or further up will make a translation difficult. Therefore, at the same time that the stenographer writes in shorthand, he will care to build a visual map of each symbol on paper so that each symbol stays in place. This technique concerning space management is acquired at the same time as one goes on speed shorthand training and through the habit of translating everything written in shorthand. It is through translation that you will be able to see where an error was (spatial-graphic) and why there was a mistake. At this point, a shorthand reading has an important educational role in training, development and refinement of a shorthand apprentice.

➤ ACCURACY

Another big difference between the two writing systems (the common one and the shorthand) is related to the accuracy in which one writes. While regarding the common spelling it is not so necessary the perfection of the letters to a later understanding, in shorthand the stroke perfection is crucial. And that symbol perfection, that neat stroke design is learned, trained, developed and improved since the beginning of learning. It should be practiced and improved in each and every new dictation speed.

The stenographer will write down in shorthand and at the same time care for accuracy, tending to take a perfect stroke so it can be subsequently translated. There is in

particular, an *integrated processing* of the brain, which will take care of several things at once. This is a large and intellectual activity: listening, converting a listened sound into a graphic sign, look for perfection and correct possible errors or “data scrambling”, “inner viewing in his brain the shorthanded symbol” and, finally write it on paper. By writing a wrong shorthand symbol on paper, the brain realizes the error and the information is “returned” to the hand which fixes it in fractions of seconds, quickly erasing the error and writing down the correct symbol.

➤ THE SHORTHAND SPEED IS IN THE BRAIN

It is important to consider that the shorthand speed is in the brain and not, as many think, on the hand. It is in the brain that the shorthand symbols are developed. That’s where sounds are transformed into graphic signs. The hand will write down signal sent by the brain.

When the brain fails to “draw instantly” the sounds of a word, when there is a doubt the hand will lock in hesitation in drafting a shorthand sign. The graphic fluency is interrupted and one or several words are lost and the shorthand interpretation will be impaired.

Regarding the common spelling, the shorthand is not more difficult or less difficult to learn: it is just a different spelling system. Indeed, what makes the shorthand seem “harder, more complex,” is the shorter time of daily use that is made of shorthand. So, let’s analyze that topic.

As soon as a child is literate, he is soon plunged into a veritable ocean of letters. And as it grows studying, he is permanently in touch with reading and writing. He begins to read textbooks, storybooks, comic books, billboards, neon signs, advertisements, newspapers, journals, labels, etc. And it will stay in constant contact (a complete immersion) all day with reading and writing.

The development, progress and proficiency in reading/writing is permanently stimulated, as far as the learning subject has a huge arsenal of reading and writing placed at his disposal all day, every day, every month, year after year. The ability to read and write is perfected in a course of thousands of hours of practice. This total immersion in the alphabetic characters will give one a full command of reading and writing. And it comes to such a level of proficiency that to see for example, an advertisement one no longer spells it, one no longer reads letter by letter, word by word, but perceives the whole, understand the message in an instant. When one sees a bakery sign, one no longer reads the letters individually, nor the syllables: one grasps the global meaning in just a glimpse: *bakery*.

The stenographer contact with the shorthand (in relation to literacy in the common spelling) is minimal. It is minimal in volume, quantity and intensity. That little daily contact with the shorthand symbols, the lack of total immersion are undoubtedly the primary cause of “mental hesitation” when writing down in shorthand which hinders and delays the writing fluency, velocity and the reading fluency.

Let us do now with our imagination, a tour through a “shorthand city”, where everything is written in shorthand. You are born in this city and are “literate” in shorthand and since you were a child you see, you read and write everything in

shorthand. Books, magazines, billboards, notices, advertisements, comic books, shop signboards, dubbed movies, all written in shorthand! You spend months, even years just seeing shorthand symbols, and reading and writing with those symbols. It is clear that in such circumstances it will be eliminated once and for all the “mental hesitation” and you will have a total mastery on shorthand with a reading speed and an unimaginable writing fluency.

➤ ACHIEVING SHORTHAND SPEED

The achievement of speed is given step by step, grade by grade through a progressive dictated training. The training is a real “shorthand workout”, an intellectual exercise which matures, strengthening the brain’s ability to produce shorthand symbols increasingly instantly (simultaneity).

The achievement of shorthand speed demands practice, time and applied study. It is necessary to “digest thoroughly” each dictation, to get the best absorption. The words of difficult tracing and the conventional signs of each dictation should be relentlessly trained, systematically reviewed and concentrated several times today, tomorrow, for several days.

Shorthand is like this: the daily conquest of “small victories”. Each small victory will strengthen the motivation: and success generates success.

Referring to literacy, says Juvencio Barbosa in his book “Reading and Literacy”:
“Accordingly, the learning process consists, first of all of experience moments or familiarity, interspersed by systematic moments, targeted to observation, comparison, deduction, etc.”

It is interesting this approach to literacy in the common spelling, because that is exactly what happens to “literacy” of shorthand symbols. To get a familiarity with the symbols, it is essential a systematic study and training, it is necessary for the students to get involved in what they have learned in each lesson through symbols “observation, comparison and deduction.” It is with the systematic training that the students acquire familiarity with the shorthand symbols, and learn the outlines and union of the signs, learn to identify and decipher every word in shorthand. Only with exercises and applied study, the sounds converted into graphic codes can be deciphered, interpreted and translated by sense intuited.

➤ THE BRAIN AND THE SHORTHAND’S SYMBOL PROCESSING

Moving on speed training (more words added every minute), significantly increases the volume of data to be processed by the brain. It becomes an increasingly complex and intense intellectual activity! The more volume of data, more words heard requires faster construction of mental shorthand symbols, requiring larger doses of concentration.

Let’s compare the speed of thought of the same 20 words per minute text dictation to a 25 words per minute dictation.

At each speed there is an increase of mental work, especially at higher speeds, sometimes redoubling the time spent on the dominance of the previous speed. We can compare this to climbing a ladder and the more you climb, the larger are the steps, that

is to say, the greater becomes the distance (time of applied study) that you must endure to get to the next level.

It is interesting to note the volume of sounds converted into graphic codes (stenographic symbols) increasing, but at the same time compressing, in one minute time. It is worth to say, the more volume of processed data, the higher is the compression. Twenty words per minute, sixty words per minute – and, later one hundred words per minute! Not to mention the amount of shorthand symbols required for certain words with many syllables, which are written in shorthand with only the basic symbols, that is, without any special terminal and initial sign compression as the brief forms offer.

A daily practice demonstrates that to move from a high speed of 120 wpm to a 130 wpm requires more training time, increased amounts of dictation, greater dedication, more methodological study and more perseverance.

Using a term from Data Processing, we can say that each time the velocity grows, we do an “upgrade” in the brain areas responsible for all this learning, training and shorthand speed acquisition, those multiple simultaneous operations (hear the sound, turn it into a graphic symbol on the brain and carry it out on the paper by hand). We put a more powerful “processor” in our brain, a more effectively memory RAM. Thanks to that most powerful processor and that more effective memory RAM at each new speed, we mature, exercise a better dominance and we have a better performance in the art of shorthand.

This point is important to emphasize: at the same time that speeds are getting higher (90, 100, 120 wpm), more training time is necessary. There is a whole process of maturing, maturation that needs to be observed. As long as we train progressive speed dictations, we create new connections in our brain (synapses), which will gradually be adapted to this increasing volume of processed data. They are high-speed connections – in which speed is measured in words per minute. It is a stream of listened sounds, processed in graphic symbols in the brain and shorthanded on paper.

In the process of writing down in shorthand, the brain will send to the hand, so to speak, several instructions per second, catching in a great library (database), from a long-term memory, where they are stored in a huge range of basic signals, abbreviations and the initial and terminal signs. At high speed, this represents a gigantic information processing. This is a “high speed connection” (broadband), in which speed is measured by words per minute.

The more the stenographic signals are consolidated into a long-term memory, the more solid it will be for a retentive, faster that data will be sent, in which the brain converts the listened sound into a graphic symbol.

➤ THE APPLIED STUDY

Only a study of a medium to a long term engaging in a methodical and applied study, constant repetitions, dedication and persistence, which involves constant challenges to overcome and achieve the necessary maturity will increasingly eliminate the mental hesitation and increase the brain-hand “speed connection.” In an applied study, the stenographer would “refine” his shorthand basic structure knowledge (reinforcing

foundations), and improving little by little new levels of proficiency which culminates in a full skill development.

In the article “Bright Minds” by Philip E. Ross, from “Scientific American magazine, we find that passage very interesting: *“APPLIED STUDY is the key for success in chess, in classical music, football and many other fields. New research indicates that motivation is a more important factor than innate ability”*

And that article adds more: *“Motivation and intense training can also elucidate the exploits of famous child prodigies, such as the Austrian composer Wolfgang Amadeus Mozart and the American golfer Tiger Woods.”*

So, writing at high speed is something that is learned, acquired. But to get there it is necessary, then, more than innate ability, a great deal of motivation, dedication, patience and hard work. You must train hard to make the strategy work and produce results. Without a constant training (getting better each day), rising to higher shorthand speed is impossible as it is impossible for a pianist to perform a difficult great composer’s presentation without such repetitive everyday training. A quick and skilled stenographer’s mind and development skills are a training product rather than an innate ability. We must, therefore, practice, practice and more practice until reach “the boiling point” at each speed level.

The learning ability of shorthand is synonymous with a learning of motor skill development, a gradual development of a coordinated, reflex conditioning, automatic and accurate behavior. The progressive learning of this skill is reflected in the gradual increase in speed of brain-hand response. Gradually and increasingly as the stenographer (or the shorthand student) methodically practices speed dictations (technical training), he acquires what is the peculiar characteristic of shorthand: listening to and writing down simultaneously different speakers, different cadences and voice inflections and different rhythms.

About this acquired skill and their location in the brain, we can read the article “Learning Skills” by Larry Squire and Eric Kandel, in “Living Mind & Brain” magazine: *“After the task has been practiced for a long time, the prefrontal cortex, the parietal cortex and the cerebellum activities decrease, while the motor cortex and adjacent areas increase. The latter two regions may be those that with the neostriatum store information related to the long-term memory capabilities and allow the execution of fluent movements of acquired skills.”*

➤ MEMORIZATION

Both in the learning phase and the speed training phase, and in all shorthand activities, memory plays an important role. Throughout the study of shorthand, there is an ongoing exercise with the memory. This exercise becomes unmatched, as each new speed training requires from memory a faster work. Explaining this in a colloquial language, it is like saying that, in a dictation of 60 wpm, we give orders to the memory: “think and develop the signs at a 60 wpm speed!” In a dictation of 70: “now think and develop those signs even faster!” And so on...

There is logic in saying that the shorthand and memory retention are two terms that are complementary, because the shorthand is not conceivable without a permanent memorization exercise.

It is a fact that there are two types of memory: short-term and long-term. The short-term memory is transient, ephemeral. For it to become a long-term memory, called permanent memory, it is necessary a *repetitive practice*, or *smart mental associations* to help with memorization.

The so called “mnemonic process” is able to develop and facilitate the memorization, make such associations that the object to be stored is quickly fixed and indelibly in memory. All the mnemonic resources can and should be used in shorthand learning and speed training. The repetitive practice is unsurpassed for fixing in the *permanent memory*, the stenographic and conventional signs. It is an indisputable fact: the more deeply entrenched the stenographic symbols are in a *permanent memory*, the less hesitation there will be and more fluent and faster will be the shorthand writing down.

➤ TWO SPELLING SYSTEMS “TALK”

An interesting fact that happens often with those who are learning shorthand is to mentally writing in shorthand everything they see written on the street signs.

When a beginner or advanced shorthand student, walking or driving, looks at a street sign, he instinctively “mentally” writes in stenographic symbols what is written there. In fact, he practically reads in the new writing system he is learning (shorthand) what is written in the spelling system he already knows (the common spelling). It is as if the two spelling systems “talked among themselves.”

The reason is easy to explain. As the student is engaged in learning a new spelling and his brain is involved in learning, he begins to mentally practice the new spelling and make comparisons with the previously learned spelling.

It is interesting to note the more a student is motivated in learning shorthand and the more he is applied in this study, the greater the “conversation” degree between the two spellings will be. There are students that upon reading a word on a sign, they usually write that word mentally, to a point of getting movements with their fingers in the air, as if they were writing in shorthand.

This “conversation” between the two spellings is beneficial and efficient for learning. That indicates the highest degree of desire and engagement a student has to learn a new spelling.

➤ MOTIVATION AND JOY OF VICTORY

Great musicians, athletes and professionals whose activities require high levels of skills, ability, mastery, proficiency and expertise acquire such skills through motivation and mainly through applied study. Driven by competition, by the desire for success and the joy of victory, they spare no efforts to achieve their goals, studying with great passion, training hard, doing their tests with dedication, training hard every day, weeks and months. They usually spend several hours a day training to get to the highest level of a skill.

That may also happen with the one who is learning shorthand, because it counts less on the innate gift and more on the continued and applied study, the goal, the self-stimulation, the intuition, the target setting, the concentration, the care of each detail, the

exercise done with care, attendance discipline, regular training attendance, the recycling, the relentless repetition, the regular everyday study. Thus, they acquire the knowledge and practice of each lesson, the maturation on each learning level, competence is achieved at every level of shorthand speed and, little by little, the experience, the subtleties and secrets of the art of shorthand.

➤ **THE EXTRAORDINARY VALUE OF SHORTHAND**

As a brain exercise, the shorthand has a unique value. That is a unique exercise in attention and mental agility. It develops coordination and motor response. It sharpens the intelligence. It exercises the memory. It cultivates and stimulates rapid and precise decision, perception and discernment. It develops a high degree of concentration ability. It develops an interpretive skill and increases the ability to hear nuances.
