PART II

ILLUSTRATION :

THE OPTIMIZATION OF MY SPECIFIC REHABILITATIONS

PART II - ILLUSTRATION :

THE OPTIMIZATION OF MY SPECIFIC REHABILITATIONS

- Review
  Chapter A

- My specific rehabilitations
  Chapter B

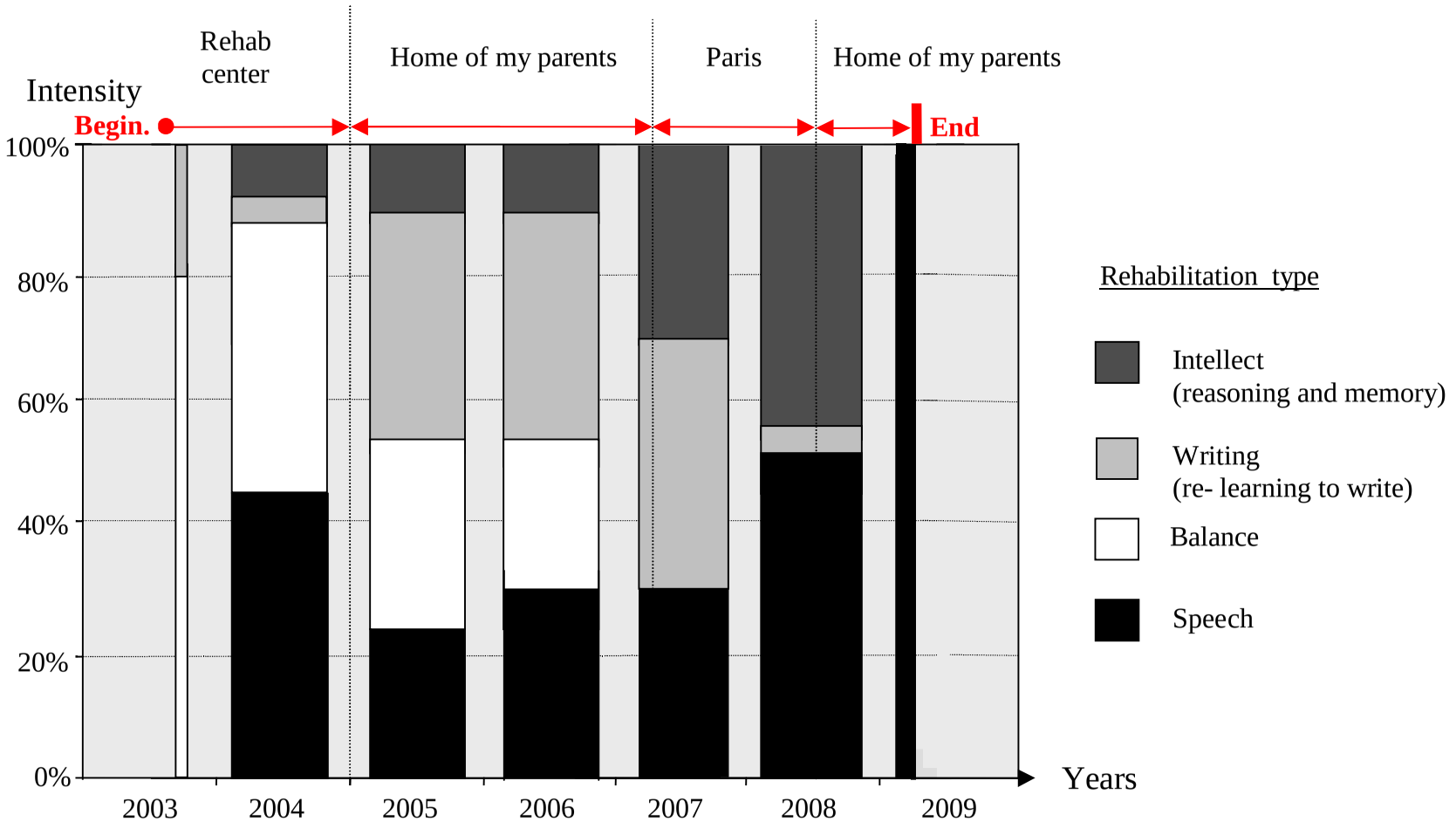
- Post-task comments
  Chapter C

Part II illustrates the rehabilitation method through applications to each of my specific rehabilitations (rehabilitations in particular areas).
In addition to its illustrative purpose, it may give you ideas if you have a rehabilitation case very similar to one I had. If you are not in this case, I suggest you read well only chapters A and C, and skim over chapter B.

To facilitate the possible adaptation to your rehabilitation case of exercises I practiced, I try to present them clearly :

- **Description**
- **Practice** : time period, and rhythm, of use
- **Personal use** : characterization
- **Rehabilitational benefit(s)**

Intensity of my specific rehabilitations



Rehabilitation time :	1.5 month	Year 1	Year 2	Year 3	Year 4	Year 5	1.5 month
						- 8 months -	

A. REVIEW

Two points about this review :

- I followed during my recovery an experience curve of 3 to almost 5 years according to a given specific rehabilitation.
  So, I can think about it in **an informed manner**.
- I do not need to carry out a specific rehabilitation any more.
  So, I can think about it in **a detached manner**.

While I was carrying out my specific rehabilitations, I was not able to detach myself from them. I spent a major part of my time thinking about possible rehabilitation exercises, and executing them as well as possible.

Each of my specific rehabilitations is no longer a distant goal, but an achieved job, the execution quality of which I analyze after the fact.

1. Length

The figure on the previous page summarizes the conduct of my specific rehabilitations over the years.

It shows their respective place in my overall rehabilitation intensity (personal involvement in rehabilitation), not the time devoted to them.
There is between these 2 elements a strong, but far from perfect, correlation. I illustrate this as follows : the handling in 2006 of balance rehabilitation by a specialized physical therapist was very efficient. However, since I was in charge of a specialized paramedical therapist, I needed less personal involvement, so less rehabilitation intensity.

This figure shows I continued each of my specific rehabilitations well after my departure from the rehabilitation center in December 2004.
Indeed, my physical situation when I left it was incomparably better than when I had arrived, but not at all sufficient to live fully.

The overall length of my rehabilitation is 59 months (approximately 5 years), from mid-November 2003 to mid-February 2009 with 4 months without rehabilitation from April to July 2008. The most important length of a specific rehabilitation is that of my speech rehabilitation, 4.5 years. The overall length of my rehabilitation is greater than this length because I began specific rehabilitations in a spaced out fashion. The latest one, that of speech, began in March 2004.

2. Optimized rehabilitation necessarily implies "rehabilitatory innovation".

Rehabilitatory innovation is a cornerstone of optimized rehabilitation. It plays such a role because in this rehabilitation mode, as exposed in I.A. and I.B.d. of this book :

- Rehabilitation temporarily is the reason of life (for you to live fully thereafter).
- The rehabilitatee will innovate because she HAS to.
- Only one rehabilitation case, the treatment of which requires absolutely no medical knowledge, matters to the one who rehabilitates : hers.

Therefore, you will find rehabilitation exercises adapted to your unique rehabilitation case : as it is unique, it often cannot be treated at best by generic exercises.

As a proof of what I write, the table herebelow shows the role played in my rehabilitation by therapy sessions and personal means :

Rehabilitation origin

Specific rehabilitation	Origin	
	Therapy sessions	Personal means
Balance	**70%**	30%
Speech	35%	**65%**
Writing (relearning to write)	15%	**85%**
Intellect	8%	**92%**

Personal rehabilitation means play an important role in each case and, in 3 out of 4 of them, are the origin of the major part in rehabilitation. Of course, the "personal rehabilitation means" index does not necessarily imply innovation; in one case, the rehabilitation of intellect, there was rigorously none. However, for other specific rehabilitations this index is an acceptable proxy for innovation.

The table above shows that in several cases *I could rehabilitate only thanks to innovation*; it was necessary to treat my unique rehabilitation case :

- Speech rehabilitation would not have worked without an original speech rehabilitation mode (= exercises and regimen), "Pure Speech Rehabilitation".
- Writing rehabilitation (re-learning to write) would not have worked without substitution (from manual to electronic writing).

I innovated rehabilitatorily. So will you.

1. Large savings of time and effort are possible

During my entire rehabilitation I tried to make each specific rehabilitation as swift as possible; however, I needed almost 5 years to rehabilitate.
This great length of time is due to :

- The fragmentation of my rehabilitation efforts between specific rehabilitations.
- The gap between my initial physical state and my rehabilitation goal.
- The discovery of powerful rehabilitation means only during rehabilitation.

Had I known those means before recovering, they would have significantly shortened some specific rehabilitations :

- Balance : - 40% / - 50% (physical therapy specialized in balance).
- Speech : - 15% / - 25% ("Pure Speech Rehabilitation". The impact of it is not greater because, aside from injuries in the cranium, I faced several physical problems).
- Writing (relearning to write) : - 40% / - 50% (substitution of electronic writing for manual writing).

2. My rehabilitation tasks taught me the value of time for rehabilitation

Type and length of specific rehabilitations

	TYPE			
	Equilibrium	**Speech**	**Writing (re-learning to write)**	**Intellect**
Rehab. domain	Mostly phys. therapy	Speechwork and personal rehab	Occupational therapy and personal rehab	Neurological rehab and personal rehab
Beginning	Mid-November 2003	March 2004	December 2003	January 2005
LENGTH	**3 years**	**4 years 6 months***	**4 years 3 months****	**4 years 5 months****
End	November 2006	Mid-February 2009	May 2008	July 2009

* Four months without speech rehabilitation in 2008.
** Two months without intellectual or writing (re-learning to write) rehabilitation in 2008.

The table above shows that each of my specific rehabilitations was very long. Time enabled me to devise new rehabilitation means, or to do a substitution when I thought I could not rehabilitate further.
I do not think rehabilitation time ought to be viewed as a fixed quantity. On the contrary, I did my best to shorten each specific rehabilitation as much as possible.

Nonetheless, I think a rehabilitation MUST last a long time, for :

- ***Repetition* enables exercises, if their quality is good, to have a rehabilitation effect.**
- ***Adaptation of the body*, very slow, adjusts it to the physical situation resulting from your accident.**

5. Two characteristics to manage : uncertainty and difficulty

Each specific rehabilitation aimed to allow me to rehabilitate as completely as possible. I had to rehabilitate so, because I did not want to suffer during my life from a lack of rehabilitation I should have carried out. If I rehabilitated so, I would have no remorse.

All my specific rehabilitations share 2 features :

- Uncertainty

  I carried out each of my specific rehabilitations in complete uncertainty over its rhythm and its term, for I could not master either.
  I taught myself to carry it out despite this uncertainty :

  - Rhythm : I tried to make it as high as possible.
  - Term : I did my best not to think about it.

- Difficulty

  Each specific rehabilitation was difficult until its end.
  This characteristic proceeds from a low starting point in each case.

But I reached a satisfactory term for each of my specific rehabilitations, and a life segment I will enjoy living lies in front of me.

B. MY SPECIFIC REHABILITATIONS

Next 40 pages.

1. Equilibrium

Rehabilitation thanks to therapy sessions : 70% - of which, at the center, 40% - Personal rehabilitation : 30%

Summary

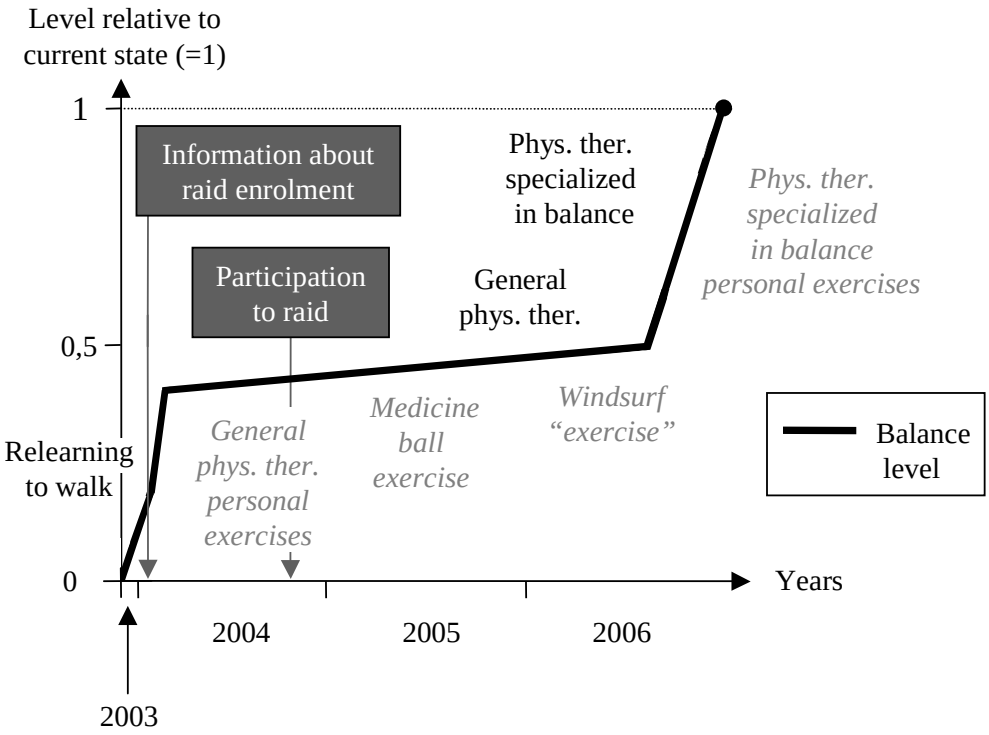
INITIAL SITUATION		**Balance almost absent**
Cause		Destruction of half the cerebellum owing to a high pressure in the cranium (the cerebellun is an organ in the cranium that manages coordination, therefore balance).
REHABILITATION MEANS	Ther. sessions 70%	1. General physical therapy in the rehabilitation center. It enabled me to relearn to walk. 2. General physical therapy private practice. 3. Physical therapy specialized in balance. Thanks to it, I completed my balance rehabilitation.
	Personal 30%	1. Relearning to run and to do all motions. (origin : enrollment by a close friend in a raid when I was in a coma) 2. Practice of physical therapy exercises : - exercices on an "equilibrium board" replicated from that of the rehabilitation center - exercices on a trampoline 3. Rehabilitation exercices with a "medicine ball" sent by my Dad. 4. Practice of exercices of physical therapy specialized in balance. 5. Windsurfing with a close friend. 6. Life in a non-protected enrionment, "real life".
Duration		3 years
FINAL SITUATION		**Balance recovered**

Initial situation

My balance was almost absent (but not entirely absent, I could for instance sit up straight).

I did not know if it was permanently almost entirely absent, or if I could recover it. Nobody told me. Since I never thought my loss of balance was irreparable, I did not ask anyone anything, and worked to regain it.
I moved in a wheelchair for a little less than 4 months, from the first half of November 2003 to the end of February 2004. An auxiliary nurse pushed me until the end of December 2006.

Rehabilitation curve



General considerations

My loss of balance was the major consequence of a coordination trouble that affected my whole body. This coordination trouble due to my damaged cerebellum could not be taken charge of by a rehabilitation in particular. It was solved :

- in part, thanks to my rehabilitations of equilibrium (balance capacity), speech and writing (relearning to write)
- in part naturally over the course of time, thanks to the motions generated by my other activities

Coordination rehabilitation took the form of the creation of new neurological connections in the still active part of the cerebellum.
After a trimester my coordination troubles almost only applied to my hands, but they were very marked during the first weeks.

During this period, I could not swallow certain drinks, such as milk. So, I had in December 2003 a "swallowing" medical appointment (I do not know the medical name of the appointment). I could not yet speak comprehensibly, so my Dad told the physicians what I garbled. I could use a fork at end-2005 (until then, I ate with a spoon). I could use a knife in mid-2006.

After I had relearned to walk, my poor equilibrium caused numerous problems, and did not enable me to do any activity marked by a strong continuous imbalance. Such an activity is for instance running or walking down a staircase without holding its ramp. Unbeknownst to me before the accident, the latter requires a fine control of balance I did mo longer have; therefore, a staircase without a ramp was insurmountable to me.
At the beginning, I walked like an old sea dog and a penguin combined, that is with my legs a little spread apart and my feet slightly outward-facing, in order to enlarge my "support polygon". My improvement in balance enabled me to progressively draw my legs closer and to place my feet in the direction where I was going.
Until physical therapy specialized in balance, I was not able to turn my head without this movement resulting in a general unsteadiness.

Paramedical rehabilitation means

Note : for this specific rehabilitation and all others except that of speech, I write in months under each exercise the time of practice from my arrival in the rehabilitation center.

- **Physical therapy of the rehabilitation center**

  Months 2-13 - Daily half-hour session

After a few weeks in the rehabilitation center, I was carried on a stretcher to physical therapy sessions, for a reason I do not remember.
After a few days, the physical therapist I daily saw determined I could rehabilitate some equilibrium (he did this with high professional skills, but I do not know how). As a consequence, from the end of November 2003 he taught me to walk again.
For this relearning, I put my wheelchair between parallel bars and pulled myself, then supported myself with these bars and relearned to move my legs. At the beginning, I had to maintain my arms rigid, because I could not control my legs to support me.

I did many exercises to relearn to walk on a flat surface, then in February 2004 I relearned to walk on stairs. The physical therapist held me with a strap, but despite his support it was really a difficult exercise. During one of the sessions on stairs, I soaked my pants with urine, because my penal sheath had been torn off by my movements and I was too absorbed by the exercise to notice this.

On March 1st I could leave my wheelchair and walk, at the beginning with a cane. It helped me have better balance through the enlargement of my “support polygon”.
Balance improvement until I could walk had required 4 months. I had relearned to walk, but could not do any physical exercise that required a fine control of balance.

All the time I was in the rehabilitation center, I continued to daily execute rehabilitation exercises; they resulted in clear, but weak, balance improvements. It is only with physical therapy specialized in balance that I made again very important balance improvements.
When I left the rehabilitation center at the end of 2004, my balance was still poor. My movements were still a little jolty until the end of 2005, and were marked by stiffness until the end of my balance rehabilitation in November 2006.

- **General physical therapy (private practice)**

  Months 27-29 - Weekly session

In spring 2006, more than a year after I had left the rehabilitation center, I was very unsatisfied with my balance improvements. So, I followed a series of sessions with a general physical therapist. I had not done so previously, for I was rehabilitating balance on my own; in addition, I was much too occupied with my other specific rehabilitations not to consider too important the time-cost surrounding sessions. Equilibrium improvements thanks to these general physical therapy sessions were very weak. I did not know anymore what I could do to significantly rehabilitate my balance.
Thankfully, my birthday present presented hereunder made me discover shortly afterward physical therapy specialized in balance.

- **Physical therapy specialized in balance (vestibular physical therapy)**

  Months 31-35 - Weekly session

For my birthday, my sister invited me at the beginning of summer 2006 to the Vercors (a mountain range west of the Alps). Her birthday present was a week-end of sport activities with her, under the guidance of a middle-altitude guide. The wife of this guide is a physical therapist. I asked her questions, and she informed me of the existence of a physical therapy specialized in balance : vestibular physical therapy.

I found a physical therapist specialized in balance, and made appointments. Initially, I thought he was a kind of guru. I had this feeling, because at his practice I did not do any of the rehabilitation exercises I had done until then in physical therapy and the exercises I did were sometimes a little strange. The exercise I did most often was to look, standing upright in a dark room, at the points of light sent on a wall by a rotational perforated ball containing a lamp.
He questioned me about the part of the cerebellum the accident had damaged. I understood then that my balance problem had not been permanent because the localization of damages in the cerebellum enables the creation of new neurological connections.

In fact, this man was not at all a guru but a specialized physical therapist who specifically treated balance problems. He rehabilitated my equilibrium directly into my brain.
Thanks to him, the rehabilitation of my balance was swift and very consequent. I ended it between June and November 2006.

Personal rehabilitation means

- **Goal to participate in a raid**

  Month 3 : information about my enrollment in a raid. Month 10 : participation in the raid

It is not a personal rehabilitation means, but a concrete goal with a relatively close date that drove all my initial balance rehabilitation.
While I was in a coma, a close friend called Julien enrolled me in a raid (a raid is an amateur team sport event that combines orientation running, kayaking and mountain biking. It lasts from half a day to a week). At the beginning of January 2004, while I was in a wheelchair but relearning to walk, he cycled on a mountain bike to the rehabilitation center to inform me of my enrollment; the raid took place in October. My possible participation to this raid enormously motivated me to relearn to walk. So, during the physical therapy sessions that followed the announcement of my enrollment, I was hyper-concentrated and never rested.

Beyond this enrollment, Julien took direct charge of my balance rehabilitation through the physical activities he had me do.
At the beginning of April 2004, that is a month after I had relearned to walk, I went to his house and asked him to look at me while I would try to jog. I managed to, albeit very slowly, protected by roller knee pads and gloves. From this day onward, I regularly jogged with Julien, slowly at the beginning. From May 2004, I relearned with him to cycle. At the beginning, I fell often due to my still very weak balance. However, since I had a lot of protections (the hard plastic mountain bike downhill suit of Julien, helmet, gloves, knee-pads and elbow-pads), my falls were not a problem, and I relearned to cycle.

In mid-October, I was able to participate in the raid in which Julien had enrolled me. A friend, Minh Minh, formed with me the team necessary for the raid. I could do everything except the final orientation run in the forest, for which my balance was still insufficient.

- **Physical therapy of the rehabilitation center**

  Months 5-14 - 20 minutes daily

When I had relearned to walk, I redid alone in physical therapy the equilibrium rehabilitation exercises I had just practiced with my physical therapist.

- **Equilibrium board**

  Months 6-15 - Half an hour daily

I replicated the rehabilitation board of the rehabilitation center, and exercised on it every morning after my waking up.

- **Stability on trampoline**

  Months 16 - 26 - 15 minutes daily

Following my gleaning of information on equilibrium exercises, I thought a trampoline could be an efficient rehabilitation tool. So, I bought a small one in a sport shop. I exercised on it every day, holding on to a rope I had stretched.

- **Medicine ball**

  Months 30-35 - 15 minutes daily

I had to catch a medicine ball thrown by my Dad, without moving anything other than my torso. The weight of this ball had me make equilibrium efforts.

- **Personal vestibular physical therapy exercises**

  Months 32-36 - Half an hour daily

When I began vestibular physical therapy, I asked the physical therapist the rehabilitation exercises I could practice alone. He answered he would be pleased to indicate such exercises to me, but I needed a specific board to do them. So, I went to a shop for physical therapists and bought the model of board he had described. Then, I exercised on it every morning after waking up.
The outgoing vestibular physical therapy check-up indicated a 100% rehabilitation of balance. I thought this value applied only to balance rehabilitation patients, not to all people. In consequence, I went on for a month doing personal exercises.

- **Windsurfing with a close friend**

  Month 33 - Daily practice for two weeks

A little before summer 2006, I sent an email to all my friends to ask whether I could go on holiday with one of them. Actually, I felt the need to go on holiday with a friend, so as to be distracted from all my thoughts revolving around rehabilitation. In doing so, I would de-saturate from it.
A close friend, Francois-Regis, suggested I go on holiday with him. He usually windsurfs on holiday, but put forward a hike in order to spare my weak financial means. However, I chose windsurfing, for it seemed a very good way to exercise balance through stability efforts.

It was, and I spent much time in the water. In order to minimize the number of falls, I had to navigate under a light wind, not to fill the sail fully, on calm water, and to hold the mast absolutely upright.

- **Life in a non-protected environment, "real life"**

I did not adapt my lifestyle in any way to my weak balance.
My opposition to any adaptation admittedly was not without difficulties, but led me to do everything I could to solve them rather than to try to dodge them.

The search to solve each physical problem, rather than the attempt to avoid its negative consequences, resulted in each of my specific rehabilitations.
It reflected my refusal to adapt to a situation I wanted only temporary. So, each difficulty led me to increase my reflection and my efforts on my body.

Physical therapy specialized in balance enabled me to finish to rehabilitate my balance as soon as November 2006.
From then on, I had only 3 simultaneous specific rehabilitations : speech, writing (relearning to write) and intellect.

Final situation

Balance recovered.

2. Speech[1]

Rehabilitation thanks to therapy sessions : 35% - of which, at the center, 8% - Personal rehabilitation : 65%

Summary

INITIAL SITUATION		**Speech almost incomprehensible** *Nil ability to communicate*
Causes		1. Tongue sheared, then sewn back. 2. Lower jaw completely broken, then reformed. 3. Cerebral Vasculary Accident (CVA) 4. Damage to the cerebellum, which modulates speech.
REHABILITATION MEANS	Ther. sessions 35%	Sessions with speech therapists I, II and III : - elements regarding my rehabilitation case - exercices
	Personal 65%	1. Flexing tongue while watching movies. 2. Writing my own speech rehabilitation words and phrases. 3. Reading books, magazines and my bedside book, out loud. 4. Singing karaoke songs. 5. Using for a period the internal house function of the house phone for speechwork sessions. ***"Pure speech rehabilitation" rehabilitation mode*** 6. Reading **theatre plays** out loud. ➔ *Relearning many tones and several articulations.* 7. Reading **poems** o.l.. ➔ *Relearning many speech sounds and most articulations.* 8. Reading **t. twisters,** and sentences with the **still missing sp. sounds, out loud**. ➔ *Completing speech sounds relearning.* 9. "**Controlled**" reading of texts o.l.. ➔ *Regaining complete control of speech amplitude.* 10. Reading **homophone verses** o.l.. ➔ *Working finely on speech sounds expression.* 11. Reading **complex phonetic sentences** o.l.. ➔ *Working finely on artuculations expression.* 12. Reading **speeches** o.l.. ➔ *Completing control of breath use, and regaining "normal" speech.*
Duration		4 years 6 months
FINAL SITUATION		**"Normal" speech**

[1] Appendix B presents the material used for the final phase of my speech rehabilitation that is on the passive website of the OYR! project

Initial situation

My speech could scarcely be understood. It was :

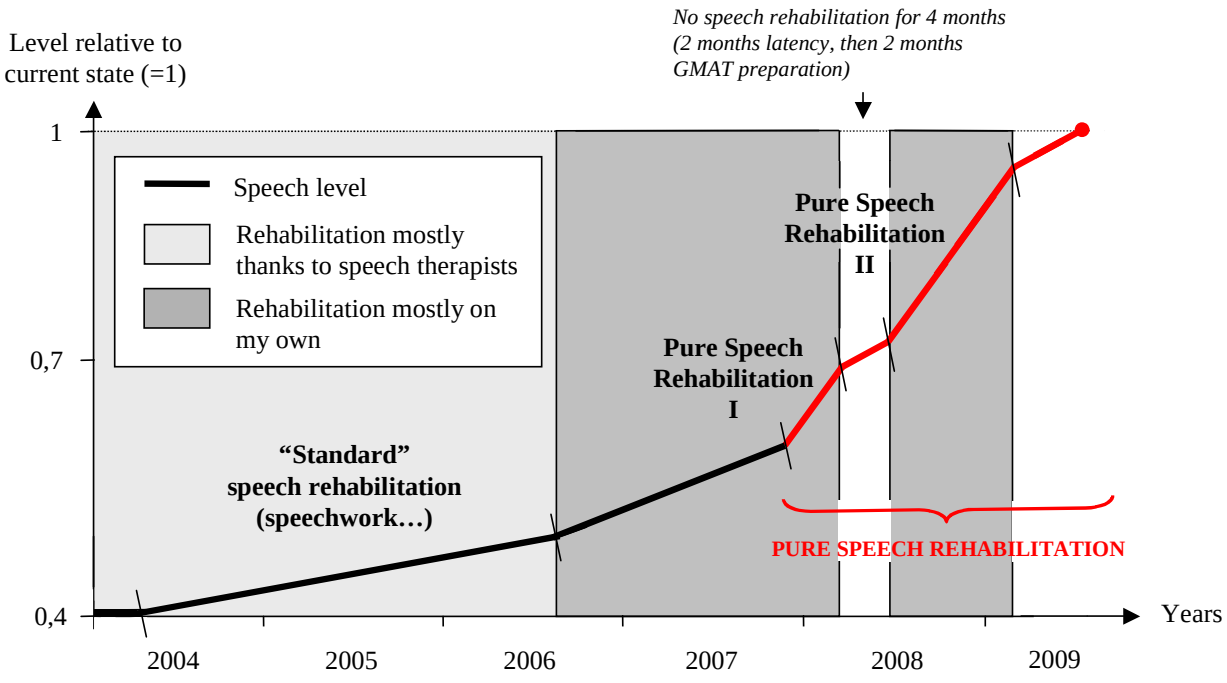
- filled with holes, because I had "unlearned" many speech sounds
- weakly articulated, because I no longer knew many articulations (which are speech sounds combinations within or between words)
- completely monotone ("unitonal"), because I could not express tones
- of sometimes irregular amplitude (volume and aptitude to set tones)
- very slow
- "chopped", because I had to breathe every few words

Four causes explain this state of speech :

1. Moderate CVA, resulting in dysarthria
2. Damaged cerebellum
3. Damaged tongue
4. Damaged jaws

I specify "moderate" for my CVA because I visited, to help him and to motivate him for his rehabilitation, the father of a close friend who had also recently had a CVA. I then realized that my speech problems were much less serious than his : I managed to speak although I had to struggle to make myself understood, but he had to completely relearn to speak, he had to learn how to pronounce each single speech sound again.

Rehabilitation curve



The rehabilitation curve strongly rises only with my own handling of rehabilitation without a speech therapist. This handling alone took the form of "Pure Speech Rehabilitation".
The curve does not show progressively diminishing returns. On the contrary, returns strongly increase over time, a phenomenon I clearly felt.
This profile surprised me, then I found possible explanations :

- Speech rehabilitation was autonomous only at approximately its 5/8th. Once the speech therapists had taught me its principles, autonomous handling of rehabilitation was of much higher intensity, so more efficient, than when I could fall back on them.
- The initially very heavy rehabilitation work became lighter over time, so the "effective rehabilitation/rehabilitation effort" ratio increased.
- I needed as a patient to follow a long rehabilitation "learning curve", before I could devise very efficient exercises.

My speech goes on markedly improving 9 months after my speech rehabilitation ended.
This improvement results from the very strong latency effect detailed on page 89.

General considerations

I try here to present clearly my speech rehabilitation work. This presentation may conceal I rehabilitated speech in "deep fog" and complete uncertainty.

Rehabilitation causes : speech problems originating in injuries in the cranium, and in other physical injuries

- **Speech problems originating in injuries in the cranium : dysarthria (neurological speech problem) due to the damaged brain, and hurt cerebellum**

  I solved them thanks to **"**Pure Speech Rehabilitation", during the second phase of which I **"**trimmed" then **"**polished" my speech (these terms refer to the parallel presented on page 94 between my rehabilitation from dysarthria and the creation of a distinctive necklace).

- **Speech problems originating in other physical injuries**

  Their impact on my speech was lesser than that caused by injuries in the cranium, but important. The scarred (and therefore stiffened) tongue, the slanted palate and the lack of teeth resulted in severe speech impediments.

Conceptualization and practice

Regarding conceptualization, I analyzed numerous speech problems and worked out personal exercises to treat them.
Regarding practice, I executed exercises in places perhaps a little unusual for speech rehabilitation such as in front of the TV or the computer, in a W.C.... or during my daily travels.
As far as daily travels are concerned, I needed during the first stage of my rehabilitation to flex my tongue; this task was not loud or technical. So, I executed tongue flexing exercises whenever I moved : taking the suburban train or the underground, and walking in the street. Since my mouth was closed during these exercises (pressures against the palate, horizontal movements...), nobody around me could notice them.

Rehabilitation time length

My rehabilitation was very slow, because it was very vast. At its term, I did not want to show I had rehabilitated my speech.
In that way, the person I would talk to would focus on my message, not on my speech.

Complete non-representativeness of close ones for the evaluation of speech level

Members of my family and friends never referred negatively to my speech.
That they did so is very good, because I preferred they do not highlight my poor elocution (oral delivery). **However, I had to realize that these persons are not at all representative for the comprehension of my speech. The goal of its rehabilitation was to live again in society, not to stay in the rehabilitation field**.
These persons told me things such as “You have a 90% level” or “Some people speak worse, such as people who have a lisp”.

Thankfully, the friend of a close friend and a friend told me : “If you work for my company, you will have a seriously handicapped person job” and “If you talk like this in a job interview, you will be torn to pieces”.
I sincerely thank these persons for having told me the truth, for having made my speech handicap appear so clearly.

Paramedical rehabilitation means

I had speechwork sessions with 3 speech therapists :

- “Speech therapist I”, a speech therapist in the rehabilitation center.
- “Speech therapist II”, a liberal speech therapist who gave me sessions at the home of my parents.
- “Speech therapist III”, a Parisian liberal speech therapist.

Personal rehabilitation means

Speech rehabilitation is the specific rehabilitation where I invested myself most.
I detail hereunder how I treated it so some of its elements may possibly be used by you.

I solved my speech rehabilitation case. For yours, please ask your speech therapist if any idea presented in this section is worthwhile for your rehabilitation. She will indicate whether it is the case.

Speech rehabilitation is very tough. Do not spend time and energy on rehabilitation exercises insufficiently efficient for you. Your following by a speech therapist will prevent this from happening.

My rehabilitation was made possible by a constant evolution of it. Exercises were at first "generic", then increasingly "specific".

Rehabilitation needs

The table on page 80 that summarizes my rehabilitation details 7 rehabilitation needs (➔ "rehabilitation focus"). However, 2 needs caused 70% of the volume of my rehabilitation :

- **Need n°2 to relearn certain speech sounds.**
- **Need n°3 to relearn certain articulations.**

Needs n°6 and n°7 resulted from them. Need n°4, the regaining of control on speech amplitude so that I can speak with an even tone, resulted from my damaged cerebellum. Need n°5, the necessity to relearn to express any tone (joy, surprise...), was also due to my damaged cerebellum. Need n°1, tongue-flexing, was of major importance during the initial 2.5 years of rehabilitation. However, my rehabilitation efforts made this problem decrease then disappear.

Speech rehabilitation structure

1. Period of basic rehabilitation

This period comprises tongue flexing, part of the relearning of speech sounds and articulations, part of the regaining of speech amplitude control, and part of the relearning of the expression of tones.

It numbers 3 phases :

- *Standard Speech Rehabilitation I* - 9 months
- *Standard Speech Rehabilitation II* - 27 months
- *Standard Speech Rehabilitation III* - 9 months

I personally handled my rehabilitation, but I could never have carried it out without the speech therapists in charge of me.

2. Period of fine rehabilitation : "Pure Speech Rehabilitation", ending with the "trimming" and "polishing" of my speech

I carried out mostly on my own this second period of rehabilitation, but I executed the first step of *Pure Speech Rehabilitation II* in great part thanks to speech therapists II then III.

It numbers 2 phases :

- *Pure Speech Rehabilitation I* - 3,5 months
- *Pure Speech Rehabilitation II* - 6,5 months

Pure Speech Rehabilitation II was executed in 2 steps :

- First step
- Second step

The second step was executed in 2 parts :

- ✓ First part
- ✓ Second part

The table overleaf summarizes my rehabilitation.

Speech rehabilitation summary

Basics rehabilitation *Fine rehabilitation*

Rehabilitation phase number and name		1 STANDARD SPEECH REHBAILITATION I	2 STANDARD SPEECH REHBAILITATION II	3 STANDARD SPEECH REHBAILITATION III	4 PURE SPEECH REHABILITATION I	5 PURE SPEECH REHABILITATION II
Living place		Rehabilitation center Months 1-9	Home of my parents Months 10-36	Paris Months 37-45	Paris Months 46-48.5	Home of my parents Months 48.5-54
Duration (months)		9	27	9	3.5	6.5
Daily rhythm		10h	3-5h	3-5h	10h	10h / 4 months then 6h40 / 2.5 months
Rehabilitation focus	1	Tongue flexing	Tongue flexing	Tongue flexing	Good tongue flexibility	Good tongue flexibility
	2	Releaning speech sounds	Releaning speech sounds	Releaning speech sounds	Releaning speech sounds	Releaning speech sounds
	3		Releaning articulations	Releaning articulations	Releaning articulations	Releaning articulations
	4		Controlling amplitude	Controlling amplitude	Controlling amplitude	Controlling amplitude
	5			Releanning tones	Releanning tones	Releanning tones
	6				Releaning speech speed	Releaning speech speed
	7					**Adv. relean. of sp. sounds**
Paramedical following		Speech therapists I then II, 2 sessions a week	Speech therapist II, 2 sessions a week	Autonomous work	Autonomous work	First month sp. ther. II, 4 following months sp. ther. III, 1.5 last month autonomous work
Major rehabilitation consequence		**Tongue part. flexibilised**	**Relearning some sounds/articulations**	**Relearning some tones**	**Relearning many tones and breath mgt. in speech**	**Regaining "normal" speech**

2.1. PRINCIPLES

a. Quality-quantity couple

Quality

The quality of rehabilitation exercises was maintained as high as possible by way of their continuous adaptation :

- First 2 years : essentially tongue flexing, then partial relearning of speech sounds and articulations.
- Following 1.5 year : essentially partial relearning of speech sounds and articulations, and partial relearning of tones.
- Last year : final relearning of speech sounds and articulations, and relearning :
    - modulation of speech amplitude, partially relearned from year 2
    - tones, partially relearned from year 3
    - breath management in speech
    - fine and very fine expression of speech (speech sounds and articulations)
    - "normal" speech rhythm

  The "Pure Speech Rehabilitation" rehabilitation mode detailed below made this last year particularly efficient.

I wrote an ever-increasing part of the words then sentences, so they :

- correspond exactly to my rehabilitation case
- be the most efficient possible
- motivate me (I tried to make them rather funny)

At the beginning, I spoke too poorly to pronounce anything other than very simple expressions. For instance, for the relearning of the "ch" speech sound : "Le monchu va à Chamonix" (*The urban tourist goes to Chamonix).*

However, before I executed any new rehabilitation exercise, I always asked my speech therapist what he thought about it. I did this because he had followed specialized studies to learn speech, and practiced speech rehabilitation as a professional. As for myself, I thought about my rehabilitation case, had rehabilitation ideas, but did not know their value for the improvement of my speech.

Quantity

Quantity never was an absolute quantity, but was the maximum quantity repeatable daily over a long time period.
It should not be a sort of "record", completely useless for rehabilitation, and even harmful to it due to its energy cost.

I increased the rehabilitation time length advised. For instance, Speech therapist I advised me to exercise 20 minutes per day, but I exercised 10 hours in year 1 and part of year 5, so 30 times more.
However, a presentation of my rehabilitation focusing on quantity would be entirely inadequate, for quantity was just the expression of quality. I was the one handling my speech rehabilitation and was responsible for its quality; speech therapists were specialized consultants to whom I had recourse.

b. Principles and examples of personal exercises

Rehabilitation exercises derived from my paramedical following

Personal exercises were *in no way* substituted for those my speech therapist had given me; as a matter of fact, I would have been stupid to replace the work of a specialist who was helping me solve my rehabilitation case !
During the first 3.5 years, my speechwork exercises were most often derived from those of a speech therapist. They had one of 3 purposes :

1. adapting an exercise as well as possible to my rehabilitation case
2. enhancing it
3. doing other than it

Other rehabilitation exercises

- **Watching movies to enable tongue flexing**.

  Reasons for the exercise

  The scar across my tongue rigidified it.
  So, to flex it was necessary. Flexing exercises were for instance done by applying pressure on my tongue with a little spoon. They were very tedious.

  Exercise

  To escape boredom that would have made me give up, I watched movies during which I flexed my tongue.
  I subscribed to an Internet video club, and for 6 months saw between 2 and 3 movies a day (during the other rehabilitation hours, I did exercises to relearn speech sounds and articulations).

- **Reading my bedside book and various books, magazines and articles during the rest of the day, out loud**.

  It made me work articulations.

- **Singing karaoke songs**.

  They were **VERY** useful, bringing :

  - a strong increase in **speech strength**, because I sang the songs rarely melodiously but invariably at the top of my voice
  - a very consequent **articulatory work**, for I had to pronounce all words of the songs
  - an increase in **speech speed**, since I had to follow the speech rhythm of the singer; this task was particularly difficult when the rhythm was quick

- **Reading complete theatre plays out loud** (origin : pages of plays given by Speech therapist II).

  It made me relearn a lot of articulations and many tones.

I also had more minor rehabilitation ideas, such as the conduct of rehabilitation sessions over the house phone. To do so, my speech therapist and I were each with one of the 2 handsets in different rooms, and we used the internal speech function of the home telephone to speak.
Since the sound spectrum transmitted by a telephone handset is narrower than the one perceived in a face-to-face meeting, I had to concentrate on the clarity of my speech.

c. Making personal exercises fun or interesting

The execution of rehabilitation exercises for hours would have been too boring and tiring if I had spent my time only rehabilitating. As a consequence :

- Watching movies while flexing my tongue enabled me to laugh or to learn while doing exercises. Never would I have been able to spend hours of flexing exercises without being absorbed by movies I liked.

- Reading books out loud was essentially reading to laugh or to learn. In this way, the primary objective of rehabilitation almost seemed a secondary effect.

- Karaoke (on-line free songs) enabled me to jabber at the top of my voice songs I like, such as singles from the early albums of *Placebo*. I also went through all the pop, rock or heavy metal songs I knew the melody of : songs from *Renaud, Johnny Halliday, Abba, Muse, Metallica*... I really enjoyed singing particularly beautiful music pieces, such as certain songs from *Jacques Brel*.

- Reading theatre plays out loud made me work articulations while laughing a lot; I laughed for I used almost only comedies.
  I used comedies because reading a play out loud during hours in a row is easy only if it is funny; regarding comedies, I was sometimes actually looking forward to reading them.

2.2. TASKS

Other than tongue flexing, rehabilitation tasks belong to one of 4 categories :

a. Relearning certain speech sounds

This task lasted all my rehabilitation.

I had to relearn certain speech sounds the CVA had made me "unlearn". They comprised :

- numerous consonants : the whole of "fricative consonants" (*f, v, s, z, ch, j*) and part of "nasal consonants" (*m*, *n*)
- some vowels (*i, o* and the nasalized *o*, *on*)
- certain combinations of sounds (in particular *st* and *gn*)

Operations on my mouth and artificial teeth were the precondition to my relearning of a large part of speech sounds.

The state of the mouth plays a very important role in speech, for the following reasons :

- Teeth : teeth, in particular upper teeth, modulate the airflow of speech.
- Palate : its form determines in part the quality of speech sounds.

For a long time, the state of my mouth did not allow me to pronounce a large number of speech sounds :

Teeth

Until May 2007, that is almost 4 years after the accident, I did not have artificial teeth, which play a major role for speech modulation.

Palate

My mouth presents specificities which modify a little the form of my palate.
I thought this slant would result in irreparable speech problems. However, Speech therapist II told me my palate made certain speech sounds only temporarily poor. A phenomenon of adaptation would manifest itself, after which I would be able to pronounce these speech sounds well.

Adaptation took time, but was complete.
Adaptation played a very important role in my speech rehabilitation.
I had reasoned using constant parameters, but my body in rehabilitation did not have a constant field.
Adaptation is an additional explanation for the rising slope of the rehabilitation curve.

b. Relearning certain articulations

This task lasted all my rehabilitation.

Owing to my articulatory problems, for a long time I was under the impression my speech was surrounded by a "halo" that did not allow it to be clearly perceived; this "halo" was because I no longer could pronounce many articulations.
Thus, I could not pronounce without having to repeat myself, several times at the beginning, words of more than three syllables such as "*aspirateur*" (vacuum cleaner) or "*macro-économique*" (macroeconomic).

I relearned most articulations and speech sounds thanks to :

- standard speechwork exercises
- expression lists I wrote (for speech sounds only)
- the reading of all my books and magazines out loud
- karaoke songs
- "Pure Speech Rehabilitation"

c. Quickening speech

This task lasted until the end of *Pure Speech Rehabilitation I*.

That I be able to hold a conversation required that I quicken my speech while keeping it clear (I would slow a little the way I spoke during *Pure Speech Rehabilitation II* by separating words with spaces, short silences).
Two means enabled me to speak more quickly:

- **karaoke songs**
- **"Pure Speech Rehabilitation"**

d. Fine speech relearning thanks to *Pure Speech Rehabilitation I*

This task lasted 3.5 months.

Reason for "Pure Speech Rehabilitation"

In November 2006 balance rehabilitation ended. During fall 2007, relearning to write and intellectual rehabilitation were well under way. However, the level of my speech was still very unsatisfactory.
Therefore, I decided to invest myself completely in speech rehabilitation, and to devise a rehabilitation mode specifically suited to my rehabilitation case.

I call this rehabilitation mode "Pure Speech Rehabilitation" and detail it on the next page. Its *Pure Speech Rehabilitation I* initial phase lasted from December 2007 to March 2008. I thought that this "Pure Speech Rehabilitation" phase would allow me to finish to rehabilitate, but it was not the case. As a result, from August 2008 I carried out a second phase of pure rehabilitation, *Pure Speech Rehabilitation II*.

Living conditions

"Pure Speech Rehabilitation" forced me to adopt a rigorous rehabilitation regimen, indispensable in my rehabilitation case.

During *Pure Speech Rehabilitation I*, time pressure meant I could neither wash myself more often than once every two days, nor do cooking. Because of this, I essentially ate a liquid yogurt in the morning, cheese and a fruit for lunch and dehydrated soup in the evening. I rested from rehabilitation on Sunday and Wednesday, days during which I went jogging to relax. I did not go out of my small flat from Sunday evening to Tuesday evening, and from Wednesday evening to Saturday evening.
I went to sleep at 21h30 and woke up at 5h00. I forced myself to go to bed early every day, in order to :

- rest
- enable the latency effects detailed below to occur

Rehabilitation work

At the very beginning of this phase, I went to a bookstore specialized in theater where I bought approximately 30 plays. During the following months, I read them out loud.
While reading, I highlighted the words, expressions and sentences most difficult to articulate; every 2 hours, I stopped reading and pronounced them 20 to 200 times.

Pure Speech Rehabilitation I had a major effect I did not expect : it enabled me to speak much less "choppily", hence more quickly.
Before it, I had to breathe every few words, due to my misuse of air from my breathing. After it, speech became much less "choppy", because I had forced myself to pronounce longer word chains; so, I had much improved articulation capacity under time pressure, hence speech speed.

"PURE SPEECH REHABILITATION"[2]

Rehabilitational efficiency - computational parameters :

\+ 2 times more speech rehabilitation in 10 months plus latency period than during the 3.75 previous years.

\- Higher personal involvement due to my autonomous handling and my need to reach the planned rehabilitation goal, lighter rehabilitation weight, experience and physical adaptation.

➔ **5 times greater rehabilitational efficiency.**

Characteristics

- Principle : To spot my speech problems and to try to solve them all.
  To do almost only speech rehabilitation, to think almost only about it.
- Work quantity : 206 rehabilitation days over 10 months. Daily rehabilitation work of 10h for 75% of this time length, then of 6.5h for the remaining 25%.
- Elements to be attentive to : **Thickening**, and **rehabilitatory improvement following latency**.

[2] Appendix C presents my work for speech rehabilitation, and in particular "Pure Speech Rehabilitation" : documents produced and roadmaps.

Thickening

As soon as I began, I noticed a "thickening" of my mouth that made my speech less clear after approximately 3 hours of rehabilitation.
A moderately decreasing return of my rehabilitation efforts was not really a problem. Indeed, I was not looking for an ideal maximum, but for the maximal rehabilitatory effect given my medical case. Thus, for 10 hours of work, an equivalent of 8 to 9 hours of rehabilitation was acceptable.

However, to limit the thickening phenomenon, I divided the quantity of exercises in 3 sequences of 3 hours 20 minutes, separated by 2 rest periods of 2 hours.

Rehabilitatory improvement following latency

A large part of improvements only happened after a latency period. The most efficient rehabilitation demanded a rest after work of an extreme minimum of a good night, a minimum of one day and an ideal of 2 days.
In consequence, I separated by 1 or 2 days of rest rehabilitation groups of :

- 2 or 3 consecutive days, during *Pure Speech Rehabilitation I*
- 3 to 5 consecutive days, during *Pure Speech Rehabilitation II*

While speech therapist II reads the part of this book relative to speech rehabilitation, I speak almost well, whereas at the end of rehabilitation I spoke only correctly.
I do not know how to medically explain this continued improvement, but it keeps happening until I write these lines and nothing indicates it will stop.

d. Very fine speech relearning, "trimming" then "polishing" of my speech, thanks to *Pure Speech Rehabilitation II*

This task lasted 6.5 months.

My friends were beginning to ask me "Sorry ?". This question was a very positive sign for me : I no longer spoke too badly for them to feel embarrassed to ask it. However, it made clear further speech improvements were necessary.
On August 4th 2008, I went to an examination center to take the GMAT (the GMAT is an international examination necessary to apply to an MBA - Master in Business Administration -, which consists in managerial studies after a few years of professional life). The person receiving candidates did not understand my name. This lack of comprehension troubled me enormously.

So, I decided to follow a new phase of "Pure Speech Rehabilitation", which I wanted definitive. I carried out a *Pure Speech Rehabilitation II* phase from August 7th 2008 to February 19th 2009; during this phase, I very markedly increased the reflection on my rehabilitation case.

Living conditions

I lived at the home of my parents. Accordingly, I did not have to care about numerous details of living conditions, and could concentrate completely on rehabilitation.
The intensity of *Pure Speech Rehabilitation II* was comparable to the preparation of the entry examination of a "grande école" (a French specialized school for higher education).
However, I was not trying to get into a grande école, but into my life. So, my focalization on the goal was much greater.

Rehabilitation framework

Due to my improved speech, I had to be more qualitative during this phase than before. So, I began by contacting in August 2008 Speech therapist II to have the advice of a rehabilitation professional.
He told me he did not really see improvements I could do : he had difficulties to understand me at the beginning of sessions 3 years earlier, and he thought I had much improved. Then, he made a decision full of professionalism and humility : he told me another speech therapist would evaluate my rehabilitation case differently from him, and he gave me the contact details of Speech therapist III.
From September 2008, I worked with him. I **WANTED** to speak better, so I was in a state of high receptivity to his messages. Consequently, I got from sessions with him much more than I had learned until then from speechwork sessions.

Rehabilitation guidelines

They were :

- To perceive my speech as a third party, so as to prevent me from guessing a word through my partial comprehension of it.
- To pronounce a whole sentence in a continuous manner, to regain speech fluidity.
- To "dynamize" speech, to go from the rather flat oral mode of reading out loud to the more spontaneous oral mode of talking.

2.3. *PURE SPEECH REHABILITATION II*

First step - 5 months - August to December 2008.

Its aim was to relearn all speech sounds and articulations.
So, I read out :

- *Poems, upon advice from Speech therapist II, in order to regain a fine mastery of speech sounds and articulations.*

  The short length of a poem made me be attentive to each speech sound and articulation. Therefore, while reading it, rehabilitation intensity was very high. Until *Pure Speech Rehabilitation II*, I spoke too poorly to be able to use poems to rehabilitate. Henceforth, I spoke well enough.
  At first, I aimed at pronouncing correctly all speech sounds and articulations. Then, I aimed at refining their pronunciation.

  This task enabled me to relearn many speech sounds and several articulations.

- *Tongue-twisters and sentences I wrote, in order to relearn the rare speech sounds still missing.*

  Missing speech sounds were principally “j” and “ch”.
  I relearned them by pronouncing tongue-twisters and sentences I had written, 20 to 200 times.
  An example of the latter is : “*La chatte chafouine en chaussettes chamarrées chaloupe lachivement pour chéduire le chihuahua*” (The foxy cat in richly ornamented socks waddles sensually to seduce the Chihuahua)

  I noticed many sounds of these sentences did not necessitate rehabilitation effort. As a consequence, I shortened most words, so as to do more speech rehabilitation in the same time.
  Hence, the previous sentence became : “*La cha- chaf- en chau- cha- chal- lach- pour ché- le chi-*”.

  This task enabled me to complete speech sounds relearning.

- *Various texts, upon which I forced myself to control the modulation of my speech.*

  The trouble of the control of speech amplitude had markedly decreased, but still affected me. It resulted in a speech usually "flat" due to the lack of tones, but sometimes much too strong or shrill.
  So, I forced myself to read texts out loud with an even voice.

  This task enabled me to regain a complete control of speech amplitude.

Second step - 1.5 months - January to mid-February 2009

My speech was very irregular, marked by certain speech sounds and articulations I had relearned but sometimes insisted on too little or too much.
The first step of *Pure Speech Rehabilitation II* had allowed me to relearn all speech sounds and almost all articulations. This second step aimed at relearning all still missing articulations, and at automating speech and making it finer.

a. First part - 1 month

Its goal was to "trim" my speech.
So, I read out loud :

- *Homophone verses, for advanced refining of speech sounds.*

  I perceived that my speech problems no longer had to do with missing speech sounds, but with their insufficient fine mastery.
  I pronounced similarly every given speech sound. Yet, a speech sound is not pronounced exactly the same according to the letters that surround it.

  I searched the Internet for a means to refine my pronunciation of speech sounds, and found holorimes, French homophone verses. These verses are made of 2 halves, each composed with the same homophone syllables linked differently.
  Exemples : "*Dans cet antre, lassés de jeûner au palais, dansaient, entrelacés, 2 généraux pas laids*" (In this den, bored fasting at the palace, danced intertwined 2 not ugly generals), or : "*À Lesbos, à Tyr, l'Évangile est appris; ah, laisse, beau satyre, l'Ève en gilet t'a pris !" (*In Lesbos, in Tyr, the Gospel is learned; ah, leave aside, handsome satyr, the Eve in a cardigan kidnapped you !).

  This task enabled me to work finely on speech sounds expression.

- *Sentences difficult to comprehend **phonetically**, for advanced refining of articulations.*

  I searched the Internet for a way to refine my articulatory ability, and found the "difficult sentences" of a Belgian spelling club.
  These sentences were termed difficult, because they comprised very little known "rare" words. This was perfect for the role I intended for them, for it is impossible to use the context to guess them from only part of their sounds; their whole pronunciation has to be of good quality to make them intelligible.

  I read approximately 100 sentences out loud 20 times, and recorded each of them with a small recorder. What mattered during reading was not the writing of a sentence, but its **sounds** ("speech sounds"). Thereafter, I asked my Dad to listen to the recording and to tell me his phonetic comprehension of the sentences. I noted the words he had not comprehended and worked again their sentences the following days until his comprehension of them was good.

  To have to make sentences phonetically comprehensible by a third party led to my very high concentration on the pronunciation of articulations.

  This task enabled me to work finely on articulations expression.

b. Second part - 3 weeks

My speech was still "coarse"; the goal of this part was to "polish" it.
This advanced rehabilitation should make my speech "normal" again.

I no longer had problems with speech sounds or articulations, or with a speech sound pronounced with not enough or too much strength because I had not yet automated its pronunciation.
However, my speech was not "normal", and I wanted a rehabilitation task that would make it so. Consequently, I read speeches out loud, paying attention that my speech be particularly clear : separated words, varied tone, even rhythm...
These speeches comprised for instance :

- The speech held at the Panthéon (the French national repository for great human beings) for the transfer of the ashes of Jean Moulin (the head of French Resistance during WWII).
- The very famous speech against racism of Martin Luther King, "I have a dream".

This task enabled me to complete the control of breath use, and to regain "normal" speech.

***Pure Speech Rehabilitation II* ended on February 19th 2009.**
This date marks the end of my speech rehabilitation.

THIS DATE MARKS THE END OF ALL MY REHABILITATION.

2.4. PARALLEL BETWEEN MY REHABILITATION FROM DYS-ARTHRIA AND THE CREATION OF A NECKLACE

After the end of my rehabilitation, I depicted to myself the speech rehabilitation work I had done as similar to the work of a jeweler who creates a necklace without any external supply. This necklace is made of several rows of multicolored beads, and its motives are separated by little silver cylinders :

- **Jeweler** : designing the necklace on a piece of paper

  ➔ **Me** : I first had to figure out how to pronounce many speech sounds and articulations.

- **J.** : obtaining the string by weaving several threads, then makes rows with it to form the frame of the necklace.

  ➔ **M.** : I "shortened" my speech, controlled it, and relearned tones.

- **J.** : Devising a mold for each pearl, pouring molten glass to make it then trimming it.

  ➔ **M.** : I followed several rehabilitation stages to get clear speech sounds and words then the final product : clear sentences.

- **J.** : Separating beads by little silver cylinders to make patterns.

  ➔ **M.** : I inserted the controlled interstices of breath between speech sounds to make clear the group of words of a sentence.

- **J.** : Polishing the necklace to sell it to clients.

  ➔ **M.** : I rendered my speech "normal" to become able to speak with persons I am not close to.

The parallel is drawn at the end of this underpart.

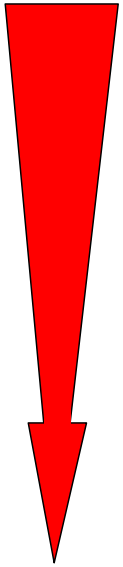
The time length of my speech rehabilitation is not at all representative of the length of speech rehabilitation from dysarthria. Dysarthria was not the sole cause of my poor speech, and not my only rehabilitation.
If the following elements were subtracted, my speech rehabilitation would have been greatly shortened :

- Tongue scarred - 6 months less.
- Damaged cerebellum - 7 months less.
- Multiplicity of my 4 specific rehabilitations - 7 months less.
- Missing teeth - 8 months less.
- Practice from the onset of "Pure Speech Rehabilitation" - 12 months less.

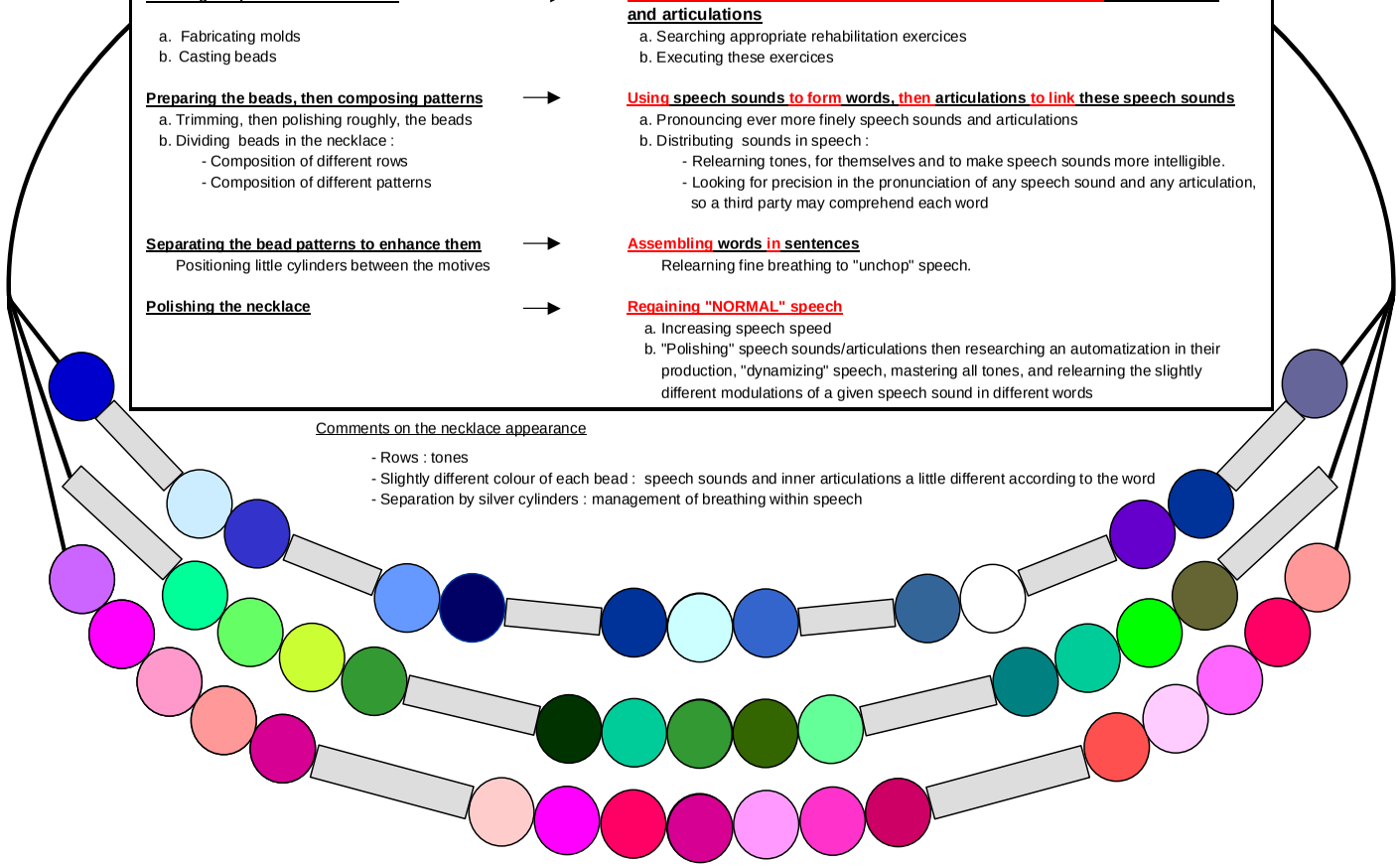
These elements subtracted, my speech rehabilitation of 54 months would have been shortened by 40 months. It would then have lasted only 1 year 2 month, or less than 2 years if I apply Emma's cautious method (50% security margin) for the computation of rehabilitation time.

Parallel between my rehabilitation from dysarthria and the creation of a necklace with several rows of multicolored glass beads forming patterns separated by small cylinders

Constant and INCREASING speech rehab improvement



Crafting the necklace	→	Rehabilitating speech
Designing the necklace a. Determining the color of each bead b. Drafting, then drawing precisely, each bead	→	**Elaborating speech sounds** a. Defining the exact auditory sensation of certain speech sounds b. Devising the pronunciation mode of the speech sounds to relearn
Creating the pearls of the necklace a. Fabricating molds b. Casting beads	→	**Determining rehabilitation means, then re-learning thanks to them speech sounds and articulations** a. Searching appropriate rehabilitation exercices b. Executing these exercices
Preparing the beads, then composing patterns a. Trimming, then polishing roughly, the beads b. Dividing beads in the necklace : - Composition of different rows - Composition of different patterns	→	**Using speech sounds to form words, then articulations to link these speech sounds** a. Pronouncing ever more finely speech sounds and articulations b. Distributing sounds in speech : - Relearning tones, for themselves and to make speech sounds more intelligible. - Looking for precision in the pronunciation of any speech sound and any articulation, so a third party may comprehend each word
Separating the bead patterns to enhance them Positioning little cylinders between the motives	→	**Assembling words in sentences** Relearning fine breathing to "unchop" speech.
Polishing the necklace	→	**Regaining "NORMAL" speech** a. Increasing speech speed b. "Polishing" speech sounds/articulations then researching an automatization in their production, "dynamizing" speech, mastering all tones, and relearning the slightly different modulations of a given speech sound in different words



Comments on the necklace appearance

- Rows : tones
- Slightly different colour of each bead : speech sounds and inner articulations a little different according to the word
- Separation by silver cylinders : management of breathing within speech

Final situation

My speech is almost good.

It does not show I rehabilitated it. It is adequate for all life situations.
However, if I “polished” the “necklace of my speech”, I did not manage to make it “sparkle”, so very small specificities remain.

Regarding them, Speech therapist II made a very seductive parallel between my speech rehabilitation and the driving of a car. He told me : “[I was] in the garage, and will henceforth be on the road. Therefore, [I] will speak better” thanks to my speech practice in life after rehabilitation.

3. Writing (relearning to write)

Rehabilitation thanks to therapy sessions : 15% - of which, at the center, 13% - Personal rehabilitation : 85%

Summary

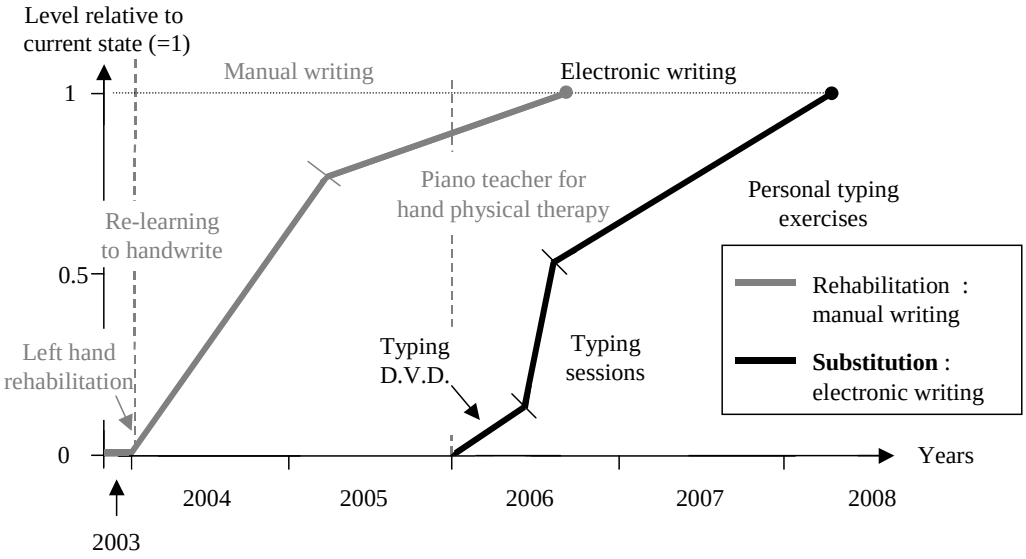
INITIAL SITUATION		**Ability to handwrite nil**
Cause		Rupture of a wrist cartilage and damaged cerebellum.
REHABILITATION MEANS	Ther. sessions 15%	Numerous handwriting exercices, practiced in occupational therapy of the rehabilitation center then in Bichat hospital.
	Personal 85%	1. Intense practice of handwriting exercises. 2. Study of a hand-rehabilitation physical therapy book. 3. Physical therapy exercices for the right hand with a piano teacher who had had specialized physical therapy for one of his hands. ***Substitution of electronic writing for handwriting*** 4. Use of keybord typing manuals. 5. Three dactylography programs in training institutes. 6. Typing of book summaries during entire afternoons for 1.5 year. 7. Typing of sequel frameworks to a book written by a friend.
Duration		4 years 3 months
FINAL SITUATION		**- Handwriting : from the left hand, acquired but not good** **- Electronic writing : good**

Initial situation

Relearning to write was essentially a post-rehabilitation task.
I began by rehabilitating my hands, to control them. However, I mention here only relearning to write because it was the purpose of hands rehabilitation.

I am a right-hander. Because of several casts to my arm, I used the left hand to relearn to write. With the left hand, problems to handwrite are solely caused by the damaged cerebellum.

Relearning curve



The summit of the curve relative to handwriting is high, because it does not correspond to the level of a very good handwriting, but to that of mine. Compared to very good handwriting, it is approximately 60%.
In consequence, I substituted electronic writing (automatic touch-typing) for handwriting.

General considerations

My need to relearn handwriting was mostly caused by my damaged cerebellum. However, it was also due to the fracture of my right hand, consisting in the severance of a cartilage between the wrist and the thumb. Three operations took place to mend it :

- Attempt to reduce the wrist fracture (failure).
- Attempt to graft the wrist with bone taken from my cranium (failure).
- Implant of a wrist prosthesis (small and flexible round carbon fiber piece fixed by screws).

Since I relearned to handwrite with the left hand, operations to the right wrist were not an obstacle to handwriting exercises.
However, my right wrist needed to regain flexibility (wrist flexibility was very useful when I substituted electronic writing for handwriting). For this, when my right arm was not in a cast I had rehabilitation sessions for the wrist in the physical therapy of the center.
In addition, to improve the flexibility of my wrist the physician in charge of me in the center had the prosthesis-maker make a brace. This brace was comprised of two thermoformed plastic pieces which went around my hand and my wrist, connected by an elastic band that raised the hand.

Paramedical rehabilitation means

- **Relearning to handwrite in occupational therapy of the rehabilitation center**

  Months 3-15. Tri-weekly session

It was very long, and began at a very low level. I wrote to begin with letters, then words, then sentences. After a year, I could write paragraphs.

- **Handwriting sessions at Bichat hospital**

  Month 28-29 - Weekly session

The very low return of these sessions led me to cease them. I put an end to my relearning of handwriting, and substituted electronic writing for it.

Personal rehabilitation means

I tried numerous things in order to improve my handwriting ability, be it through better writing ability of the left hand or through rehabilitation of the right hand.
Attempts comprised :

- Rehabilitation exercices. They were done with a piano teacher who had had very numerous sessions of specialized physical therapy for one of his hands damaged by an accident. They aimed at enabling me to write again with the right hand.
- Personal handwriting exercises. I used for them a primary school handwriting exercise book.
- Purchase, then study, of a physical therapy book specialized for the hand.
- Purchase, then use, of pen grips enabling a better “unrolling” of the hand during writing.

Each of these attempts improved very little the writing of the left hand or the writing ability of the right hand. Hands themselves are not to blame, but the damaged cerebellum, which can no longer perfectly coordinate handwriting gestures; in consequence, my handwriting was unsatisfactory and I did not see how I could improve it more than I had already done.

So, I decided to **substitute** electronic writing for handwriting.
To learn it was very long and very difficult, owing to my coordination problems. One of my typing manuals mentions 50 hours as the time length required to learn typing. I needed 1 500 hours to type correctly, and 2 500 hours to type almost well. Nowadays I type well on a keyboard.

To reach this level required :

- Purchase, then practice, of several typing software programs.
- 3 weekly typing sessions in 2 professional training institutes, one generalist and one specialized in the typing jobs assistants sometimes do.
- Use of my laptop computer to :
    - do typing exercises
    - type 5-page essay summaries
    - type sequel frameworks to a novel just written by a friend

During 1.5 year, I took the suburban train 5 days a week to go to Paris. I went there to learn typing during 4 to 6 hours.
To do this, I went to one of various libraries or in a “Starbucks” coffee shop. The shops of this chain are particularly practical to learn typing, for they almost systematically have a large table suited for laptop computers. Furthermore, I found their employees very pleasant, and their behavior was a strong incentive for me to go there, owing to the psychological pressure I lived under.

Final situation

- Handwriting : poor, sufficient for a tolerant addressee, otherwise insufficient
- Electronic writing : good (I wrote with it the guide of which this book is part)

4. Intellect

Rehabilitation thanks to therapy sessions : 8% - at the rehabilitation center, none - Personal rehabilitation : 92%

Summary

INITIAL SITUATION		**- Reasoning : small attention problems** **- Memory : light "knowledge gaps"**
Cause		CVA and high-pressure in the cranium
REHABILITATION MEANS	Ther. sessions 8%	A few months of neurological rehabilitation.
	Personal 92%	1. Electronic games for neurological rehabilitation, purchase then daily practice. 2. Physical tactical game, purchase then daily practice. 3. At the rehabilitation center, preparation of an international fund management professional examination, the CFA. (origin : books brought by a close friend) 4. Chess, daily plays from 2004 to 2007. 5. When I left the rehabilitation center, intellectual rehabilitation thanks to the exercises of an international examination to conduct studies after initial studies, the GMAT. (origin : mention by a close friend)
Duration		4 years 5 months
FINAL SITUATION		**- Reasoning : completely recovered** **- Memory : completely recovered**

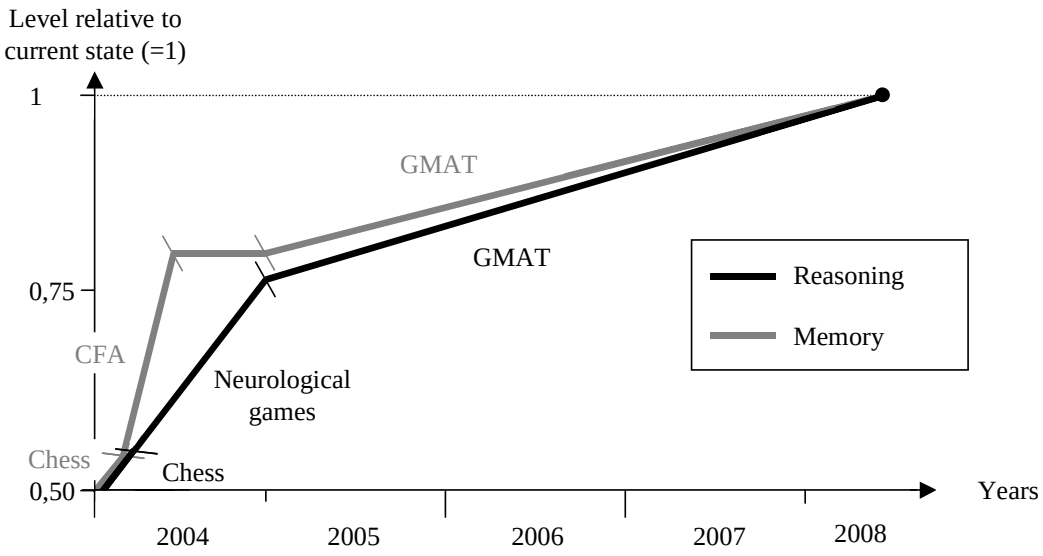
Initial situation

- Reasoning - a part of intelligence that is “framed”

  The neurologist of the rehabilitation center noticed small attention problems.
- Memory

  I forgot things and repeated myself sometimes.

Rehabilitation curve



The CFA had a very strong influence on memory, but a weak one on reasoning. So, it does not appear on the reasoning curve.
Neurological games had a strong influence on reasoning, but a weak one on memory. So, they do not appear on the memory curve.

General considerations

My rehabilitation of intellect comprises 2 elements :

A. Rehabilitation of reasoning
B. Rehabilitation of memory

I did not pay much attention to the medical definition of my intellectual problems, for 2 reasons :

- The definition of the domain of intellect is very awkward.
- Medical norms for patients are undemanding.

Paramedical rehabilitation means

In spring 2004, I had a trimester of neurological rehabilitation out of the rehabilitation center. This rehabilitation essentially consisted in the playing of electronic games for neurological training, and of a physical tactical game.

Personal rehabilitation means

- **Games of neurological rehabilitation** [3]

  Electronic games : months 6-12, half an hour daily
  Physical game : months 6-11, half an hour daily - months 12-23, 15 minutes daily

I enjoyed these games a lot. So, I asked my paramedical therapist for their references, bought them and practiced them daily :

- Electronic games for neurological training

  Training in particular on that of those games which appealed to me most. At the beginning, struggle at its intermediary difficulty level, and occasional failure to finish a game in the time allocation of 3 minutes. After 7 months, play at its highest difficulty level, and use to make approximately 30 games in half an hour.

- Physical tactical game

  Playing against my Dad for half an hour for 6 months, then for only a quarter of an hour for a year. Thereafter, occasional playing against myself but with a lower frequency and for pleasure only.

- **Chess**

  Months 5-42 - Very variable daily frequency, from 1 to 5-6 games

I played at the beginning on week-ends with an electronic game my sister had given me as present for Christmas 2003. Then, when I could walk I played chess on weekdays with my travel game in the rehabilitation center : I memorized and played openings, and played against myself. Finally, I had the luck to find another patient, Roman, with whom I played several times a week in the “club” of the hospital. I beat Roman... not a single time. I was very happy to learn to play correctly thanks to him. Since he could not move the pieces, he indicated the references of his move and I played it for him.
When I left the rehabilitation center, I continued to play but much less often, and I stopped when I moved into my student apartment in Paris.

[3] Appendix D provides the references of these games.

- **CFA examination**

  Months 7-11 - Several hours daily, on most days

The CFA is an international professional fund management examination. For my intellectual rehabilitation, in January 2004 a close friend called Tristan brought me the examination manuals at the rehabilitation center.
The memorization of the very important amount of knowledge (amount contained in 5 books) necessary for the examination allowed me to significantly rehabilitate my memory. I did not work at all in fund management before the accident, but I found the examination very interesting. So, I registered in February 2004 for a session of the examination that took place in May. I still could not independently walk when I registered, but I was well on my way to leaving the wheelchair.
At the beginning of May, I had a good score on the practice examination, and I had to take the examination 15 days later. A stag party for one of my friends took place the day before. I wanted to participate, but I wished to go to sleep just after dinner to be in fine form for the examination. However, I was "kidnapped", and kept at the party that was taking place in a moving autobus.

The persons who did this rendered me a valuable service : I was rehabilitating all the time, and I absolutely needed to relax ! I could not dance at all during the stag party, but I had a lot of fun. I went to sleep in the morning around 9 am, the hour at which the examination began. This stag party was much more lively and wild than would have been the fund management examination session, and certainly more beneficial !

- **GMAT examination**

  Months 58-59 - Exercises from month 16. Very variable daily practice, from a complete absence to several hours

At the end of December 2004, a close friend called Amir informed me he was taking the GMAT to apply to an MBA. He needed to take this examination to be, partly as a result of the rank that proceeds from it, selected by the admission committee of an MBA.
This information about GMAT had a very important effect on my intellectual rehabilitation. I bought examination preparation manuals, and I did exercises on most days for 3 years. This practice enabled me to finish to rehabilitate in terms of reasoning and memory.

In spring 2008, I decided to enlist for a session of the examination. I prepared the examination in June and July, and I took it at the very beginning of August. The failure of the person who was receiving candidates to comprehend my name caused *Pure Speech Rehabilitation II.*

Final situation

- Reasoning : I regained pre-accident level.
- Memory : I regained pre-accident level.

C. POST-EXECUTION COMMENTS

1. Negative comments

1.1. The length of my rehabilitation made me doubt about its rationality; this doubt limited my rehabilitation will

It is only in fall 2007 that I realized the logic of optimized rehabilitation chapter A of part I exposes.

That I had to rehabilitate was not my choice. However, it was indispensable, due to the physical consequences of an accident that was not my choice either.
The accident had occurred; it was part of the PAST. For my FUTURE, I had to do as well as possible with its physical consequences on my body, and I needed time to do this.

Until then, I had not rationalized my important lifetime investment (rehabilitation years invested). So, I sometimes wondered whether my rehabilitation made sense. I was very happy to be obsessed with my rehabilitation, for my temporary monomania was necessary to carry it out effectively; however, I feared this obsession was unreasonable.
My discovery of the rationality of my rehabilitation led me at last to embrace it unreservedly. The major speech improvements brought by “Pure Speech Rehabilitation” bear witness to it.

1.2. I conceptualized my speech rehabilitation much too late

I did not try to understand and formulate a well-organized idea of my speech rehabilitation until “Pure Speech Rehabilitation”.
Beforehand, I used without thinking the standard speech rehabilitation techniques I had learnt from my speech therapists. They did not result in satisfactory rehabilitation results, so I carried out from December 2007 “Pure speech rehabilitation” as a last rehabilitation recourse; it was tough but worked.

Had I conceptualized from the onset my speech rehabilitation, I would have cut short by 9-15 months its time length of 4.5 years.

My negative comment of a very late reflection on speech rehabilitation can be generalized in the critique of a lack of reflection for my entire rehabilitation.
I fell back too much on paramedical professionals, so I conceptualized too lightly each specific rehabilitation.

A key element for your rehabilitation emerges from this comment :
REHABILITATION DEMANDS DOING WITHOUT THINKING, in particular without thinking further than the very near future, BUT THINKING BEFORE DOING.

2. Positive comments

2.1. I knew what I wanted : myself rehabilitated as completely as possible

Some of my friends told me : "You have rehabilitated enormously. You should look for a job". This comment left me utterly cold, for 4 reasons :

- First, none of my friends realized the extent of the specific rehabilitations I had to carry out. This is all the truer that I progressively stopped talking about them, in order to de-saturate from my rehabilitation.
- Second, I knew perfectly well that they are much more tolerant with me than the job market would be.
- Third, I refused a rehabilitation which did not allow me to completely exert my professional skills, provided I could arrive at a satisfactory rehabilitation state.
- **Last and most of all, I did not want an employer, for I had a critical prior job for myself : my rehabilitation job. I wanted to regain myself, as completely as possible, to enjoy life thereafter.**

During my rehabilitation, I lived on very small financial means. But they sufficed to enable the carrying out of my rehabilitation, which was the only thing that mattered to me.

In Book 1, My Rehabilitation, I write I refused to work for another company than myself so I could work to my rehabilitation. It was not a heart-rending choice : it obviously was what I had to do.

2.2. I refused to leave “real life”

I soon realized that people in the rehabilitation field are not at all representative of the rest of society. So, just after I had relearned to walk, I reintegrated “real life”, life outside the rehabilitation field.

Real life brought me 2 elements :

1. **Duty of rigor**

   Thanks to it, I had to be much more exacting with myself than the rehabilitation cocoon required me to be.

2. **Replenishment of psychological energy, and de-saturation from rehabilitation**

   During the first 3 years, I did not really live, for I spent almost all my time rehabilitating : I had numerous medical appointments and rehabilitation sessions, and worked alone on my body.
   During years 4 and 5, I could enjoy life a little. This enabled :

   - Replenishment of psychological energy : through the presentation of elements of pleasure that enabled to stock it up. They comprised for instance nice people whom I met, little kids, dogs, nature...
   - Desaturation : by thinking about subjects entirely exterior to rehabilitation, such as macroeconomic questions, mountain climbing and athletics, the origin of the human being...

Conclusion

I wrote the rehabilitation guide to which this book belongs in hope that it possibly be useful.
That it becomes so belongs to each of its readers.
If one of them decides to optimize her rehabilitation, I wish her success.
I **TRULY** wish her this.

GM