

"I FORGOT MY BOOKS AT HOME AGAIN..."

"I DON'T KNOW WHERE TO START.. DO MY
HOMEWORK OR STUDY FOR THE EXAM?..."

"I GUESS I AM NOT AS SMART AS MY FRIENDS..."

BRAIN

Better understanding And preventing
Neuropsychological difficulties

**TOOLKIT FOR PROFESSIONALS
AND ADOLESCENTS**

CLINICAL BOOKLET

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Alexandra R.-Mercier, Élisabeth Thibaudeau, Amélie M. Achim and
Geneviève Dufour



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Neuropsychological Difficulties in Daily Life

Scenarios are presented in the following pages to show the impact that neuropsychological difficulties can have on everyday life. These are examples illustrating the day-to-day life of some adolescents experiencing neuropsychological difficulties. This toolkit also includes strategies that may reduce the impact of neuropsychological difficulties. These strategies are presented for information purposes only and are not meant to replace the expertise of a qualified professional in the assessment and management of neuropsychological difficulties.



NOTICE to Professionals and Adolescents

Since **each person has their own neuropsychological strengths and challenges**, you may recognize yourself in some of the scenarios. However, when neuropsychological difficulties become **debilitating or start interfering** with daily life, a qualified professional should be consulted.

Keep in mind that the purpose of this toolkit is to stimulate the interest of professionals and adolescents in neuropsychological functioning. It also aims to raise awareness of some strategies that may be used to reduce the impact of neuropsychological difficulties on daily life. This toolkit is an information document and in no way replaces the expertise of a professional qualified to assess neuropsychological difficulties.

Major Cognitive Domains*

● Frontal lobe
 ● Parietal lobe
 ● Occipital lobe
 ● Temporal lobe

| | | |
|--------------------------------------|--|--|
| Processing speed | ● ● ● ● | Speed or rhythm at which a person processes information or initiates mental operations or tasks. |
| Attention | ● | Capacity to attain a level of alertness that allows us to focus on various situations. |
| Working memory | ● | Ability to temporarily maintain and manipulate information in memory, for short time periods (seconds). |
| Long-term memory | ● ● | Ability to remember everyday life events, things learned in school, etc. Long-term memory processes include episodic memory (events in our personal lives) and semantic memory (general knowledge). |
| Executive functions | ● | Processes involved in new or complex situations. These include inhibition, mental flexibility (or cognitive flexibility), updating, and planning/organization. These processes coordinate other cognitive functions, much like an orchestra conductor. |
| Praxis | ● ● | Ability to coordinate purposeful movements. |
| Visual and spatial perception | ● ● ● | Ability to perceive surrounding objects according to their orientation, shape, colour, distance, and location in space / the environment. |
| Social cognition | ● | Processes that support our understanding of the people around us and social interactions. |
| Language | ● ● | Allows for communication and includes expressive language (speaking and writing) and receptive language (understanding what is heard or read). |

*These are cognitive domains usually assessed in neuropsychology, but other cognitive processes also exist.

Cognitive Processes and the Brain

Cognitive processes are supported by different parts of the brain, but they rarely rely on a single brain region. This figure shows the brain regions most often associated with the main cognitive domains.





Processing Speed

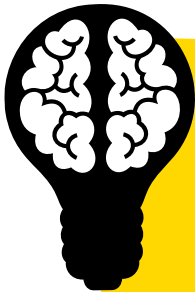
RACHEL

Rachel has noticed that it takes her a long time to complete certain tasks and activities. Her difficulties are due to a slower **processing speed**, which is the speed at which her brain processes information that she perceives or thinks about.



DIFFICULTIES WITH PROCESSING SPEED

Rachel needs more time to complete her exams at school. She has difficulty thinking quickly and accurately. As a result, she often makes mistakes when she rushes to finish on time. Rachel has also realized that she struggles at times to follow the conversation when chatting with friends. She finds it hard to adjust to all the different topics discussed over a short period of time and respond appropriately to her friends.



Supportive strategies for processing speed difficulties

- Highlight the important information in your course notes and textbooks.
- Do not hesitate to ask questions to make sure you understand.
- Use a visual timer to better manage your time.

Attention

ELLIOT

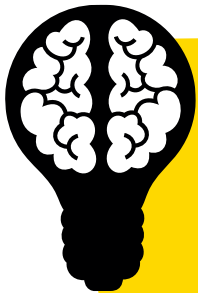
Elliot knows he has trouble staying focused during various daily activities. His **attention** problems mostly arise at school.



ATTENTION DIFFICULTIES



Some mornings on the bus, Elliot finds himself getting lost in his thoughts and daydreaming rather than paying attention to the stops as they pass by through the window. He sometimes even misses his stop because he is not being **vigilant**. In class, Elliot sometimes needs to write information down while his teacher is talking. However, it is hard for him to divide his attention between the two tasks, so he often loses track of what's being said. Elliot's difficulties are related to a function called **divided attention**. He also struggles to stay focused over long periods of time. When he does need to stay focused for a long time (like during an exam), he makes careless mistakes. In this case, his **sustained attention** is impaired. Moreover, when Elliot does his homework in the evening, he is distracted by even the slightest noise (for example: his brother walking down the hall) and then has trouble refocusing. It is due to **selective attention** difficulties, which gives people the ability to ignore irrelevant information and focus on the task at hand.



Supportive strategies for attention difficulties

- Avoid distractions (for example: cellphone, music, pictures, windows) and wear earplugs if necessary.
- Alternate between tasks or homework that cover different areas of interest.
- Take frequent breaks to avoid fatigue.
- Perform boring tasks and homework when you are most alert (for example: in the morning).

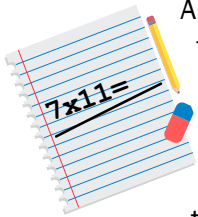
Working Memory

ANTHONY

Anthony has noticed that his grades are falling due to problems with his working memory. He has decided to work on these difficulties to make sure he passes his courses.

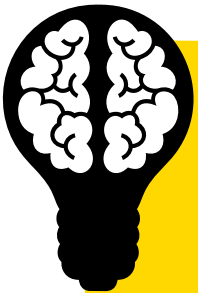


DIFFICULTIES WITH WORKING MEMORY



Anthony has discovered that he has problems with his **working memory**, which is responsible for maintaining information that he has read, heard, or seen for a few seconds to a minute in his head. It also makes it possible to “manipulate” this information.

Working memory comes in handy when Anthony needs to do mental calculations (for example: 7×11). To solve the equation, he must temporarily remember the numbers and the operation, and then perform the calculation. Math is challenging for Anthony because he can never remember an entire equation. Anthony’s working memory problems also impact his performance in exams. He has trouble understanding the exam questions because he finds it difficult to consider all the information in his mind at the same time. It is even worse with lengthy instructions because his working memory gets overloaded.



Supportive strategies for working memory difficulties

- Repeat the information over and over again in your head.
- Ask your teacher or a family member to give you one instruction at a time.
- When doing a complex task, write down and simplify the instructions for reference.



Long-Term Memory

EMILY

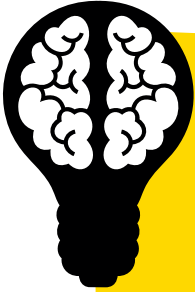
Emily has difficulty with her **long-term memory**. Even though it is called “long-term memory”, this type of memory does not only deal with memories of events in the distant past (for example: 5 years ago), it handles more recent ones too (for example: 30 minutes ago).



DIFFICULTIES WITH LONG-TERM MEMORY

Long-term memory includes two subtypes: episodic memory and semantic memory. **Episodic memory** refers to memories of events you experienced and their spatiotemporal and emotional context (the time and place where the event occurred and your emotions at the time). For example, people can remember things such as their first trip abroad and are able to recall the moment they took a plane for the first time and how they felt about it (for example: excited, stressed). **Semantic memory**, on the other hand, refers to general knowledge about objects, concepts, and words as well as their meanings, without any temporal or spatial information. For example, someone might know all sorts of facts about Washington D.C.: Washington D.C. is the capital of the United States, the White House is located there, etc.

Emily does not have any problem with her semantic memory (her memory for general knowledge). She knows, for example, that the Eiffel Tower is in Paris. She is able to remember this type of acquired knowledge. Moreover, she does not struggle to find words or forget what they mean, so her semantic memory is unaffected. However, Emily does have problems with her episodic memory. Sometimes, she cannot remember events she has experienced. She also forgets important dates (for example: the dates of her exams), especially if she does not write them down in her planner.



Supportive strategies for difficulties with episodic memory

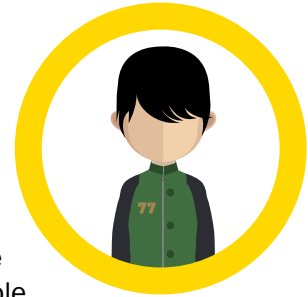
- Create mental images when you are studying for an exam (visualize words or images in your head).
- Make connections between the information you need to memorize and events you have experienced or knowledge you already have.
- Repeat, rephrase, and summarize new information.
- Use mnemonic aids (for example: associate words with images).
- Use external memory aids (for example: planner, cellphone, sticky notes).
- Always put things in the same place (for example: put your keys on the shelf by the door).



Executive Functions

YOAN

Yoan loves to play sports and is always looking for new thrills and ways to change up his routine. But he sometimes has trouble doing his activities because of difficulties affecting his **executive functions**. You might think of executive functions as an orchestra conductor that coordinates and blends together a whole range of musical instruments to produce a beautiful melody. The conductor watches over all the instruments and sometimes asks certain ones to play louder than others. Like a conductor, our executive functions coordinate and manage cognitive processes (for example: attention) to ensure optimal neuropsychological functioning.



DIFFICULTIES WITH EXECUTIVE FUNCTIONS

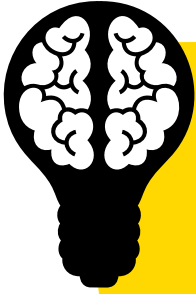
Yoan has noticed that he tends to say everything that pops into his head and struggles to prevent himself from acting spontaneously. He is often told that he acts impulsively, without thinking. Yoan says that he has trouble adapting to new situations and that his behaviour occurs automatically. Yoan has **inhibition** issues. The inhibition process is often described as a filter or brake that we impose on our behaviours and thoughts. It allows us to think, anticipate the consequences of our actions, and find solutions to problems.

Yoan also has difficulties adapting when unexpected things happen and switching quickly from one task to another. When doing homework, for instance, he finds it more difficult to do an assignment when he needs to switch between different sets of instructions (for example: between division and addition). He finds it hard to alternate between the two instructions. This suggests that Yoan has difficulties with **mental flexibility**. This function allows people to adapt their behaviours and thinking based on changes in instructions, tasks, etc.

Yoan has noticed that it is difficult for him to replace information that he learned a few seconds ago with new important information. For example, if his mother asks him to bring her some bread and butter but changes her mind and asks him for bread and orange juice instead, Yoan will still bring bread and butter because he struggles with replacing the old information with the new request (orange juice instead of butter). Yoan presents difficulties that affect his **updating** process.



Yoan often forgets his school supplies and has difficulty organizing his activities. He does not plan and rarely thinks ahead about the best way to accomplish a task. This points to difficulties with **planning and organization**. These functions are essential for planning actions and achieving goals.



Supportive strategies for executive functioning difficulties

Inhibition

- Develop effective strategies to reduce impatience (for example: taking a deep breath).
- Take a step back before speaking or acting and ask yourself “*Do I really need to do this?*”
- Before you act, remember the positive consequences of good behaviour and the negative effects of inappropriate behaviour.

Mental flexibility

- Reduce your workload and, if necessary, ask help from people around you.
- Perform tasks at your own pace and avoid putting too much pressure on yourself.
- Work in a quiet environment with as few distractions as possible.

Updating

- Use any form of memory aid to record new information for future reference.
- Take the time you need to process and adjust to new information.

Planning and organization

- Make a checklist of activities to do during the day.
- Write a detailed list of the steps to take before starting a task.
- Establish a daily routine.
- Divide up tasks: set a goal, identify sub-objectives, and think about other solutions if issues arise.



Praxis

ZACK

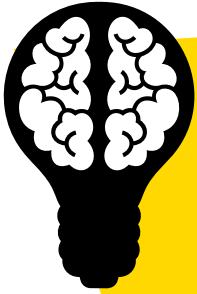
People who know Zack think he is clumsy. He has difficulties with motor activities and sports that require precision and agility. Goal-oriented actions are a challenge for Zack due to problems associated with **praxis**.



DIFFICULTIES WITH COORDINATION AND PLANNING OF MOVEMENTS

Praxis is the ability to voluntarily coordinate or adapt one's movements to achieve a goal. A praxis disorder results in difficulties when coordinating, planning, and performing gestural activities. This disorder is called an apraxia when it occurs as a result of a brain injury and dyspraxia when it is present during development. Every time the person performs an action, it is as if they were doing it for the very first time. It may also involve difficulty with **fine motor skills**—precise movements used to reach, grasp, or manipulate small objects, mainly using the fingers (for example: writing with a pencil).

It is hard for Zack to perform new gestures that are normally done spontaneously by others. Despite multiple attempts and a lot of effort, a number of gestures are difficult for him to perform. He always needs to think about the steps required to perform a gesture, even if he has done it before. For example, he avoids playing sports because he has difficulty coordinating and planning the required movements. Zack is quite clumsy. He often falls, bumps into things, and drops things. He has difficulty coordinating his gestures to achieve a goal. Zack has a problem that affects praxis, making it difficult for him to **voluntarily and spontaneously coordinate, plan, and perform gestures**.



Supportive strategies for praxis difficulties

- Break down complex tasks in multiple small actions that can be described verbally.
- In the beginning, it can be helpful for someone to stay close by to help guide actions. After a while, they can gradually step back as the person learns to perform the actions by themselves.
- Make gestures automatic through repetition and training.





Visual and Spatial Perception

JADE

Ever since she started playing basketball in gym class, Jade has noticed significant difficulties that affect her ability to participate. Jade experiences trouble with **visual and spatial perception**.



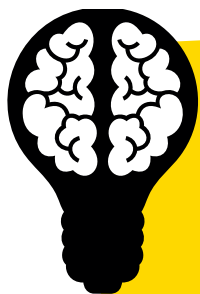
DIFFICULTIES WITH VISUAL AND SPATIAL PERCEPTION

Visual and spatial perception refers to the ability to clearly perceive objects according to their orientation, shape, colour, distance, and location in space / the environment. Perception depends on the transmission of sensory information (information from our senses), like vision. For example, when someone sees a car, they can identify it and locate it in space with reference to where they are (for example: very close or very far away).

Jade finds it difficult to assess the distance between herself and objects. For example, she is rarely able to catch passes on the basketball court. It is because of her difficulties with **spatial perception**—her ability to analyze the distance of the ball and its movement in space. As a result, she has trouble catching it at the right time. Sometimes she does not throw the ball hard enough or she throws it too hard because she misjudged the distance between her and her teammates.

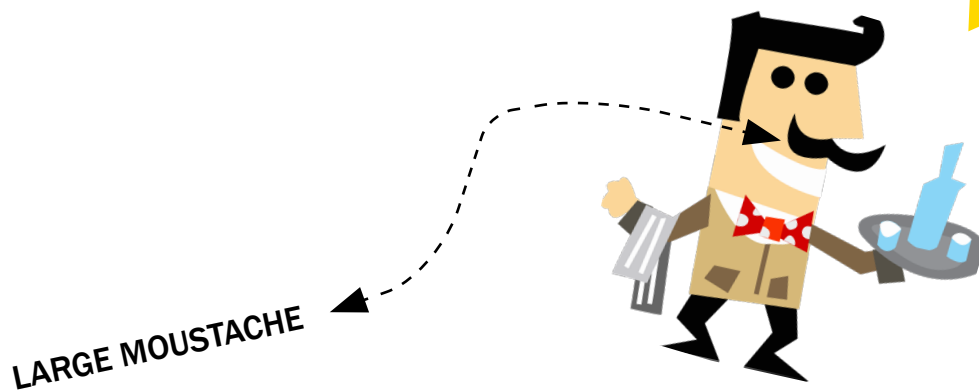
Jade also has difficulty with **facial perception**. She sometimes has trouble telling her teammates apart and mistakes them for one another. She has even passed the ball to a player on the opposing team because she mistook them for one of her teammates. Since Jade also has difficulty with **visual perception of objects**, she has trouble recognizing certain objects, especially when they are complex or placed at unusual angles of sight (for example: an upside-down bicycle).





Supportive strategies for visual and spatial perception difficulties

- Use other intact sensory information to aid recognition (for example: use touch to recognize objects that are hard to recognize visually).
- Change your viewing perspective to aid recognition of objects (look from a more usual angle of sight).
- Keep your environment structured and predictable (for example: put objects in the same spots so you recognize them right away).
- Give yourself more time to do tasks that require visual or spatial perception.
- Pay attention to specific features to identify/recognize faces (for example: tone of voice, specific features like a moustache or a mole).



Social Cognition

LAUREN

Today, Lauren felt misunderstood and had a hard time understanding why some people acted the way they did. She was in a good mood when she arrived at school and saw her friends because she was very excited to show them her new cellphone. But when she came up to her best friend Catherine and proudly showed off her new purchase, Catherine just said *“Oh! That’s the one you chose!”* then looked nervously at her watch and said she had to leave. Lauren reacted very poorly because she thought her friend was judging her choice in an insulting way! She spent the day replaying the event over and over again in her mind and felt hurt. However, in the evening, she got a text from Catherine saying *“Hi, sorry I had to leave so fast. I had an exam that was stressing me out and I wanted to study a little bit before it started. Great choice of cellphone, by the way!”* Lauren realized she may have jumped to conclusions. If she had not gotten carried away by her emotions, she would have realized that Catherine did not mean to hurt her feelings but was actually dealing with a stressful situation.



DIFFICULTIES WITH SOCIAL COGNITION

This situation illustrates how certain aspects of **social cognition** can influence social interactions. Social cognition includes the various mental processes that allow us to perceive, interpret, and adapt to social situations.

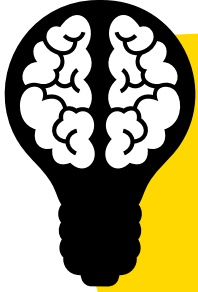
Emotion processing is one of the social cognition processes. This refers to the ability to correctly perceive and interpret facial expressions of emotions and verbal and non-verbal language. The process also refers to the ability to regulate emotional reactions. In the previous situation, Lauren had the impression that Catherine was not paying much attention to her because she looked nervously at her watch and did not show any verbal or non-verbal signs of enthusiasm. Lauren therefore interpreted Catherine’s facial expression as indifference, which is what most people would probably conclude in this situation. However, Lauren subsequently had great difficulty regulating her negative feelings and did not consider the nervousness that her friend was exhibiting.

A second important function of social cognition is **social perception**, which is the ability to decode and interpret social cues from other people (for example: deducing that two people are in a relationship from their behaviour). Social knowledge is a component of social perception and refers to our general knowledge about various social situations and the social norms related to them (for example: knowing that you should not talk during a movie at the cinema).

This knowledge helps us understand and adapt to different social situations. Catherine's non-verbal behaviour—looking at her watch and not paying attention to Lauren—exhibited a lack of interest. Since such behaviour may indeed be associated with boredom, Lauren concluded that Catherine was trying to find a way out of the conversation to avoid talking about Lauren's cellphone, which caused Lauren a great deal of frustration.

The last function of social cognition is **theory of mind**: the ability to understand other people's intentions, beliefs, and emotions. This complex function combines emotion processing with social perception. For example, when Catherine said "*Oh! That's the one you chose!*", Lauren perceived it in a negative way. She thought Catherine believed she had made a bad choice. Based on the information available to her, she misinterpreted what Catherine meant.





Supportive strategies for difficulties with social cognition

- Before jumping to conclusions, take a step back from your initial judgment and ask yourself *“Do I have enough information to make a judgment?”*
- Make other hypotheses: *“Could the person have another intention that I have not considered?”*
- When possible, ask whether your perceptions are valid (for example: *“Are you mad at me?”*).
- Ask yourself how you would like others to behave towards you in the same situation and act accordingly.

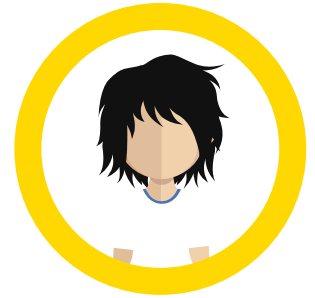




Language

MEGAN

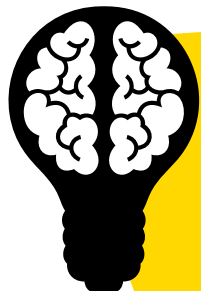
Ever since she started school, Megan has had difficulty understanding what she is supposed to do and meeting her teachers' expectations. She has particularly low grades in English.



LANGUAGE DIFFICULTIES

This year, Megan had to do an individual oral presentation in front of her class. Although she chose a subject she liked and was familiar with, she was unable to find the right words to express herself. She kept having to stop and think about what she wanted to say and to find the right words. Her teacher also deducted points because her sentences were unclear, which made her presentation difficult to follow. Megan is used to having these kinds of difficulties since the same thing happens when she is writing or talking with people. It is especially inconvenient when she has to speak in front of a group. Megan has difficulty with **expressive language**.

Reading comprehension exams are also difficult for Megan. She has trouble distinguishing between different question words (for example: when, how, and why), which makes it hard to locate the right information in the text to answer the question. Moreover, her reading assignments include more and more abstract words, which she has trouble understanding. Oral comprehension is also a challenge. Last week, she went to see a movie with a friend, but quickly lost track of the long and complex dialogue. As they were talking about the movie on the way home, Megan realized that she had not fully understood the plot. Her friend made her realize that she tends to take messages literally, without considering the nuances. These situations reflect Megan's difficulties with **receptive language**.



Supportive strategies for language difficulties

- For an essay question in an exam, make a plan before writing your answer.
- When possible, simplify instructions by breaking down tasks into brief statements.
- Repeat or re-explain the instructions to make sure you understand and ask for a demonstration or example, if possible.



Resources

When certain difficulties become too overwhelming or interfere with daily functioning, a qualified professional needs to be consulted. This section lists useful resources.

Family physician

Psychologist or neuropsychologist:

Professional qualified in the assessment and treatment of affective and neuropsychological difficulties.

Speech therapist:

Professional qualified in the assessment and treatment of language difficulties or disorders.

Psychoeducator:

Professional who works with people with behavioural adjustment problems in their various environments.

Social worker:

Professional who helps people and communities experiencing problems associated with difficult, crisis or day-to-day situations.

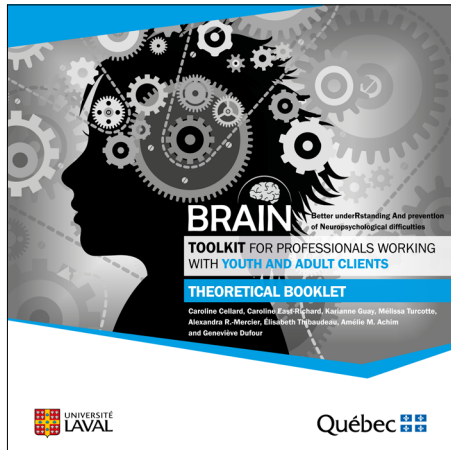
Remedial teacher:

Professional who assesses and intervenes with people who may have learning difficulties.

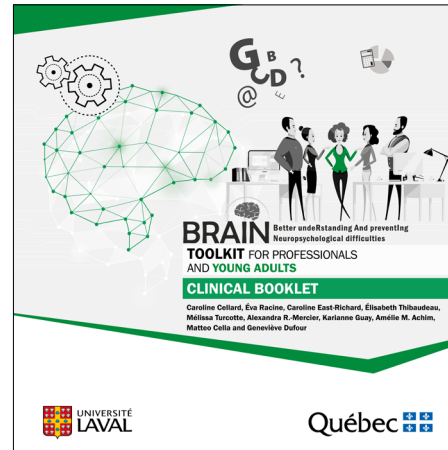
Associations or community organizations in your local area:

Various services that can be offered for you or your loved ones.

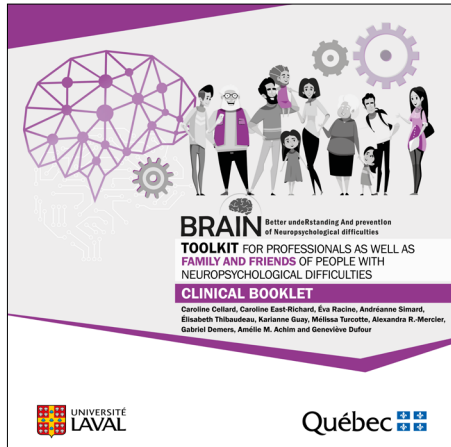
In the Same Collection



THEORETICAL BOOKLET



CLINICAL BOOKLET (young adults)

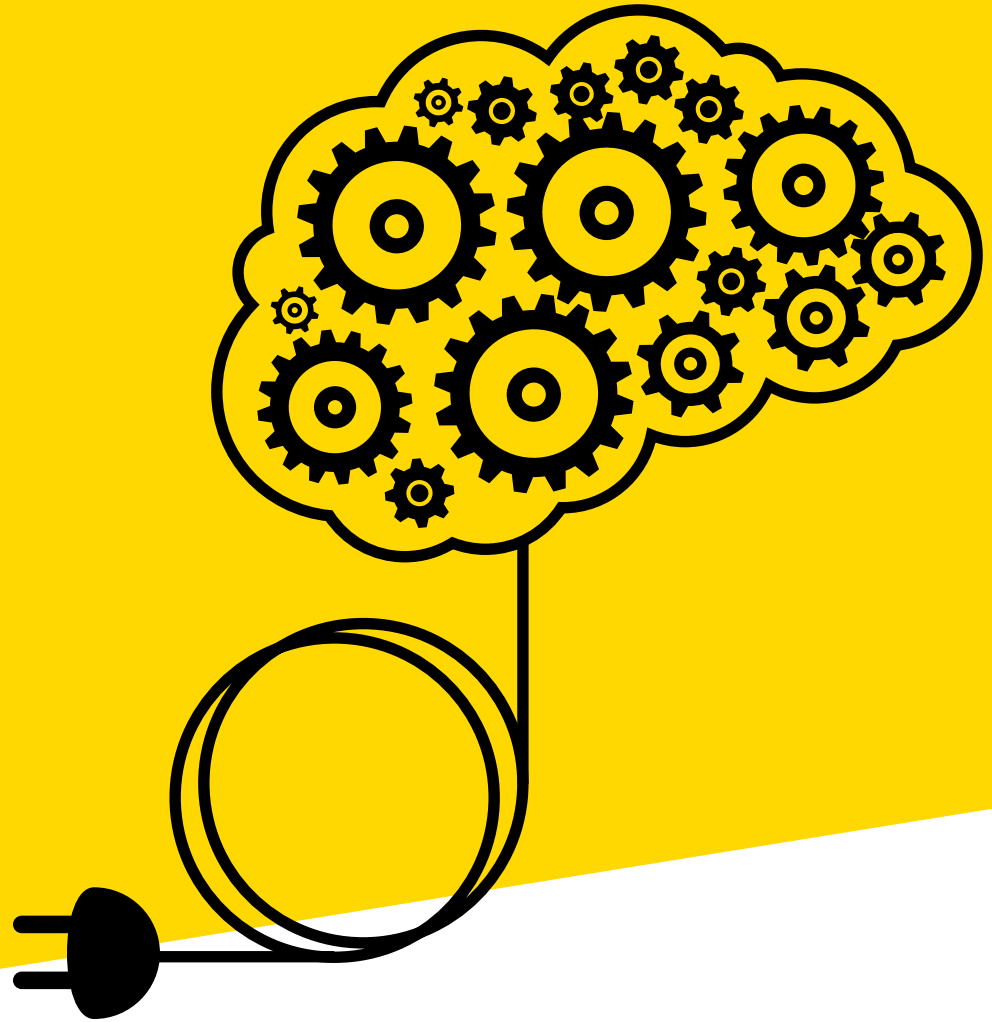


CLINICAL BOOKLET (family and friends)

Available on the website of the BRAIN toolkit:
www.cerveau.psy.ulaval.ca

Video vignettes are also available on this website.

If you have any questions about the BRAIN toolkit,
please write to caroline.cellard@psy.ulaval.ca



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