

COGNITIVE FUNCTIONS & CEREBRAL PALSY

**A guide to understanding the role of cognition in
children with CP**



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In collaboration with



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Please note that this booklet was designed specifically for Sweden. Some information may not be applicable in other places or settings.

Introduction

When taking care of children with cerebral palsy (CP), it is common to first think about the physical difficulties the child will encounter. However, the brain injury which causes the child's CP can sometimes also result in cognitive difficulties. Cognitive difficulties are not the same as lower intellectual functioning, although just over one-third of individuals with CP also have an intellectual disability (ID). Having an ID involves greater difficulty understanding and learning both theoretical and practical tasks compared with typically developing children. It is important to note that cognitive difficulties can be present among all aptitude levels. In addition, there is no clear relationship between the degree of motor difficulties and possible cognitive difficulties. This is why it is important for all individuals with CP and their families to be aware about the risk of cognitive difficulties.

Cognitive difficulties can be minor and might not affect everyday life to a great extent. They can also be so evident that they influence the child's opportunities to participate in social settings, get through school, or work when they grow up. Some children have very extensive difficulties and need lifelong support from the people around them.

What are cognitive functions?

Cognitive functions are mental processes in the brain, which--among other things--enable us to perceive, interpret, and process information; think; solve problems; understand language;

and communicate. There is great variation from person to person in how these mental processes work, and everyone has strengths and weaknesses in different areas.

Cognitive difficulties & CP

Cognitive difficulties can be an obstacle for individuals with CP in everyday life. Consequently, those close by can experience frustration, e.g., if the child forgets things or has difficulty concentrating. Unfortunately, some children feel worse than others when they do not succeed in activities and tasks that their peers can manage.

While the motor disability can make physical actions take longer to do, it can also take longer for individuals with CP to mentally process information. This requires more energy, and children with CP are often more tired than others after the school day, for example. Finding an everyday balance that includes both adequate effort and enough rest is usually important for individuals with CP. Many children need help prioritizing and opting out of activities in order to be able to participate in what is most necessary.

It is important for children to understand their own strengths and difficulties, as well as to receive help finding personalized strategies both at home and in school. The more you know as a parent/caretaker about your



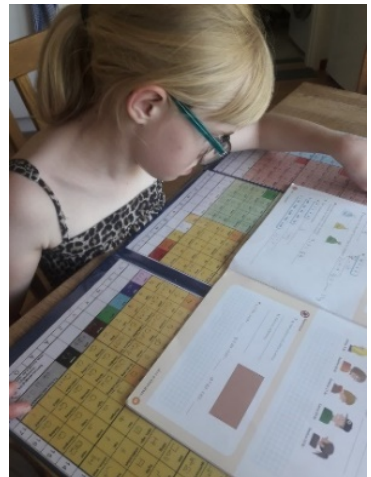
child's cognitive abilities, the better you can support the child's development and set reasonable expectations.

Common difficulties

Concentration, attention, and stamina

It is common for children with CP to have difficulty concentrating. This can become clear in an environment with a lot of disruption, such as in a preschool group or classroom. It can also be difficult to gather thoughts and maintain focus, even without external disruptions. For some, mental exertion means quickly getting tired or not having the energy that is expected from them. Concentration difficulties can thus occur due to several different reasons. To provide support, it is important that

- the child has the possibility to be in a calm environment when they need to concentrate,
- adaptations can be made for the child,
- the child is given the opportunity to take breaks, and
- the child knows when it is time to work and when it is time to rest.



This information can be provided through a clear daily structure, which, when appropriate, can be conveyed through images (e.g., augmentative and alternative communication) and time aids.

Memory

In CP, it is almost always the working memory that is affected, i.e., the ability to retain information for a shorter period to carry out a task. Problems with working memory can make it difficult to remember several instructions at a time, or to remember an instruction for as long as it takes to complete a task. In school, it is important to

- give one instruction at a time and follow up that the child has understood,
- give feedback often so the child knows that they are on the right track and does not have to redo anything because they forgot the instructions,
- NOT put energy into the memorization of tables, measures, weight and length units (it is better to accommodate with reference sheets instead),
- create security by providing a clear structure throughout the day, and
- communicate important information visually (this can enable the child to quickly look up information instead of requiring the child to ask again after forgetting).

In everyday life, it can be difficult to remember plans, e.g., having a play date or forgetting where they are supposed to hang their jacket. At home, it can be good to

- have a schedule for planned activities,
- have reminders on their phone,
- try to have the same daily routines every day, and
- discuss strategies together with the child, such as making it a habit to double-check that they have their textbooks before they leave school.

Having problems with working memory does not necessarily mean that the child also has other memory difficulties. The child may very well remember the course of events or learn information based on specific contexts.

Language

Linguistic difficulties can cause problems with speech. For example, the child may have difficulty pronouncing certain sounds, using language to communicate because they do not understand certain words, or staying on-topic. Some children also have a slow process of understanding and using language, in which case it is important to give them time to process and respond without interrupting them. It is possible to have speech difficulties without language difficulties and vice versa. Many children with CP need to see a speech therapist.

Visual perception and visuospatial functions

Perception involves interpreting and creating meaning from what we see, hear, and feel. In particular, visual-spatial perception problems are common for people with CP. Visual-spatial problems are not vision problems; they occur when the brain cannot interpret what one sees in a complete way. Note:

children with CP can also have vision problems, but this is separate from difficulties in perception. Visual perception problems can become apparent if the child has difficulty perceiving the content of images, interpreting facial expressions (especially nuances), or distinguishing something formatted on a busy background. Visual perception difficulties can indirectly affect several different functions. For example, it can make learning to read and write more complicated, but you can help your child by

- trying to keep their environment well-organized and tidy with everything in place,
- going through information verbally, and
- going through new environments in advance, including taking note of obstacles (e.g., holes in the ground).

Visuospatial ability is often influenced, particularly in bilateral CP. This involves limitations in the perception of space, which can imply difficulties assessing distance and direction, navigating an unknown environment, orienting by map, or gauging the speed at which something is moving. For small children, it can be tricky to put on clothes correctly or to find their things in cabinets and drawers. In traffic, it can, for example, be difficult to tell if a car is slowing at a pedestrian crossing. At school, it can be



challenging to stay on track with directions and movements in sports, as well as understand how to sew or carry out pattern or drawing tasks. In math, visuospatial difficulties can influence the understanding of relationships between numbers and geometric figures. Figures and graphs can also require a lot of effort to understand. You can help the child by

- having each item have its place both at school and at home,
- having assigned seating at school,
- color-coding drawers and shelves (when necessary),
- having clear teaching materials with little text on each page, and
- providing strategies for finding things.

Executive functions

Executive functions are the processes we use to have an overview of life, bring us from idea to action, plan, and use strategies. Here, most of our cognitive functions interact with each other so that we can implement what we want and need. For well-functioning executive functions, one needs to have a good working memory, the ability to overview, think about multiple things the same time, choose, and regulate one's own thoughts and impulses. Many children with CP have executive difficulties and, as such, problems putting ideas



into action. This can often entail having shortcomings in terms of perception of time, e.g., keeping track of how long it takes to do something. The ability to read a clock and understand time are not the same.

- Use other methods besides a clock, such as so-called time aids, to measure time in everyday life.
- Use calendars, schedules, and overviews to make clear step-by-step plans.
- Be sure to build solid routines and stick to them.

How can you help?

Problems within the different areas of cognition are often connected. For this reason, it is important that the child has the opportunity to receive a neuropsychological assessment in order to understand what makes certain activities go relatively smoothly and others more difficult. As people, we often compare ourselves to others, and if we do not receive accurate information as children, it can often lead to unfortunate misconceptions, which can affect self-image and self-confidence. How you inform the child of their difficulties and how much can be understood by the child should be adapted to the child's developmental level and maturity. Parents, preschools, and schools also need to know the child's aptitudes and functional limitations so that they can adapt the child's environment and learning as needed.

Within the follow-up program CPUP, neuropsychological assessments are recommended at least at ages 5-6 and 11-12

years. Such assessments are usually conducted at your local habilitation center but in some cases at school and can contain

- an aptitude test,
- a test for visual perception,
- an assessment for executive functions, and
- an assessment of functioning in everyday life (adaptive functioning).

Sometimes, all of these assessments are carried out, and other times, only the most relevant/appropriate measures are used to adapt for the individual child.

An assessment is often used in consultation and collaboration with a **habilitation team**. For example, it can be necessary to collaborate with the special educator to get good pedagogical strategies in play and school; an occupational therapist for assessments and efforts for increasing the child's skills in everyday activities; a speech pathologist to map out different types of language difficulties; and a physiotherapist to clarify the child's motor abilities and more. Occupational therapists and speech pathologists can recommend and prescribe aids for, e.g., time perception and communication.

Parents, habilitation units and preschools/schools can work together to give the child the best opportunities possible and assist in healthy development, with respect to a child's unique circumstances. This is a continuous process that needs to be adapted during childhood. During this process, it is important

to remember that development entails acceptance, and everyone has the right to be who they are. It is just as important to cultivate what is fun as it is to work on what is difficult.



Do the difficulties last forever?

Some cognitive difficulties may occur during particular developmental periods, while others affect the individual throughout their whole lifespan. When you are wondering about your child's cognitive difficulties, it can be helpful to raise questions you have with a psychologist at your local habilitation center.

The underlying brain injury which causes cognitive and motor difficulties in CP does not change over time. In sum, it is good to think about the difficulties your child experiences, and together, you and your child can benefit from finding support, strategies, and aids to help manage in day-to-day life. For most people, finding the right adaptations and support can make a big difference!



More information

This information booklet will be made available as a booklet and audio file in these languages:

- Amharic
- Arabic
- Dari
- English
- Finnish
- Somali
- Swedish

The audio files can be listened to on these home pages:

- www.cpun.se
- www.cpsverige.se

For more information about cognition and CP and CP in general, you can visit CPUP's website:

- www.cpunp.se

CPUP is Sweden's follow-up program and national quality register for individuals with CP. CPUP strives for early detection and prevention of hip dislocation in individuals with CP, other complications associated with CP, and more.

- www.cpsverige.se

CP Sverige (CP Sweden) is a diagnostic association for individuals with CP and their relatives as well as for people who work to improve the situation for individuals with CP and their families in various ways.

CP Sverige considers it very important for all children with cerebral palsy in Sweden to be offered cognitive assessments. This enables the early detection of cognitive difficulties, which can help give the child the right support in school and leisure activities at an early stage.





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