PACE

Processing and Cognitive Enhancement

Purpose and Background

The Processing and Cognitive Enhancement (PACE) program was developed to train cognitive learning skills. It is what many affectionately refer to as "mental boot camp."

To train cognitive learning skills, PACE applies the most recent scientific research on learning. Too often, this type of information sits on universities' shelves and may not be applied until many years later. Or, the information is ignored because it would require one-on-one instruction, which most educators cannot afford to give. PACE is at the forefront of making sure the most up-to-date information is used.

PACE was founded and is directed by a group of professionals from a variety of disciplines who have a common interest in helping children learn more easily and efficiently. Included in this group are psychologists (in the areas of neuropsychology, cognitive psychology, and clinical psychology), specialists in vision and auditory processing, and educators.

Prior to PACE, a number of its founders were involved in a pilot program which was located in over 200 health care offices across the United States and Canada. The results were outstanding! The training had a significant impact on the learning skills and lives of the thousands who participated in the program. However, the pilot program was designed for a more limited purpose, and many children had needs that were not being addressed. Therefore, PACE was developed.

Although PACE is similar to the pilot program, it goes beyond this earlier program in some important ways. PACE includes modifications and additions that have enhanced the program considerably. Also, the cost of the training was cut so that it is now only half the cost of most other therapies. This makes PACE affordable to virtually anyone who can benefit from the program and wants to enhance their learning skills.

Those Who Can Benefit from PACE

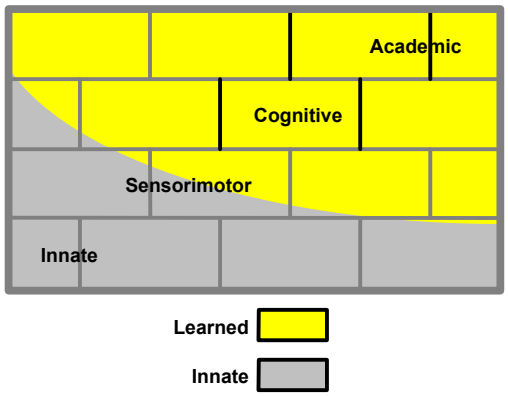
Those who can benefit from the program include high or average performers who want to perform mental activities faster and more efficiently, and even better than before, as well as below average performers who have learning difficulties. The information in this brochure will focus on the below average performer. This type of child usually has one or more of the following symptoms which do not seem to improve with just extra work and tutoring:

- trouble staying on task
- working too slowly or too hard
- difficulty comprehending what is read
- problems remembering
- poor reading, math, or spelling skills

PACE and the Learning System

PACE is different from some other approaches to learning problems. To understand PACE, one must first understand the different levels of learning.

The following chart lists the four main learning levels.



At the bottom, there is the *innate stage*. This stage represents the genetically determined abilities we have when we enter this world such as learning to crawl, stand up, grab, and walk. These reflexes and processes are the result of inborn capabilities and muscle development. They are part of all healthy development.

Based upon these innate capabilities are *sensory and motor skills*. Sensory skills are skills such as seeing and hearing. They are responsible for receiving information. Motor skills are related to muscles and movement. They include moving, speaking, and writing. These skills handle our responses to the information our senses receive. Both sensory and motor skills are partly determined by the genetic code and partly learned by our interaction with our environment. They can be practiced and trained.

Based upon sensory and motor skills are *cognitive abilities*. These abilities allow us to process the sensory information we have gathered. Processing includes our abilities to attend to, discriminate, analyze, evaluate, and compare information; to recall experiences; and to determine a plan of action. These skills are almost completely learned and are determined by our interaction with our environment and other people.

The top level on our chart is *academics*. These abilities are the result of instruction in areas such as algebra, reading, and typing. These abilities are not likely to develop on their own, but require teaching. Academic skills are dependent upon the underlying cognitive skills.

So where does PACE fit in? It enhances the cognitive abilities level.

Schools, learning disabled (LD) programs, remedial reading, and tutoring all work at academic retraining. Sensory and motor therapies, such as auditory, vision, occupational, and physical therapies, concentrate at the sensory and motor level.

PACE concentrates on those cognitive abilities that process sensory information and that the academic level relies upon. So PACE does not teach academic content, but it will help make learning easier and faster.

Causes and Symptoms of Children with Deficient Cognitive Processing Skills

For children who are having difficulty learning, the cause could be any one or more of the following: a problem seeing or hearing information, problems expressing themselves through speech or writing, a lack of motivation, a lack of proper instruction, or poor cognitive processing skills.

Learning problems are seldom primarily caused by seeing, hearing, or speech disorders. (It's not in gathering the information but in processing it that the problem usually rests. Ray Charles is blind, but he certainly can perform!)

And although a lack of motivation is probably related to the learning problem, it is often a result of the problem — not a cause.

If you had to do something that was always hard for you, and you almost always failed, you too would become frustrated and avoid the task. There are only so many times that you will try to run through a brick wall before

quitting. It hurts too much.

Many children experience the same pain with school work. There are very few children who enter school without expecting to succeed. So when they don't succeed and keep getting hurt in their attempts, they start to avoid the pain.

If a child's learning problem is just a lack of instruction, then some extra help or tutoring will help the child catch up. That is all that is required, and PACE is not needed because the problem is not related to poor cognitive processing skills, but to a lack of academic instruction.

There are many children who struggle to learn even with adequate instruction; however, these are the children who most likely have a cognitive processing problem. They tend to:

- have trouble paying attention and staying on task
- become easily distracted
- reverse letters and words
- forget instructions or what was read earlier
- take a long time to complete a task
- keep making the same careless errors repeatedly without realizing it
- have difficulties sounding out words and spelling
- have problems creating mental pictures from a word math problem
- struggle to understand or comprehend what was read
- do things that don't seem to make sense.

Because of these processing problems and the resulting frustration, academic performance, self-esteem, and relationships with family and peers will suffer. If something is not done to correct these deficiencies, the effects will be drastic and could impact future education and vocation choices, as well as earning power.

Tests and Symptoms

At PACE we do not assume that all learning problems are the result of poor cognitive processing skills or that all children need cognitive training. Instead, we use assessments that probe different areas of processing to see if there are any deficiencies that we can address. Some of the skills we look at include the following:

Attention: the ability to stay on task, even when distractions are present.

Simultaneous Processing: the ability to handle more than one thing at a time (e.g., the ability to recognize a word without sounding it out, to listen to the instructor while taking notes, or to drive a car while carrying on a conversation).

Sequential processing: the ability to link a series of inputs over time (a skill required for reading so that the beginner can blend a series of sounds to create words and the advanced reader can link a series of words to understand the story or idea).

Planning: the ability to decide how you are going to solve a problem, make sure it gets done, check it for mistakes, and modify it if needed.

Processing speed: the ability to perform cognitive tasks quickly; an important skill for complex tasks or tasks that have many steps (e.g., if we are dividing two numbers in our head but processing is slow, we might forget

an earlier calculation before we are done and have to start over again — we took longer to do the problem than our ability to remember).

Short-term Memory (STM): the ability to store and recall small amounts of information about the current situation. Children with STM problems may need to look several times at something before copying, have problems following instructions, or need to have information repeated often.

Long-term Memory: the ability to recall information that was stored in the past when needed. It's very important for spelling, recalling facts on tests, and comprehension.

Auditory processing: the ability to perceive, analyze, and conceptualize what is heard. It's critical in beginning reading and spelling because it includes hearing, identifying and blending sounds, and sounding out words.

Visual processing: the ability to perceive, analyze, and think in visual images. This includes visualization, which is the ability to create a picture in your mind. Children who have problems with visual processing may reverse letters or have difficulty following instructions, reading maps, doing word math problems, and comprehending.

Cognitive Skills are Learned and Can Be Improved

The cognitive skills discussed previously are learned and therefore can be improved.

We know that cognitive skills can be enhanced not only because we can see the changes through observation and tests, but also because there is evidence derived from brain research as well.

Recent research suggests that stimulating the mind with mental exercise may cause brain cells, called neurons, to branch widely. This branching causes millions of additional connections, or synapses, between brain cells. Arnold Scheibel, the former director of UCLA's Brain Research Institute, suggests that we think of it as a computer with a bigger memory board that allows you "to do more things more quickly."

Other studies demonstrate that our brains develop throughout our lives and that they are constantly being modified. For example, Michael Merzenich trained a monkey to touch a rotating disk with the three middle fingers of its hand. After several thousand times, the monkey's brain expanded in the areas that are designated for the three middle fingers (at the expense of those areas designated to the other two fingers). This expansion proves that training and practice can stimulate
brain development.

In addition, *Life* magazine recently featured the idea of "Brain Calisthenics" in the article "Building a Better Brain." The article stated, that "evidence is accumulating that the brain works a lot like a muscle — the harder you use it, the more it grows. Although scientists had long believed the brain's circuitry was hard-wired by adolescence and inflexible in adulthood, its newly discovered ability to change and adapt is apparently with us well into old age. Best of all, this research has opened up an exciting world of possibilities."

These studies show that by using proper training methods, one can target, modify, and develop the brain to improve deficiencies. And the fastest and most efficient way to do this is through cognitive training exercises that specifically and directly target a deficient skill.

PACE focuses on enhancing and improving those processing skills that will bring about the biggest impact on learning. The processing skills that will do this are the deficient cognitive skills underlying the learning problem.

However, if a child's problems are not caused by poor cognitive skills, then PACE will be unable to help. But we will do all we can to help you get the proper help elsewhere. Moreover, PACE does not tutor or teach school subjects. Rather, we help develop the underlying skills that can make a significant impact on your child's ability to learn so that he or she will have the chance to catch up.

PACE Program

The PACE program is a twelve-week, intense, one-on-one, cognitive training program that corrects and enhances learning skills.

Condensed Length

Unlike programs that take 12 to 18 months and produce very gradual changes, the PACE program makes very significant changes in only 12 weeks. This is extremely important because... the child must see changes.

If a child sees changes in his or her performance, it will raise the child's self-esteem. This will make the child want to work at improving his or her skills even more. In fact, by the second session, all patients in PACE — even those in kindergarten — are able to name the presidents of the United States forwards and backwards. This technique develops memory and visualization strategies and improves the ability to create mental images.

We then ask the child to go to school and recite the presidents in front of the class. This does amazing things for the self-esteem of a young child who normally struggles in school. Teachers, peers, and parents will know the child's abilities are far greater than before, and so will the child. As a result, self-esteem will soar!

Intense Sessions

One-on-one training is extremely important, especially when one considers that a child in public education in the United States gets only an average of six and a half hours of one-on-one instruction over a 13 year period. PACE provides 60 to 80 hours of one-on-one training over 12 weeks.

There are two reasons for one-on-one training. The first is feedback. When the child does something correctly, he or she is praised. When the child makes an error, he or she is made aware of it so that it can be corrected. Immediate feedback allows faster learning.

The second reason for one-on-one training is sequencing. Sequencing means the program is personalized to the child's deficiencies and needs. If a task is too difficult, the child will become frustrated. If the task is too easy, the child will become bored. So the therapist designs the task to be challenging and then slightly increases the demand of that task to force the deficient skills to improve.

It's very intense, but children love intensity. Think about the hours that children spend playing video games like "Mario Brothers." These games are based on sequencing and immediate feedback.

Parental Involvement

comment made by parents. In fact, sixty percent of the parents we see at the end of training comment on the improvement in their child's self-image and attitude.

Fees

If we can help your child, we'll discuss the fees during the consultation. However, you should know that fees vary depending upon the degree of parental involvement. Also, our fees are about half the cost of other types of training.

Commitment

First, both parents need to understand the problem the child has and the consequences those problems could have on the child's life.

And second, we need to know the parents' degree of involvement and the time they are willing to commit to help us help their child. Unless we believe that your child can make significant improvement, we will not start your child in the program.

National Advisory Board