Processing and Cognitive Training for Literacy Development

(PACT)

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An Initiative by Literacy Care

By Dr Jason McGowan (Ed.D)

Simply put **PACT** is a **brain-training program for enhancing mental skills**. This means that it focuses on the development of the underpinning nuerological processes that are essential for literacy development. Functional Magnetic Resonance Imaging (fMRI) technology has helped researches to understand how the brain functions when a child engages in the reading process. It is now known that there is one reading system at the front of the brain, two at the back and three on the left side (Shaywitz 2004). As a result of this type of research it has become possible to formulate activities that promote brain function in the areas responsible for reading. Even though the research is in its early stages and it is still not appropriate to use brain imaging technology to diagnose reading disorders it has allowed for a lot of successful experimentation in the areas of processing and cognitive enhancement. Therefore it is now possible to implement programs that not only address reading in a procedural "how to" way but also programs that aim particularly at processing enhancement. **PACT** is one such program. It is designed to build underlying learning skills to provide the learner with better neurological "tools" to help them develop competency across the key literacy areas.

What's PACT All About?

Firstly, what PACT is NOT? PACT is *not* like schoolwork. It is *not* academic. It doesn't teach subjects like math and history and social studies. It works on the underlying learning skills, that is, the mental tools that are necessary for success in those academic subjects.

PACT involves fun mental exercises that are really more like mind games. As capabilities improve, and higher levels of skill are attainable, multiple skills are required. Some of the procedures involve accuracy while others involve working against the clock. Concentration, therefore is a must.

What's the Principle Behind PACT?

PACT strengthens the "muscles" in your mind; therefore you're forced to get stronger. It's like lifting weights. A light barbell won't increase your overall lifting strength. Your body training exercises must involve weights that are just a little bit heavier than you're used to so your muscles can grow. This is known as the principle of progressive or controlled overload. Just

like a muscle the brain enlarges in the cerebral cortex allowing for the activation of neurons and the forging of new synapses as new information is received and stored.

PACT pushes you to exert a little more in each training session. Consequently, your mind's "muscles" get stronger.

What Are The Learning Skills That PACT Targets for Improvement?

There are at least 24 major learning skills that PACT can enhanced including visual and auditory processing, attention, comprehension, logic and reasoning, and memory capabilities. A full list with definitions can be found in appendix A (Pg.5)

What Learning Problems Can Benefit From PACT?

People of all ages have learning problems. Many of them struggle with, and often avoid, academics, studying, and even on-the-job training. They include people, especially children, who have been diagnosed as "Dyslexic," "ADHD," and "Learning Disabled or some other specific learning disability. Children with poor phonological processing, particularly those that have poor phonemic awareness, phonological memory and rapid naming skills, also benefit from PACT. These skills are often identified in people with low level reading ability.

Why is PACT So Effective?

Training that is deliberate and tailored to meet individual needs can the brain's cognitive processes. Recent research shows that the mind, with mental exercise, causes brain cells, called neurons, to branch widely. That is, they expand and grow. This branching causes millions of additional connections (called synapses) between brain cells. Dr. Arnold Schneibel, the former director of UCLA's Brain Research Institute, suggests that we think of brain growth as a computer with a bigger memory board that allows us to "do more things more quickly." This increase in processing speed and memory capability is the essential goal of PACT

What Results Can Be Expected From PACT?

Gains may be expected in the areas listed above and those in appendix A. Even if a student has not been identified as learning disabled in specific skills, there can be improvement beyond the current levels.

Typically, over the period of the learning skills training research has shown that an average improvement of 3.6 years can be achieved. Frequently post-training test scores are quantum leaps above pre-training scores. With students who make reversals of letters and words while reading, there has been an average improvement of 87%. In 12 weeks of training, average advances in learning techniques have revealed 4.6 years gained in concentration, 3.5 years gained in comprehension, over 5 years gained in phonemic awareness (the most important

underlying skills). These results were measured using accepted standardized test instruments.

What Difficulties Can Arise?

PACT isn't for everyone. These special words of caution are intended for people, in particular, who may fall into one of four categories of concern.

Uncooperative:

If the student is resistant to training, or to the trainer, either beforehand or becomes resistant during the program then results will be compromised.

Undisciplined:

Diligence is required of both the student and the trainer. The training schedule must be maintained and the program completed in full.

Premature:

If the student is too young (Less than 6 years of age) then many parts of the program will either be conceptually to difficult for them or they will not have the necessary attention and concentration power to get meaningful bouts of work completed.

Misdirected:

If there are untreated complex behavioural or other untreated biomedical conditions as well as the learning disability then PACT will probably have a reduced affect. It is also not suitable for those children with intellectual impairment. Ideally, the behavioural, psychoemotional and other social and mental difficulties, including attention and concentration deficits should be under full management before a student participates in PACT. Provided such conditions don't impede the child's ability to pay attention, concentrate or otherwise physically complete the training then PACT should have the desired affect.

How is PACT Accomplished?

Fundamentally two people, a trainer and a student must be willing to work together to achieve a desired goal.

Both participants need to understand the good they can accomplish together and the learning barriers they can overcome. Good grades and learning for fun can be within their reach, even for students who have become frustrated and, perhaps, shuffled off to the side where there's a lot less hope for their future. It is essential that both the student and mentor understand that there is both a time and effort commitment required for the effective implementation of PACT.

In relation to time a period of 45 minutes 5 days a week for 6 weeks is necessary for acceptable gains. PACT requires video-game-intensity, one-on-one, so both the student and the trainer have to make the same commitment – to themselves and to one another. This is not like saying, "Go do your homework." Both of you must roll up your sleeves and be actively involved. It's work, but it's worth it. Don't pass by this necessity too quickly. Unwavering commitment that delivers uninterrupted and sustained effort throughout the work period is essential for success.

Why Is Sticking To the Training Schedule So Important?

Progress:

It's important for the student to experience maximum change as quickly as possible. They need to see and feel the change. It will be of immeasurable value.

Retention and Automation:

The minimum 6-week training schedule is necessary for adequate long-term retention and automation of the new skills that will be learned or strengthened. In follow-up testing one year after training, a retention rate of 98.7% of the new learning skills for students who completed the training as directed was measured in recent studies.

If the schedule is *not* kept, change will *not* be as noticeable. Maximum success is jeopardized. Accepting this fact needs to be part of a clear and agreed understanding between the child and the mentor.

What Happens To the Mind During PACT?

Fundamentally, what PACT procedures and exercises do is draw to the conscious level the habitual underlying learning skills. While you are working with these skills consciously during PACT, they are refined and strengthened, then forced back to the subconscious. Then when you use those skills, you'll be faster and better.

PACT has a positive impact because it's **intense**, **one-on-one**, **sequenced, and targets the weakest skills**. The required exercises are really like physical therapy for the brain. We know how well our minds respond to games and contests. It's stimulating and satisfying. When we succeed, it's something we want to do again and again. As we repeat the tasks, we get reinforcement. New skills are strengthened and made automatic.

The human mind trains itself in this way. In PACT it's just more deliberate and the brain is targeted for an intense workout for short bursts of time.

Here's a good example of how PACT works:

Subconscious Skills: When first learning to touch-type, you have to think very deliberately about what each of your fingers is doing on the keyboard. As you practice more and more, placement is no longer a conscious effort.

With just a little bit of practice, typists are no longer aware of what their hands are doing. It works exactly the same for skating, driving a car, playing video games, and many other skills we acquire. That's exactly what PACT is like - but targeting very specific learning skills.

When administered alone PACT has shown to have exceptional results. However there is mounting evidence that when PACT is used in conjunction with a multisensory scientific evidenced based literacy intervention the results in terms of functional improvement to a student's reading ability is vastly increased. Remember that cognitive training programs prepare the mind for learning by helping the student overcome their learning difficulties. They do not teach scholastic and academic skills like reading and spelling. These skills are acquired and do not come naturally. Therefore once a student has been through the preparation process offered by PACT they must then engage in a skilling process.

If you have further questions about PACT please contact Dr Jason McGowan at your earliest convenience.

GOOD LUCK

Appendix A

Learning Skills Enhanced By PACT

Auditory Processing	To process sounds. This is the major underlying skill needed to learn to read and spell.
Auditory Discrimination	To hear differences in sounds such as loudness, pitch, duration and phoneme.
Auditory Segmentation	To break apart words into their separate sounds.
Auditory Blending	To blend individual sounds to form words.
Auditory Analysis	To determine the number, sequence, and which sounds are within a word.
Auditory-Visual Association	To be able to link a sound with an image.
Comprehension	To understand words and concepts.
Divided Attention	To attend to and handle two or more tasks at one time. Such as taking notes while listening, carrying totals while adding the next column. Required for handling tasks quickly as well as handling complex tasks.
Logic and Reasoning	To reason, plan and think.
Long Term Memory	To retrieve past information.
Maths Computations	To do maths calculations such as adding, subtracting, multiplying and dividing.
Processing Speed	The speed in which the brain processes information.
Saccadic Fixation	To move the eyes accurately and quickly from one point to another.
Selective Attention	To stay on task even when distraction is present.
Sensory-Motor Integration	To have the sensory skills work well with the motor skills – such as with eye-hand co-ordination.
Sequential Processing	To process chunks of information that are received one after another.
Simultaneous Processing	To process chunks of information that are received all at once.
Sustained Attention	To be able to stay on task.
Visual Processing	To process and make use of visual shapes.
Visual Discrimination	To see differences in size, color, shape, distance, and orientation of objects.
Visual Manipulation	To flip, rotate, move, change color, etc. objects and images in ones mind.
Visualization	To create mental images or pictures.
Visual Span	To see more/wider in a single look.
Working Memory	To retain information while processing or using it.