



02 **COGNIPLUS**

Training cognitive functions

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For the sake of readability the masculine form has been used throughout to designate both genders.

CogniPlus? CogniPlus!

COGNIPLUS is a product of the SCHUHFRIED company – your specialist in computer-based psychology.

COGNIPLUS is a training system for training cognitive functions. Efficient. Multi-media. Motivating.

COGNIPLUS is scientifically based and incorporates up-to-date psychological findings. The content of CogniPlus is closely linked to the Vienna Test System – internationally the most widely used test system for professional psychological assessment. This means that diagnosis, treatment and evaluation can be efficiently linked.

COGNIPLUS is available in a wide range of languages – at no extra cost. So that each client can train in his own language.

You too can profit from a state-of-the-art program that covers all areas of cognitive training!

Read more _____
... about the interlinking of **COGNIPLUS** and the **VIENNA TEST SYSTEM**.
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... about the language versions.
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NEW NEW NEW NEW NEW

Lots of new features in CogniPlus!

NEW

6 NEW CogniPlus training programs!



CODING

Working memory
Spatial and temporal encoding

→ [read more on page 16](#)



PLAND

Executive functions
Planning and action skills

→ [read more on page 20](#)



NAMES

Long-term memory
Learning of face-name associations

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VISP

Working memory
Visuo-spatial

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ROTATE

Spatial processing
Mental rotation

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HIBIT

Executive functions
Response inhibition

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NEW a special feature for greater convenience!

DIRECT TRAINING:

fully automated administration of training
without a supervisor

→ [read more on page 27](#)

7 reasons to choose CogniPlus

1 | Developed by prominent scientists

Many prominent scientists, including Prof. Walter Sturm, Prof. Joachim Funke and Prof. Matthias Weisbrod, have worked with experts at SCHUHFRIED to develop CogniPlus. Extensive experience combined with the know-how of the best of the best makes CogniPlus one of the most advanced cognitive training programs on the market today.

Worth knowing

Prof. Dr. Walter Sturm has been head of the clinical neuropsychology department at the neurological clinic of the medical faculty of RWTH Aachen University since 1995. His main areas of research are neuropsychological assessment, treatment of attention disorders, functional reorganisation after attention therapy and functional imaging of attention functions.

Firm foundations: In 1993 Prof. Sturm and his colleagues developed the AIXTENT training program for the treatment of attention disorders. Efficiency studies showed that training must be deficit-specific if it is

to be effective. Building on this insight, SCHUHFRIED worked with Prof. Sturm to produce a second-generation version of AIXTENT (AIXTENT II), which later became known as CogniPlus.

2 | Based on a deficit-oriented intervention approach

Each CogniPlus training program is tailored to a specific deficit, because studies have shown that use of over-complex training programs may actually cause performance to deteriorate. Training programs are only offered for cognitive functions that are scientifically proven to be trainable.

3 | Embedded in a context of scientific theory

CogniPlus training programs are always developed in the light of the relevant up-to-date scientific literature. Theory-led design is a top priority. All our partners are noted for their theoretical expertise as well as their practical clinical experience.

4 | Realistic and motivating design

Clients want to apply their improved skills as quickly as possible in everyday life. In CogniPlus the ability dimensions being trained are almost always embedded in lifelike scenarios. This has been achieved through collaboration with computer game programmers, who have produced impressive three-dimensional scenes. It is this appealing, modern and motivating appearance that makes CogniPlus popular with clients.

5 | Adapts automatically to the client's ability

CogniPlus is an intelligent interactive system which is neither too easy nor too difficult for the client. It reliably identifies the client's ability level and adapts automatically to it. One of the conditions for successful training is thus met: the users of the program are motivated.

6 | Training at all ability levels

The CogniPlus training programs can be used across the entire ability range. This opens up completely new opportunities for use alongside the traditional areas of application such as the rehabilitation of patients with brain damage. For example, CogniPlus can be used to improve the driving-related skills of people convicted of traffic offences, to improve the attention of children with ADHD, or to improve the mental activation of patients with MCI.

7 | Recommended by respected institutions

The attention trainings of CogniPlus are listed with recommendation strength A in the guidelines of the Society for Neuropsychology (Gesellschaft für Neuropsychologie – GNP, 2009) and the German Society for Neurology (Deutsche Gesellschaft für Neurologie – DGN, 2008).

RECOMMENDATION
STRENGTH **A**



7 reasons to choose SCHUHFRIED

1 | SCHUHFRIED has experience

The SCHUHFRIED company, founded in 1947 as a family business, has more than 60 years' experience behind it. Today the company leads the world in computer-based psychological assessment. Each year SCHUHFRIED's Vienna Test System is used around 12.5 million times to administer tests

2 | SCHUHFRIED operates internationally

36 distributors. Used in 67 countries. SCHUHFRIED is at home all over the world. And it knows where its roots are. Everything is still coordinated from the headquarters in Mödling on the outskirts of Vienna (Austria), where modern psychology first emerged many years ago.

3 | SCHUHFRIED wins awards for excellence

'Quality by competence' has been SCHUHFRIED's motto for many years. The company received ISO 9001 certification in 2003 and has been awarded the Austrian coat of arms. This is the highest award granted in Austria and is only awarded to businesses that can demonstrate a high level of exports, a first-class credit rating, innovative ability, good quality management and significant investment in research and development.



4 | SCHUHFRIED has good contacts

SCHUHFRIED works with experienced experts in every relevant field – scientists, computer specialists and marketing gurus. At congresses, symposiums and specialist events SCHUHFRIED networks with the other major players in the sector, so that it is always in touch with the latest trends. Or setting the trend itself.

5 | SCHUHFRIED specialises in computer-based psychology

The success of SCHUHFRIED products is built on the unique interplay between the three strands of psychology, hardware and software. All its products are developed in-house, closely coordinated and continuously improved. The importance of product development at SCHUHFRIED is reflected in its expenditure on research and development, which accounts for more than 25 percent of its annual turnover.

6 | SCHUHFRIED systems are simple and user-friendly

Using new technology can be a daunting prospect. Why not carry on using the old familiar methods, such as paper-and-pencil tests? SCHUHFRIED makes new ventures simple. Its systems are easy to use and have many advantages. So the results of tests and training programs are generated automatically, available immediately and guaranteed to be accurate. Because time is money!

7 | SCHUHFRIED is a strong partner

SCHUHFRIED goes the extra mile for its clients. The sales team is the first point of contact and can turn many questions asked into questions answered. The Help Desk helps with technical queries. Psychologists are available to answer questions on psychological matters. This is appreciated by many businesses and organisations, including:

- › 2,600 clinics, hospitals and rehabilitation centers
- › 1,400 self-employed users
- › 1,250 units in private companies and recruitment agencies
- › 1,350 units in traffic examination centers
- › 530 universities
- › 250 units in airlines and flight training centers
- › 13 military institutions

assions

The CogniPlus training programs

DIMENSION	SUBDIMENSION	SPECIFIC FUNCTION	COGNIPLUS-TRAINING
Attention	Intensity	Alertness	ALERT ➤ read more on page 9
		Vigilance	VIG ➤ read more on page 10
	Selectivity	Selective attention	SELECT ➤ read more on page 11
		Focused attention	FOCUS ➤ read more on page 12
		Divided attention	DIVID ➤ read more on page 13
Neglect/ visual field training		Visuo-spatial attention	SPACE ➤ read more on page 14
Memory	Working memory	Visuo-spatial	VISP ➤ read more on page 15
		Spatial and temporal encoding	CODING ➤ read more on page 16
		Updating – visual	NBACK ➤ read more on page 17
	Long-term memory	Learning of face-name associations	NAMES ➤ read more on page 18
Executive functions		Response inhibition	HIBIT ➤ read more on page 19
		Planning and action skills	PLAND ➤ read more on page 20
Spatial processing		Mental rotation	ROTATE ➤ read more on page 21
Visuomotor skills		Visuomotor coordination	VISMO ➤ read more on page 22

The range of CogniPlus training programs keeps growing!

Visit www.schuhfried.com for the latest information.

Attention: Alertness **ALERT**

Walter Sturm © SCHUHFRIED GmbH

The ALERT training program trains the alertness dimension of attention – the ability to temporarily increase and sustain the intensity of attention.



Theory

When the intensity of attention is temporarily aroused exogenously by a warning signal, phasic alertness is involved. If the arousal occurs without a cue, the situation involves intrinsic alertness. The aim of alertness training must be to increase intrinsic alertness, since only in this case is arousal entirely cognitively controlled. However, where there are deficits related to alertness it is necessary to first improve phasic alertness and only then to proceed to working on intrinsic alertness.

Setting and task

A motorcycle is driven along a winding road. The client's task is to carefully observe the stretch of road in front of him and to press the reaction key as quickly as possible when obstacles appear. If the client reacts in time the motorcycle slows down and the obstacle disappears so that the rider can continue on his way. If the reaction is delayed there is an "emergency stop"; there is a loud braking noise, the motorcycle comes to a halt and a yellow exclamation mark appears on the screen.

Training forms

The ALERT training program consists of two training forms. The S1 training form trains phasic alertness, while the S2 training form trains intrinsic alertness. In the S1 training form the obstacles designed to externally arouse the client's attention are preceded by acoustic and visual warning signals. In the S2 training form

the acoustic and visual warning signals are omitted. The motorcycle then travels through a foggy night-time landscape, in which the obstacles suddenly appear out of the mist.

Difficulty structure

Each of the two training forms contains 18 difficulty levels. The degree of challenge is increased by shortening the maximum permitted reaction time. At the first level the client has 1.8 seconds in which to react to an obstacle, but at the highest level only 0.3 seconds elapse between the sudden appearance of an obstacle and the emergency braking.

At the first session the speed of the client's initial reactions is assessed and he is assigned to a difficulty level appropriate to his ability. This ensures that from the outset the training program is optimally adapted to the client's skill and is never either too easy or too difficult for him.

Worth knowing

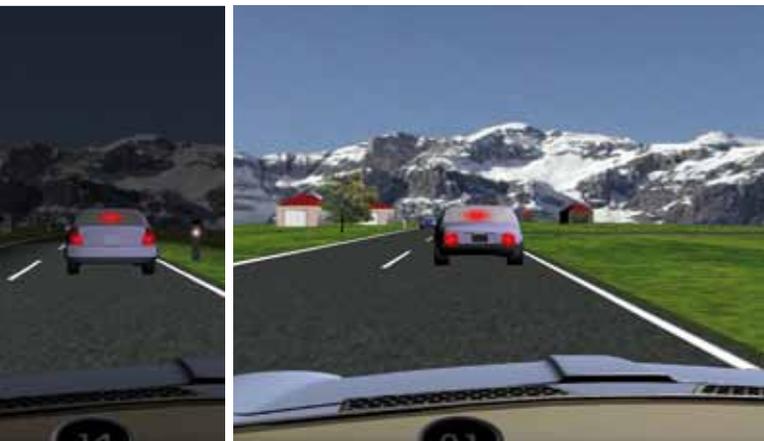
ALERT can also be used with patients with disorders of the field of vision. The instruction pages are then displayed on one side of the screen and the obstacles only appear on one side (e.g. trees only fall onto the carriage-way from the right).

Corresponding test in the

VIENNA TEST SYSTEM
WAFA

VIG Attention: Vigilance

Walter Sturm © SCHUHFRIED GmbH



The VIG training program trains the attention dimension of vigilance – the ability to sustain attention over a lengthy period of time under monotonous stimulus conditions.

Theory

Long-term alertness tasks require the client's attention "to be focused continuously for long periods of time on one or more sources of information, in order to detect and respond to small changes in the information presented" (Davies et al. 1984). Vigilance represents a special variant of long-term attention. Vigilance tasks make demands on attention over a long period of time – often

Worth knowing

VIG can also be used with patients with impaired field of vision.

a number of hours – and the relevant stimuli typically occur at very irregular intervals and at a very low frequency among a large number of irrelevant stimuli. Vigilance training cannot be effective unless a training session lasts for more than 30 minutes at the minimum.

Setting and task

The client is driving along a straight highway. At irregular intervals other vehicles come towards him on the opposite carriageway or overtake him. The client's task is to react by pressing a button when an overtaking vehicle suddenly brakes in front of him. Once he has reacted the vehicle's brake lights go out and it accelerates away from him. If the client fails to react within the permitted time, the brake lights start to flash. Eventually there is a loud squealing noise, which is designed to draw the client's attention to what is happening.

Difficulty structure

The VIG training program has 30 difficulty levels. A decreasing stimulus frequency makes it more and more difficult for the client to sustain his attention: he is overtaken by other cars increasingly rarely, the surroundings become more monotonous as darkness falls and the number of sudden braking manoeuvres from overtaking vehicles decreases. In addition, the intensity of the feedback on delayed and omitted reactions becomes weaker as the difficulty level increases. The challenge therefore changes gradually from a sustained attention task to one requiring real vigilance.

At each difficulty level the maximum permitted reaction time adapts to the speed of the client's reactions. Taking the client's first valid reactions as a starting point, an individual reaction time limit is determined and used as a basis for measuring all further reactions made in the course of the training program. This ensures that from the outset the training program is optimally adapted to the client's skill and is never either too easy or too difficult for him.

Corresponding test in the

VIENNA TEST SYSTEM

WAFV

Attention: Selective **SELECT**

Walter Sturm © SCHUHFRIED GmbH

The SELECT training program trains selective attention – the ability to respond quickly to relevant stimuli and to suppress inappropriate responses.

Theory

An attention selectivity training program should help the client to distinguish rapidly between relevant and irrelevant aspects of a task. Most selective attention tasks require a quick decision within a set of stimuli in which the relevant and irrelevant items are clearly defined.

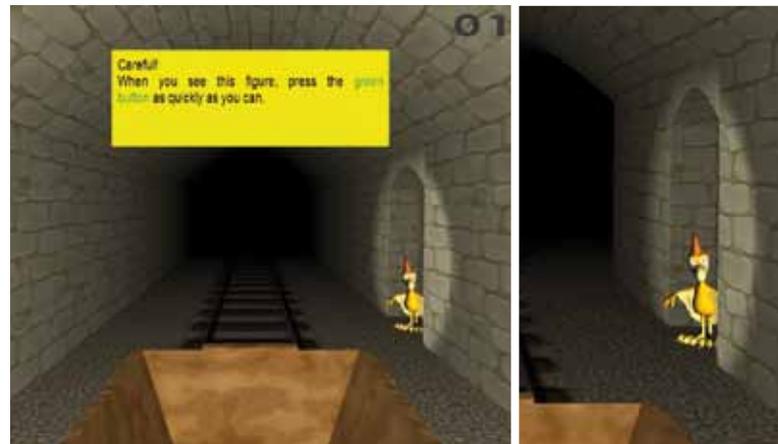
Setting and task

The client travels through a tunnel in a mine car. Relevant and irrelevant stimuli (optical, acoustic or crossmodal) suddenly emerge from the darkness. The client's task is to respond only to relevant stimuli. If he responds late to a relevant stimulus or fails to respond at all, negative feedback is given in the form of a crash of thunder and a flash of lightning. If the client responds in error to an irrelevant stimulus, the figure or the sound source is illuminated in red.

Training forms

The SELECT training program consists of three training forms.

- The S1 training form trains selective attention in the visual modality (figures appear in the tunnel).
- S2 is the acoustic training form, in which the client's task is to respond to relevant sounds.
- In the S3 training form the client is instructed to respond to specific stimulus combinations (figures that make particular noises).



Difficulty structure

There are 15 difficulty levels for each training form. SELECT adapts to the client's ability level in two ways. Firstly, the number of relevant or irrelevant stimuli increases or decreases. Secondly, at each difficulty level

the maximum permitted reaction time adapts to the speed of the client's reactions. Thus for a skilled client the wagon gets

faster after the first few responses. This ensures that from the outset the training program is optimally adapted to the client's skill and is never either too easy or too difficult for him.

Worth knowing

SELECT can also be used with patients with impaired field of vision.

Corresponding test in the

VIENNA TEST SYSTEM

WAFS

FOCUS Attention: Focused

Walter Sturm © SCHUHFRIED GmbH



Theory

Focused attention describes the ability to isolate a segment of reality in order to be able to analyse it more closely. It is particularly important to be able to maintain this focus in the face of distractions and to suppress the interference caused by the simultaneous and automatic processing of information.

Setting and task

A boat travels through a lush African landscape. The client is confronted with a wide range of different stimuli: screeching birds, flying dragonflies, a ruin on the banks of a river, a waterfall etc. His task is to respond to pre-defined relevant stimuli without letting himself be distracted by the large number of other stimuli.

The FOCUS training program trains focused attention – the ability to respond only to relevant stimuli among a high density of distracting stimuli.

Training forms

The FOCUS training program consists of two training forms, each of which has ten difficulty levels:

- › The S1 training form requires the client to recognise visual stimuli against a background of distracting stimuli which may be acoustic, visual, or a combination of the two.
- › In the S2 training form the task is to detect acoustic stimuli in the face of other stimuli which may likewise be acoustic, visual, or a combination of both.

Difficulty structure

The difficulty structure of the FOCUS training program is designed to adapt as far as possible to the amount that the client can take in. Thus a client of weak ability will be presented with a low-stimulus environment, while a client of strong ability will be confronted with a large number of distractor stimuli. The number of distractor stimuli presented is carefully graded and the time allowed for identification of a stimulus is adapted to the client's skill.

Corresponding test in the

VIENNA TEST SYSTEM

WAFF

Attention: Divided **DIVID**

Walter Sturm © SCHUHFRIED GmbH

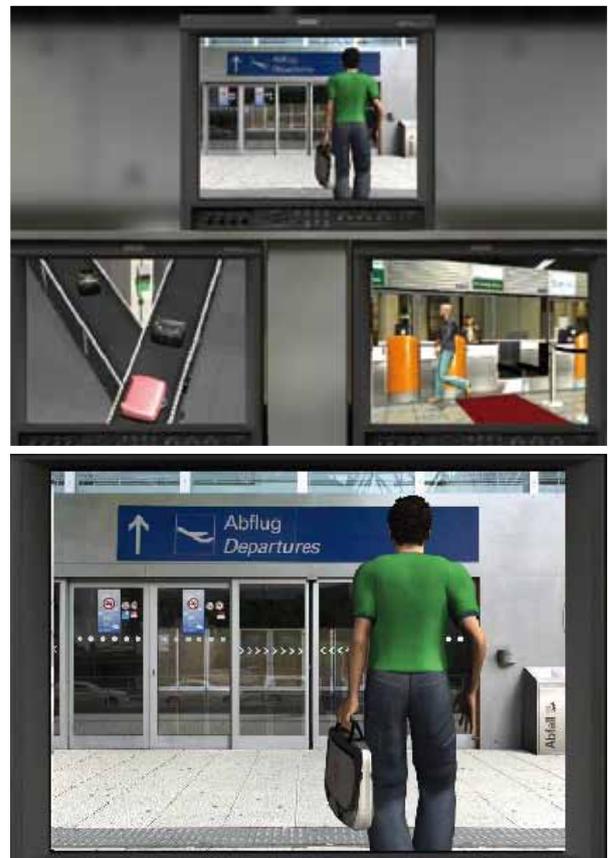
The DIVID training program trains divided attention – the ability to perform different tasks simultaneously.

Theory

The ability to divide one's attention depends on the processing resources available and on the nature of the combined tasks. The more similar the tasks, the greater the interference that arises between them (Wickens, 1984). In everyday life the ability to split one's attention is relevant to many skills – for example, driving a car, which normally requires the simultaneous monitoring of a number of different information streams.

Setting and task

In this training program the client takes on the role of a security official at an airport. He has to simultaneously observe both a range of scenes on several control monitors (sliding doors at the entrance, ticket counter, luggage conveyor) and announcements made over the loudspeaker system. His task is to deal with problems that occur by pressing the response key. If the client fails to react promptly to a problem or a relevant announcement, the picture is frozen on all channels and the channel on which the problem occurred is highlighted. The events displayed do not continue until the reaction button is pressed.

**Difficulty structure**

DIVID has 15 difficulty levels. The difficulty levels vary in terms of the number of channels that the client has to monitor, the frequency of breakdowns, the minimum interval between two breakdowns and the maximum time allowed for noticing a breakdown.

Corresponding test in the

VIENNA TEST SYSTEM**WAFG**

SPACE Neglect/visual field training: Visuo-spatial attention

Walter Sturm © SCHUHFRIED GmbH



Theory

In everyday life our attention may be focused on a different source from our perceptive organs. Peripheral stimuli lying outside our central field of vision can attract the focus of attention to themselves. They then bring about a change in the direction of gaze or a turning of the head towards an object or event (visuospatial attention). Peripheral cues tend to bring about an automatic (exogenous) spatial shift of attention, while central cues (e.g. an arrow in the fixation point pointing to the left or right) are more likely to produce a cognitively controlled (endogenous) shift of attention, since a particular expectation is generated. Both peripheral and central cues cause a covert shift of attention to the right or left and thus make it easier to detect stimuli in the half of the visual field in which the cues occur or to which they point (valid condition). However, if the cue is in the wrong half or points in the wrong direction (invalid condition), the speed of reaction to the target stimulus is slowed, since attention must first be shifted from the “wrong” focus to the correct spatial position.

Setting and task

The client assumes the role of a photographer. His task is to observe various scenes such as a market place, airport, office, children’s playground etc. The camera viewfinder moves towards a particular point in the area under

The SPACE training program was created for patients with hemineglect but it can also be used successfully with patients who have an impairment of the visual field. It improves the visuospatial directing of attention and is intended to train the specific ability to direct attention to stimuli on the contralesional side of the field of vision.

observation. The task is to take a “photo” by pressing the reaction key as soon the viewfinder stops and has “captured” an object. In each scene there is a fixation point in the center towards which the client should direct the position of his head and the direction of his gaze and where he can find the viewfinder if he has lost sight of it.

Difficulty structure

There are ten different difficulty levels, each of which displays a different scene of interest on the screen. The level of difficulty is increased by varying the way in which the viewfinder moves (continuous movement, jumping movement, with and without a return to the center) and the complexity of the scene. In addition, at the lower levels of difficulty the task is made easier by an acoustic and visual cue (sound and arrow in the middle of the viewfinder) which indicates the direction of the next movement. At the higher levels of difficulty only irregular cues are given, and the cues may give no indication of direction or even be completely wrong – for example, the arrow in the viewfinder may point to the upper right while the viewfinder jumps to the lower left.

Worth knowing

We recommend the use of monitors with a screen diagonal of at least 19” so that the area of the visual field being trained is as large as possible.

Note

The instructions for the SPACE training program are displayed on only one side of the screen and are therefore easily read by patients with neglect or visual field impairment.

Corresponding test in the

VIENNA TEST SYSTEM

WAFR

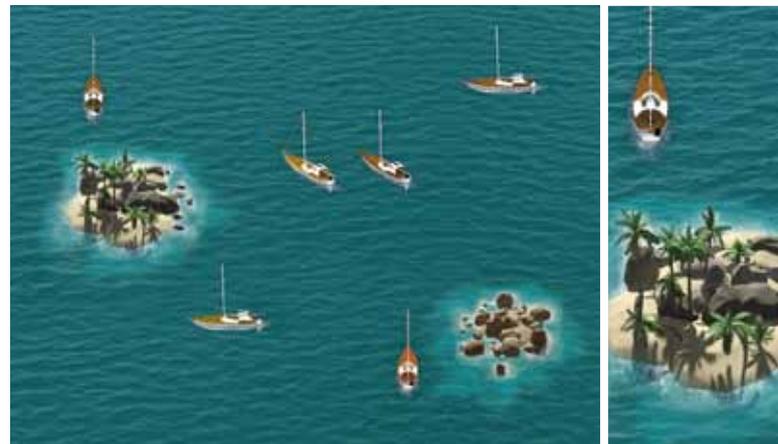
Dieter Schellig, Uwe Schuri, Walter Sturm © SCHUHFRIED GmbH

The VISP training program trains visuospatial working memory – spatial rehearsal, coding of moving stimuli and interference control.

Theory

The training of visuospatial working memory (VISP) has a special place within the working memory programs of CogniPlus: using a standardised task design, it provides an introduction to various aspects of visuospatial working memory and develops a strategy of active rehearsal, thus serving in part as preparation for other types of training.

Visuospatial working memory comprises several storage components: sequential-spatial and simultaneous-spatial working memory and the saving of static and dynamic information and of spatial characteristics and object properties. These storage functions are trained in the program using different types of task.



Setting and task

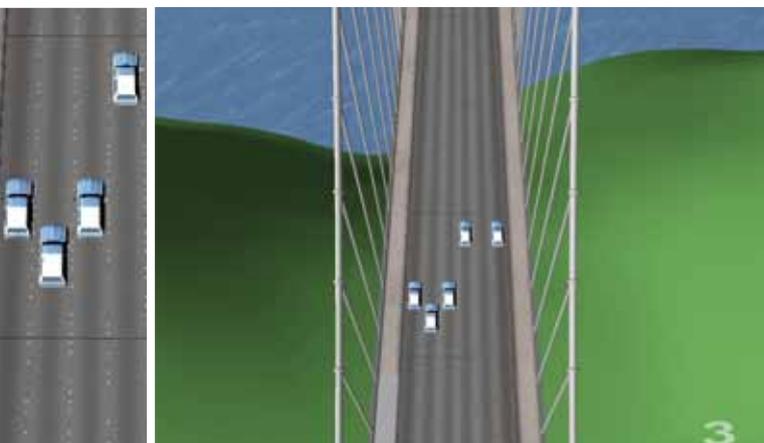
In VISP the client has a bird's-eye view of a number of ships on the ocean. Some of the ships are indicated in turn (e.g. they are illuminated or disappear). After a delay phase the client must reproduce the sequence in which the ships were indicated.

Difficulty structure

The difficulty of the three subprograms of VISP (rehearsal, coding of moving stimuli, interference control) is varied in several ways. At the lower difficulty levels the client must select the ships that were illuminated in the encoding phase, but not necessarily in the sequence in which they were illuminated. The task is also made easier through the allocation of ships to islands (landmarks) that are of very distinctive appearance and therefore easy to remember. At the higher difficulty levels the ships disappear after the encoding phase and the client must click with the mouse to indicate where the selected ships were located.

Corresponding test in the

VIENNA TEST SYSTEM
CORSI



The CODING training program provides practice in the coding of space and time and in monitoring, with an emphasis on visuospatial working memory.

Theory

Both monitoring and coding of space and time are executive base mechanisms of working memory. They are used for (metacognitive) control and coordination of cognitive processes and form the basis for more complex cognitive processing. For example: the availability of detailed information via a serial array of stimuli in working memory is a requirement for many planning and processing tasks at higher cognitive level – e.g. the syntax of a sentence or the scheduling of a complex goal. The executive functions of working memory that are trained in the CODING program have different neural correlates – which in itself calls for differentiated training of these various processes.

Setting

The client observes vehicles driving onto a bridge. While driving over the bridge the vehicles disappear from the client's view. When they reappear at the end of the bridge, some vehicles may have changed their spatial or temporal position. These vehicles must be identified.

Training forms

The CODING training program has two training forms: The S1 training form trains temporal coding, while the S2 form trains spatial coding. In the S1 training form the vehicles travel onto the bridge one after the other in the same lane. The client's task is to remember the sequence of the serially presented stimuli. In the S2 training form the vehicles travel next to each other in several lanes. In this form the client needs to remember the spatial arrangement of the vehicles.

Difficulty structure

Different memory and recall strategies are required at the different difficulty levels; the tasks involve range from the identification of errors to complete reconstruction of the original sequence and the correction of errors. At the same time, ever greater control of interference is called for.

The lower difficulty levels in both training forms train the client's monitoring skills through the identification of errors. The client must decide whether or not the temporal or spatial arrangement of the vehicles shows changes/errors (yes/no answers).

In the S1 training form the difficulty then increases by requiring the client to reproduce the sequence of the vehicles by clicking on the stimuli in the correct order. The highest difficulty levels call for the correction of errors in the coding of time: the client must click on the two vehicles that have changed their serial (temporal) position.

In the S2 training form the client must click on the vehicle that has changed its position within the spatial arrangement. The difficulty of the spatial encoding training is increased at the highest level by the disappearance at the recall stage of the physical structures between the vehicles; the scene must be reconstructed from memory. At this level the client must dissolve his binding of the entire temporal or spatial structure.

Corresponding test in the

VIENNA TEST SYSTEM

CORSI

Working memory: Updating – visual **NBACK**

Markus Sommer, Rudolf Debelak, Christine Heidinger © SCHUHFRIED GmbH

The NBACK training program trains the monitoring function of working memory – the ability to retain information and continuously update it.

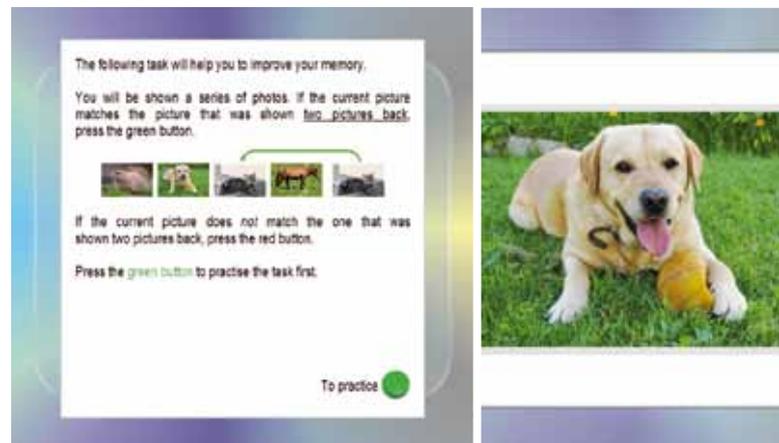
Theory

Working memory is of key importance in dealing with the demands of everyday life, especially when information that has been briefly presented must be retained and cognitively processed, or when a task needs to be performed or a goal achieved. Many diseases such as Alzheimer's disease, Huntington's chorea, Parkinson's disease or attention deficit hyperactivity disorder are associated with impairments of working memory and consequent difficulties in coping with everyday tasks.

Recent scientific findings indicate that the capacity of working memory can be improved through regular training. As the work of various researchers has shown, the effect of such training is enhanced if the training tasks adapt to the client's ability level. This is the case in NBACK. The training material consists of n-back tasks which require the client to react to stimuli that recur at a particular interval. These tasks place demands on the client's ability to retain task-related information and continuously update it in his mind.

Setting and task

In the NBACK training program the client sees a representation of a digital picture frame on his screen. A succession of photographs appears in the frame; the photos have different subject matter (animals, landscapes, colors etc.). The client's task is to decide whether the current photograph matches the one that was shown



one, two or three places back (the number of places varies with the level). If it matches, he should press the green button. If it does not match, the red button must be pressed.

The client receives feedback on his performance at regular intervals (approx. every 5 minutes). The aim of this feedback is to maintain the client's motivation at an optimal level.

Difficulty structure

NBACK has 15 difficulty levels and adapts to the client's ability in four ways.

1. The difficulty is varied by changing the number of stimuli that the client must remember. At the lower levels the current stimulus needs only to be compared with the immediately preceding one. At the highest levels the current stimulus must be compared with the one that was displayed three places back.
2. The semantic similarity of the pictures represents an additional difficulty parameter. At higher levels the pictures become more similar.
3. The picture content becomes more abstract and hence more difficult to verbalise.
4. The picture presentation time becomes shorter as the difficulty increases.

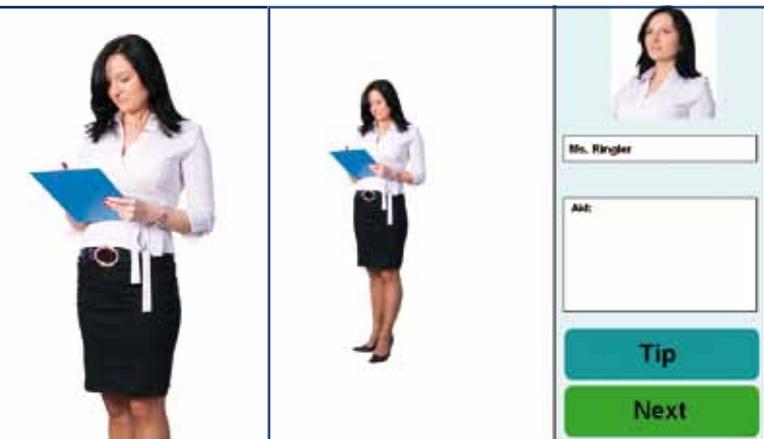
Corresponding test in the

VIENNA TEST SYSTEM

NBN

NEW **NAMES** Long-term memory: Learning of face-name associations

Uwe Schuri, Dieter Schellig, Walter Sturm © SCHUHFRIED GmbH



The NAMES training program enables the client to practise effective strategies for learning people's names and associating them with faces. In addition the program enables knowledge to be built up (names that are relevant to the client).

Theory

According to current psychological models of cognition, people's names have fewer structural connections than other identity-specific semantic details (such as occupation or nationality) and names of objects. Because of their limited networking, the learning and later recall of people's names is a particularly demanding cognitive task. However, performance in learning face/name pairs can be improved by applying particular processing strategies – such as conscious linking with information already in memory, use of mental imagery and repeated recall of names after increasingly long periods of time (spaced retrieval). In addition, patients with severe memory impairments benefit from avoiding mistakes in learning (errorless learning).

Setting and task

In NAMES the client is instructed to remember the names of individuals. He is helped by learning loops that encourage the identification and use of specific strategies and aim to develop effective associations between names and faces. In the S1 training form the client is required in the course of training not only to learn names one at a time but also to memorise the names of several people at the same time. At the most advanced difficulty levels the individuals are introduced by a speaker, as at a party. This is intended to simulate a real-life situation in which names must be remembered in a short period of time and thus facilitate transfer to everyday life.

Training forms

The NAMES training program uses three training forms:

1. The S1 training form trains strategies for learning and remembering names. This training form uses names and photos from the program's own database. It can be used by clients on a self-directed basis.
2. The S2 training form also trains strategies for learning and remembering names, but it uses names entered by the client and therapist themselves. A list of names relevant to the client must therefore be compiled before training starts.
3. The S3 training form is useful for clients with major deficits of long-term memory who want to remember people who are important to them (e.g. family members, clinic staff, people in the news etc.). The client is not required to learn strategies, as he is in forms S1 and S2, but simply to memorise names that are relevant to him. This training form can only be controlled by the therapist.

Difficulty structure

In the S1 training form difficulty is altered by varying the meaningfulness of the names, the distinctiveness of the pictures, the number of people in a set to be learned and the time allowed for the encoding. In the S2 and S3 training forms, where the aim is to memorise names relevant to the client, there is no variation in difficulty.

Corresponding test in the



Executive functions: Response inhibition **HIBIT****NEW**

Matthias Weisbrod, Stefan Kaiser, Ute Pfüller, Daniela Roesch-Ely, Steffen Aschenbrenner © SCHUHFRIED GmbH

The HIBIT training program trains response inhibition – the ability to suppress unwanted reactions.

Theory

In everyday life the ability to suppress unwanted reactions is an important component of the ability to act flexibly and appropriately. If environmental conditions change, practised reaction patterns are often dysfunctional and must be suppressed, so that new behaviour appropriate to the situation is possible. Deficits of response inhibition are reported

- in diseases characterised by impairment of impulse control (e.g. ADHD, borderline personality disorder, dependency disorders)
- in diseases characterised by rigid and inflexible behaviour (schizophrenia, compulsive disorders)
- in various neurological diseases (Parkinson's disease, dementia of the Alzheimer's type).



Setting and task

In the HIBIT training program the client assumes the role of a post-office employee who must sort letters and packages as quickly and accurately as possible by pressing a button. He must look out for specific features (e.g. the presence of a stamp) that indicate when he must react and when he must not react. Four different scenarios (Go-Nogo, Stop-Signal Task, Cued Go-Nogo, Behavioral Shift) make different demands on the client's ability to suppress a reaction.

Difficulty structure

The difficulty levels of HIBIT vary systematically in the demands they make on response inhibition. The inhibition of responses is made more difficult across the difficulty levels by a reduction in the number of no-go stimuli, shorter presentation time of the letters and packages and an increasing number of discriminators (several stamps, additional inscriptions on a package).

Corresponding test in the

VIENNA TEST SYSTEM**INHIB**

NEW **PLAND** Executive functions: Planning and action skills

Daniel V. Holt, Joachim Funke © SCHUHFRIED GmbH



In the PLAND training program action and planning skills are trained through the presentation of realistic planning tasks.

Theory

Meaningful and independent action in everyday life becomes possible only when behaviour is planned and organised over a relatively long period and competition between tasks is dealt with by setting priorities. Planning ability can be impaired by brain damage of any etiology and origin, especially where there is damage to frontal structures or diffuse cerebral damage. Executive functions can also be affected by a range of psychiatric illnesses, including schizophrenia and depression. PLAND is a training system based on everyday activities which enables clients to practise creating and implementing schedules of varying complexity. It gives the therapist the opportunity to work interactively with the patient to devise various strategies for improving cognitive functions and self-control. The aim is to improve planning and action skills in everyday situations.

Setting and task

In the PLAND (Plan a Day) training program, the client is given the task of deciding on the best order in which to carry out the day's activities. The starting point is a list of things that need to be done and a virtual street

plan on which various buildings and the client's current position are marked. In accordance with the planning task the client must devise a strategy for deciding the order in which the different components of the task will be tackled and hence the order in which the buildings will be visited.

Training forms

The PLAND training program consists of three training forms (S1, S2 and S3) in which the task varies in accordance with three types of requirement: observing priorities, minimising journey time and maximising the number of tasks completed.

Difficulty structure

The S1 training form has 19 difficulty levels, the S2 form has 16 and the S3 form 28. In all training forms the number of things that need to be done increases as the difficulty level rises.

Depending on the training form, other difficulty parameters may be added as the difficulty level increases (e.g. increase in overlapping appointments).

Corresponding test in the

VIENNA TEST SYSTEM

Plan Test | in implementation |

The ROTATE training program trains the ability to form an accurate mental image of a three-dimensional object from a two-dimensional representation of it, and to rotate this image mentally.

Theory

Current theoretical models of this ability area assume that the processing of mental rotation tasks involves four stages, which are to some extent inter-related (see Just & Carpenter, 1985, Arendasy & Sommer, 2010):

- Search stage (the search for corresponding object parts)
- Encoding stage (building up a mental image of the object)
- Transforming (transforming the mental image through rotation)
- Confirmation stage (comparison of actual results with desired outcome)

This complex process can be achieved through practice, such as that provided by ROTATE (for a summary: Hand, Uttal, Marulis and Newcombe 2007).

Setting and task

2D images of various 3D objects (concrete and abstract) are shown on the screen; the client must compare them with reference pictures.

Difficulty structure

The following task characteristics are systematically varied across the various difficulty levels:

- Angle of rotation
- Direction of rotation
- Complexity of the figures
- Spatial complexity of the figures

In addition different task types are used to improve the transfer of the learned cognitive functions.

Corresponding test in the

VIENNA TEST SYSTEM

A3DW



The VISMO training program trains visuomotor coordination - the ability to coordinate hand and arm movements in response to visual stimuli.

Theory

Visuomotor coordination skills play an important part in many everyday situations such as driving a car, using household equipment or picking up objects.

Coordinating motor movements with visual stimuli requires a number of different abilities. First, it is necessary to identify what movements are necessary to achieve a particular goal. This involves creating internal models of the movement. After this the relevant movement must be planned and prepared, and finally the movement is executed. While the movement is being performed, the individual must use visual feedback to monitor whether the desired goal is being achieved. If necessary the movement must be changed, or a new movement may need to be initiated. At the same time, all external influences on the movement – such as gravity – must be taken into account.

Worth Knowing

Requires the Universal response panel.

→ [read more on page 24](#)

VISMO trains clients' visuomotor coordination by means of tracking tasks. These involve using a joystick to keep a circle positioned over a target object on the screen. The

target object moves across the screen along a path that varies in its degree of complexity. A number of studies have shown that regular training with tasks of this type improves visuomotor performance in patients with motor disabilities. There is also evidence that these tasks can improve visuomotor ability even in people without motor disabilities.

Setting and task

In the VISMO training program the client is instructed to observe the sky through a telescope. His task is to keep a particular object – a satellite, planet or spaceship – within the telescope's finder (a green circle on the screen). Since the object is moving across the sky as it is being watched, the client must actively track it with the finder. The aim is not to lose the object from the finder. The longer the finder remains on the object, the more points the client accumulates.

Difficulty structure

The VISMO training program has 22 difficulty levels. Training adapts to the client's performance level in four ways. As the difficulty level increases the path along which the target object travels becomes invisible and increasingly difficult to follow, the speed of the target object increases and the number of distracting objects in the scene also increases.

Corresponding tests in the

VIENNA TEST SYSTEM

MLS / 2HAND

The Vienna Test System and CogniPlus: They go together!

1 | TEST

2 | TRAIN

VIENNA TEST SYSTEM
Psychological assessment

COGNIPLUS
Cognitive training

3 | TEST THE SUCCESS
OF TRAINING

Attention	Alertness	WAFA	ALERT
	Vigilance	WAFV	VIG
	Selective	WAFS	SELECT
	Focused	WAFF	FOCUS
	Divided	WAFG	DIVID
Neglect / visual field training	Visuo-spatial attention	WAFR	SPACE
Working memory	Visuo-spatial	CORSI	VISP
	Spatial and temporal encoding	CORSI	CODING
	Updating – visual	NBN	NBACK
Long-term memory	Learning of face-name associations	GNL*	NAMES
Executive functions	Response inhibition	INHIB	HIBIT
	Planning and action skills	PLAN TEST*	PLAND
Spatial processing	Mental rotation	A3DW	ROTATE
Visuomotor skills	Visuomotor coordination	MLS 2HAND	VISMO

The tests of the Vienna Test System and the training procedures of CogniPlus are coordinated. The training programs are based on the same theoretical models as the tests to which they correspond; this provides an efficient and theoretically sound link between assessment/training and the subsequent analysis of effectiveness.

The corresponding tests and training programs are based on the same theoretically clearly defined constructs but involve different tasks. This enables a reliable distinction to be made between the material-specific learning effect and the material-independent training effect which is being aimed at.

The summary shows which CogniPlus training programs are specifically tailored to the deficits tested by the Vienna Test System.

* | in implementation |

Training at the computer

USER-FRIENDLY SOFTWARE

The CogniPlus menu is clear, user-friendly and simple and intuitive to use. You don't need to be Bill Gates to find your way around. That's a promise!

INPUT DEVICES

The CogniPlus training programs can be worked with a normal computer keyboard or with the SCHUH-FRIED response panel, which is available in two versions. The response panel is particularly suitable for individuals with restricted hand movement. We shall be happy to advise you!



Standard response panel:

- › 7 colour keys
- › 10 number keys
- › 1 sensor key
- › Connection for foot-operated keys
- › USB connection



Universal response panel:

- › 2 analogue joysticks
- › 2 twist knobs
- › 7 colour keys
- › 10 number keys
- › 1 sensor key
- › Connection for foot-operated keys
- › USB connection

Worth knowing

The Standard and Universal response panels can also be used as input devices for the Vienna Test System.

MORE TIME THROUGH INDEPENDENT TRAINING

You have more time when you use CogniPlus. Your clients can train on their own (except for children or individuals needing a high level of care).

A typical training session

1. Set up the training program

Starting CogniPlus takes you directly to the convenient and detailed menu. As soon as you have registered a client, CogniPlus opens a client file with the four index cards, "Client data", "Training", "Results" and "Logbook".

On the **"Client data"** index card you can enter the client's details.

The **"Training"** index card lists all the available training programs. You can select the desired program and specify its duration. A session can consist of several training programs presented one after the other, in the order specified by you in the training sequence list.

The **"Results"** and **"Logbook"** index cards provide training results and session data. In the "Logbook" the system automatically records the details of each session. You can also add comments here. You thus have a compact but complete digital client file.

If your client is able to work alone, after selecting the training programs you can specify whether he is to move on directly from one program to the next, thus working his way independently through the session, or whether you will start the next program for him.

This means that your presence during the session is not essential, unless the client needs special care (e.g. children or severely disabled patients).

Worth knowing

Save even more time with the Direct Training function!

→ [page 27](#)

2. Instruction phase

Each training program starts with an instruction phase. Simply formulated instructions inform the client of what he has to do. He can spend as much time reading them as he wishes; this prevents stress.

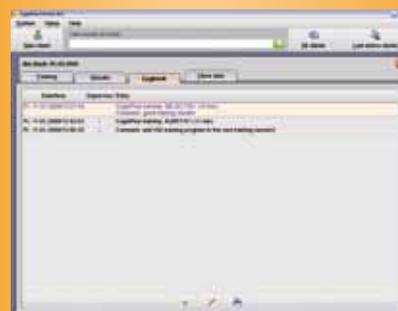
To make things easier for the client, all CogniPlus programs are designed along the same lines. In addition, they make use of everyday knowledge; for example, based on traffic-light usage the start button is always green. Guided by the careful use of size and color on the screen, the client absorbs information selectively in accordance with the importance of the various elements.

Worth knowing

Because they can be presented on one side of the screen only, the CogniPlus training programs ALERT, VIG and SELECT are also suitable for patients with hemineglect or hemianopsia. The text then appears on either the left or the right half of the screen, depending on the region of the neglect.



Index card 'training'



Index card 'logbook'



Instruction phase

A typical training session

3. Practice phase

The instruction phase is always followed by a practice phase. If the client's responses indicate that he has not yet understood the task, the system will automatically repeat the instructions. The training phase does not start until the client has successfully completed the practice phase.



Practice phase

4. Training phase

You can use the CogniPlus programs to carry out training at any level of difficulty across the ability range. If a new client commences training, CogniPlus quickly and automatically identifies his ability level and classifies him accordingly. If the client has already completed one or more training sessions, the new session begins where the last one finished.



Training phase

So that clients are neither under- nor over-challenged, all the training programs have been designed to be adaptive; that is, they adapt themselves continuously to the client's ability level.

5. Evaluation of results

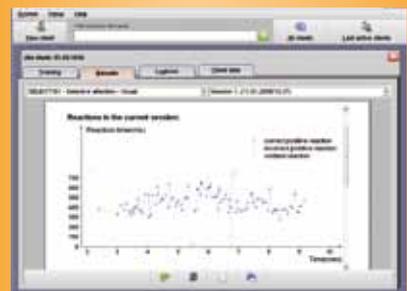
CogniPlus provides two types of evaluation of results:

1.) **For the client:** Each training session concludes with an easily read chart of performance in recent sessions



Client evaluation

2.) **For the test supervisor:** At the end of the session detailed results of the individual programs used during that session are available. These results include mean reaction times and the number of correct, delayed, incorrect and omitted responses at each level of difficulty. In addition a chart records each response made during the session in terms of difficulty level, reaction time and scoring (correct, delayed, etc.). It is also possible to compare performance in the most recent session with that in the preceding sessions.



Supervisor evaluation

Direct training **NEW**

Direct training

The new Direct Training function enables training to be administered fully automatically without a supervisor. It is used mainly in CogniPlus networks that have access to a central database. However, Direct Training can also be used on local CogniPlus systems.

This is how it works: You first assign each client a personal ID and set up a training session. You start Direct Training by selecting "Direct Training" in the "System" menu. Alternatively, Direct Training can be started from an icon on the desktop or from the Start menu.

Via his own screen the client will now be instructed to enter his personal ID and then to confirm that his personal details are accurate. He then accesses the training session and training proceeds in the same way as training started manually by the supervisor.

Worth knowing _____

You can also use a barcode reader to input the client ID.



Best practice CogniPlus in use



Kolpinghaus "Gemeinsam Leben" (Vienna)

Application: Geriatrics

Thomas Pletschko

Clinical and health psychologist, sociologist, Kolpinghaus für betreutes Wohnen GmbH

"In the housing complex run by Kolpinghaus für betreutes Wohnen GmbH in Vienna different generations live side by side; the majority of residents are older people in need of care. CogniPlus has been used since autumn 2006. The aim of cognitive training with CogniPlus is to train functions affected by dementia-related deterioration and to stimulate mental activity in individuals affected by symptoms of depression in old age.

Before training commences a detailed assessment is carried out using appropriate psychological assessment tests, such as the WAF tests from the Vienna Test System. The training sessions themselves are conducted once a week and last for approximately 45 minutes. After twelve training sessions the progress made is evaluated, once again by using psychological assessment tests.

The value of CogniPlus in our residential home can be seen in two areas. Firstly, it is very useful for the type of dementia-related deterioration for which cognitive training has been shown to be effective – that is, in cases of mild cognitive impairment (which is often a precursor of dementia) and mild dementia. Secondly, it also has a positive effect in individuals with depressive symptoms, with the result that these residents then report more mental activity in their everyday lives."

Treatment and Rehabilitation Center for Neurology and Orthopaedics (Bad Pirawarth)

Application: Neuropsychological rehabilitation

Kerstin Heger

Clinical and health psychologist

"The psychology department at the neurological Treatment and Rehabilitation Center at Bad Pirawarth has been using the neuropsychological training software CogniPlus for more than three years. For patients with impairments of cognitive functions as a result of stroke, craniocerebral trauma, tumour surgery, Parkinson's disease, MS, incipient or early-stage dementia and other neurological diseases, CogniPlus provides some effective training modules for improving the functioning of attentional performance. This enables treatment to be targeted at the patient's specific limitation.

At the Pirawarth clinic we have successfully used the programs DIVID (divided attention), SELECT (selective attention) and ALERT (alertness).

SELECT includes not only visual and acoustic variants but also a crossmodal version which makes comparatively challenging demands on patients' abilities.

DIVID is particularly appealing in its design (airport operations), and the various tasks are presented very comprehensibly and realistically.

ALERT is designed in a varied and interesting way and has a reality link to the attention function (the ride on a motorcycle to train alertness); many patients find it entertaining and motivating. The connection between reaction speed and traffic situation is logical.

The instructions in all three program modules are easily understood without additional explanations and the programs adapt well to the user's ability. The Response Panel is very user-friendly and also suitable for patients with motor disabilities. The theory-led development of the training software, which has been specifically designed to improve particular facets of attention, and the (electronically) included and scientifically sound manuals contribute to the very satisfactory use of the system in our everyday work.

Given regular training (three to five units/week), significant improvements in attention are observed in some patients."



Children & Young People's Psychiatric Service (Baselland)

Application: Children with ADS

Angelika Berger

Dipl. Psych., neuropsychologist FSP/GNP, senior psychologist

"Since 2003 the Baselland Children & Young People's Psychiatric Service in Switzerland has been running therapy groups for children with ADS in the age range 9 – 12, focusing on attention. A core tool of this group therapy is computerised attention training – originally using the AIXTENT program and now with the new version CogniPlus.

The group therapy, which is conducted by a team of psychologists, is intensive; it consists of 20 sessions with the children and accompanying parents' evenings. In the therapy sessions each child uses the computer to work on two areas of attention.

The children very much enjoy working with CogniPlus. The tasks are designed to arouse their interest and the graphics are appealing. The use of the program is also easy for the children to master. Clinical catamnesis indicates very satisfactory improvement for a large proportion of the children as revealed both in the re-testing of attentional performance and in the assessments of parents and teachers."

Neuro-oncology unit of the University Clinic for Children's and Young People's Medicine (Vienna)

Application: children and young people

Thomas Pletschko

Clinical and health psychologist, sociologist, University Clinic for Children's and Young People's Medicine, AKH Vienna

Dr. Ulrike Leiss

Clinical and health psychologist, University Clinic for Children's and Young People's Medicine, AKH Vienna

"CogniPlus has been in successful use for more than a year in the neuro-oncology unit at the University Clinic for Children's and Young People's Medicine.

The program has been found to represent a suitable treatment option for a variety of indications. On the one hand we use it for training neuropsychological functions (where there are function deficits); on the other it also proves very beneficial for children and young people with a poor experience of self-efficacy or low frustration tolerance.

For the children themselves the programs are attractively designed and when used appropriately there is very little need for additional motivating intervention. Even the Divided Attention (DIVID) program, the graphics of which have been designed with adults in mind, is well received by children – not least because it is set in an airport – and rouses their interest.

By combining CogniPlus training with supporting measures designed to ensure the transfer of training effects to everyday life, optimum treatment success can be achieved, as many case studies show."

Other things worth knowing

LANGUAGES

To enable clients to train in their own language, CogniPlus is currently available in 14 languages.

The CogniPlus training programs are continually being translated into additional languages. Visit www.schuhfried.com for up-to-date information.

- | | |
|-----------|-------------|
| › Arabic | › Hungarian |
| › Chinese | › Italian |
| › Czech | › Polish |
| › Dutch | › Russian |
| › English | › Slovak |
| › French | › Spanish |
| › German | › Turkish |

SYSTEM REQUIREMENTS

As at: July 2010

Computer

- › PC with pentium or compatible CPU, min. 2.5 GHz
- › at least 512 MB RAM
- › DirectX 9.0 compatible 3D graphics card with at least 128 MB RAM and a Nvidia (GeForce FX5200 or better) or ATI (Radeon 9500 or better) graphics chip. The display driver must support Open-GL version 1.4 or higher.
- › USB headset or USB speakers. Please ask your dealer or SCHUHFRIED GmbH about suitable devices.
- › DVD drive, hard drive, mouse, keyboard
- › USB ports for the license dongle and any additional hardware (if all the computer's USB ports are in use, a USB hub with external power supply will be required).
- › serial port (if a Test System Interface is used)
- › network card for connecting the computer to a network (e.g. for setting up a test system network)
- › operating system: Windows 2000/XP/Vista/7 (x32 or x64)

It is important that no programs are installed on the computer that could interfere with the presentation of training (e.g. through high CPU usage or unwanted output on the screen).

Monitor

- › CRT or TFT colour monitor with at least 15" visible screen diagonal (19" for the SPACE training program).
- › For CRT monitors the refresh rate must be at least 75 Hz.
- › It is recommended that only synchronous TFT monitors are used; asynchronous screens may flicker in a way that interferes with training. The test program PixPerAn can be used to check whether a screen is synchronous or asynchronous.

Safety devices

If CogniPlus is used within the healthcare service, use of the following devices is required:

- › medical grade isolation transformer in accordance with EN 6061
- › galvanic medical network isolator in accordance with EN 60601 (if the computer is connected to a data network)

Please ask your in-house health and safety officer.

Printer (optional)

Laser or inkjet printer, black and white or color

Worth knowing

Products of SCHUHFRIED GmbH are developed and produced in accordance with EU Directive 93/42/EEG. The CE mark confirms that our products comply with technical safety regulations, electro-magnetic compatibility guidelines (EN60601), biocompatibility guidelines (EN30993) product-specific requirements and quality management standards.

Other quality products from SCHUHFRIED

VIENNA TEST SYSTEM

Psychological assessment

The Vienna Test System (VTS) is known world-wide as the leading computerised psychological assessment tool. The system consists of powerful administration software, the tests themselves and additional optional input devices.

You can choose from more than 120 tests:

- › intelligence tests
- › ability tests
- › personality tests
- › attitude tests
- › clinical tests

These tests include not only computerised versions of familiar paper-and-pencil tests but also auditory, multi-media and adaptive tests. They can be combined as required in order to provide the best set of tests for your particular purpose. We shall be happy to advise you!



Order now free of charge!
Catalog VIENNA TEST SYSTEM

› [E-mail info@schuhfried.at](mailto:info@schuhfried.at)

BIOFEEDBACK 2000^{x-pert}

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