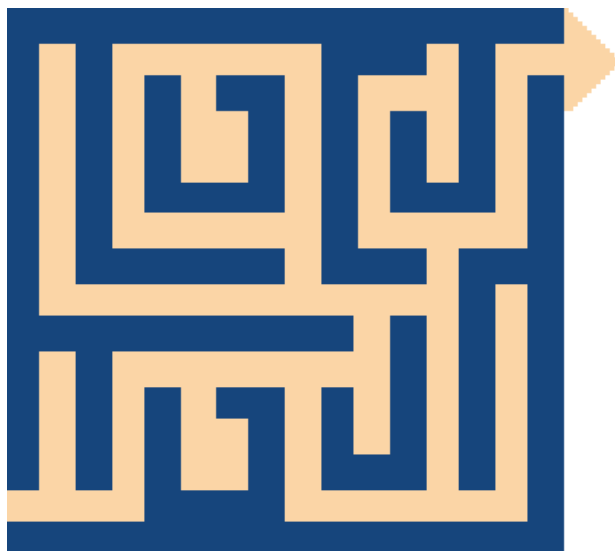# LocuTour® MULTIMEDIA
COGNITIVE REHABILITATION

Attention and Memory: Volume II

Developing Functional Memory and Attention Skills

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Attention and Memory: Vol. II
Developing Functional Memory and Attention Skills

The intention of *Attention and Memory: Volume II: Developing Functional Memory and Attention Skills* is to provide both auditory and visual exercises to improve functional skills. This computer-assisted treatment program provides you with the data collection tools to identify, monitor and explicitly evaluate outcomes related to specific functional skills. The first three games could be classified as "decontextualized" activities in that they are specific skill driven. The subsequent three games apply these skills to functional attention and memory tasks. Having both types of activities woven into an overall treatment plan allows for specific instruction on areas of weakness and immediate practice with generalization tasks encountered in everyday life.

We have experience with individuals who have significantly improved their linguistic skills, yet struggle with memory. Lengthening the amount of time that a head injured person can hold on to information eventually leads to more relevant conversations, greater independence and improved quality of life. **Progress through the computer-assisted protocol provides systematic intervention that addresses: executive functions, memory strategies, verbal mediation, visual-perceptual discrimination, reading comprehension and functional application of memory strategies to daily activities.** *Teaching working-memory strategies may thus provide a more efficient treatment approach than working piecemeal on several language goals* (Montgomery, 2002).

As clinicians we have experience with clients who perseverate because they are unable to remember whether they have previously asked a question. We know that paying attention in the first place is the key to getting information into the memory stores. We also know that head injured individuals are slower at shifting attention during conversation and have difficulty with divided attention and auditory distraction. It has been demonstrated that working memory plays a crucial role in inhibiting distractions and controlling selective attention (Fockert et al., 2001). Baddeley's model of working memory postulates that damage to the central executive, that coordinates a group of temporary storage systems, would most likely significantly limit a person's ability to process information and cope with everyday life (Baddeley, 1984).

The programs on this CD progress from simple sustained attention tasks to alternating and divided attention tasks with options for response delays and auditory distractors. The first four programs: *Change, Zydeco, 7 ± 2,* and *Scanning* were designed for skill building. The last three: *And one more thing…, Functional Memory,* and *Dominoes* were designed to apply the skills in a linguistic or functional task. The *Über tasks* are designed to measure ability to return to the target task after a distraction. Some of these tasks access proscriptive memory, which is the ability to say to yourself, "In five minutes I need to..." Other *Über tasks* access retrospective memory. "You told me to remember these three words." The remainder of the tasks are interfering tasks designed to work on divided attention skills. They focus on working memory

as in, "I have to answer the question in front of me and then return to the task I was doing before I was asked the question." Some of the *Über tasks* are introduced at the beginning of the treatment progression, but many more tasks are available and can be individualized for personal information and application to the client's world and specific memory needs.

How to Begin

There are two primary ways to play *A&M II*. The first is to allow the computer to automatically move you through the levels beginning with the first game, *Change*. When your prescribed time is up for a given game, you will no longer see a *Play* button. In order to continue, you must go to the *Finished* button, select and click on *View Results*, look at your performance and evaluate your most recent efforts. Keep in mind that feedback on your performance affects your overall success, but do not let minor setbacks discourage you. To continue you must now select and click on *Continue Session*. This indicates to the computer that you are ready for the next portion of the lesson. Do not spend too much time between games because the program is designed to progress through many levels in a 50 minute session.

If you do not want to play the computer-assisted game, then you may click on the *Finished* button to return to the main menu. Choose one of the seven games from the menu, select the *Finished* button from that game screen, and click *Clinician's Page*. This brings you to the clinician's choices. You do not have to be a clinician to use this page. These choices are available for extra practice in specific areas. You must be aware however, that progress in a select level will never *ever* advance your computer-assisted level. When you return to the computer-assisted game it will go back to your last saved level. For example, if you are at *Triangles and circles* for the *Change* game and you want to return to *Numbers 1 and 2* for additional practice, you will not be sent back to *Numbers* when you quit out of the clinician mode. You will be returned to where you left off at the last computer-assisted session. The same goes for jumping ahead and practicing the hardest levels. You may want to sample the harder levels, but it is recommended that you work through all the levels as this will train the different areas of attention that the program is designed to address (focused, sustained, alternating, and divided).

Overview of the seven games and the Über Tasks

Change

In the *Change* program you see one stimulus at a time and decide whether you should respond to the stimulus or inhibit a response and wait. If you are supposed to respond, the computer measures how long it takes you to register that stimulus, make a decision, and carry out the decision. These are measured as "% correct" (accuracy) and "response time." If you make a wrong decision and click on a target when you are supposed to ignore the target, you have made an error of commission. This is reported as "% incorrect." If you are supposed to hit a target and you don't, it slips by you, this is an error of omission. It is recorded as "% missed." If you whack at the mouse when you are supposed to be waiting, these are impulsive errors that are recorded as "extra hits." The goal is to be accurate and fast with no impulsive (extra hit) errors. We require *accuracy, consistency, and speed*. We define *accuracy* as 85-100% correct responses. *Consistency* means responding at this percent accuracy for four minutes at a stretch. The goal for *speed of information processing* is a reaction time below .6 seconds. For most individuals, the stimuli themselves are not challenging until the auditory confusions are presented (2/moon; b/3). The challenge lies in increasing the rate of stimulus presentation, increasing

the delay between stimuli (hard for the impulsive types), and increasing the variability between stimulus presentation times. (Inconsistent display times require more vigilance because you can't anticipate when the stimuli is going to appear.) If you have a problem with impulsivity, play the game with the *recall delay* option to practice waiting a few seconds before responding to a stimulus.

You begin your treatment program by practicing both *Visual Change* and *Auditory Change*. We expect that it will take four minutes a day for each, i.e. eight minutes a day to play *Change*. By day 35 you will probably be finished with *Change* and will be spending the eight minutes on *And one more thing...*, *Functional Memory*, or *Dominoes*.

Zydeco

Zydeco is played three ways each session for about four minutes each: *Auditory*/*Visual (*sequential tones and colors*); Auditory (High*/*Low)* for pitch discrimination*; and *Functional (*word sequences*).* The important features of *Auditory*/*Visual Zydeco* are the span (length) of information to remember and the speed that the stimuli are presented.

Auditory/Visual Zydeco
In the first level one sound is presented and you make your responses in a field of two bars. Success at this level moves you from one sound to three sounds with two bars to show the pattern. You then move to 3-5 sounds in the span and show the sequence using four bars. The sounds are .5 second long and there is one second between the sounds. The harder level increases the span (5-7) to up to seven and you show the sequence using six bars. The length of the sound and the interval between sounds stay the same.

After you succeed at the longer interval, the game repeats with a shorter interval between sounds. You hear different types of sounds in place of the simple pure tones presented in earlier levels. When you can remember a sequence of seven rapidly presented sounds with 100% accuracy on 4/6 trials, then you are finished with *Auditory*/*Visual Zydeco*.

Auditory (High/Low) Zydeco
The goal of *Auditory (High*/*Low) Zydeco* is to perceive the number and sequence of rapidly presented pure tones. Treble and bass clef symbols represent higher pitched and lower pitched sounds, respectively. After listening carefully to the auditory pattern, indicate whether you hear a high or a low sound by clicking on the appropriate clef symbol or by using the up or down arrow. The sounds are initially presented for .5 second with an interval between sounds of one second. The span increases from 1-7 tones. When you are consistently accurate at .5 presentation, the presentation length shortens to .3 and the interval between stimuli shortens to .5. You work from a span of 1-7 again. Consistent accuracy is 100% for 4/6 trials with a span of seven. At the most difficult level the stimulus presentation length is .15 and the interval between stimuli is .3 second.

Functional Zydeco

Functional Zydeco prepares you to play *And one more thing...* and *7 ± 2*. You are required to hear and remember real items found in a category (i.e. animals, colors, etc.). As the computer presents the sequence you rehearse it one item at a time, and you have the interval time to process the next item in the sequence.

A fast interval of .3 second is commensurate with running speech.

The stimuli are presented in normal speech with a one second interval between words. The response option is to click on the words (a word bank is on the screen) in the order of presentation. The words pop onto the bars in the order that you click on them. To erase a word, click on the word in the bar and it returns to the word bank. The span increases one word at a time until it reaches six words. The speed of stimulus presentation increases until there is only a .5 second interval between words.

When you are accurate and consistent at the .5 interval, you are asked to hold on to the information for a few seconds before you are allowed to respond. (This is similar to having to remember a telephone number while you hunt for a pen.) The recall delay feature kicks in, and you are required to wait five seconds before making your response. The easier to harder feature is active, meaning that when the computer first presents the delay, you only have to remember one target for five seconds. Eventually, you will remember six targets for 20 seconds before responding. Because we know that life is not predictable, you also have to practice delaying your response for an indeterminate amount of time. You are asked to wait for zero to 20 seconds. You won't know ahead of time, so you have to be flexible. If you don't think this is challenging enough, go to the *Clinician's Page* and select another variable for recall delay. Challenging choices include 30 and 40 seconds, variable from zero to 20.

When you begin your treatment you play all three types of *Zydeco*: *Auditory/ Visual; Auditory (High/Low); Functional*. Each one takes about four minutes. As you complete each level the time you would have spent playing *Zydeco* is transferred to *And one more thing…, Functional Memory*, or *Dominoes*.

7 ± 2

7 ± 2 is a complicated program. We expect that you will play *7 ± 2* on the first day of therapy and on the last day. Research indicates that the average adult can recall seven-plus-or-minus-two digits forward for a range of 5-9 digits. This phenomenon is termed the "magical number seven, plus or minus two" (Miller, 1956). The range of "normal" for recall of digits reversed is 3-7. Eighty-three percent of 20-year-olds can recall 6 forward, and eighty-eight percent recall 4 reversed. Sixty-eight percent of 60-year-olds recall 6 forward, and seventy-seven percent recall 4 backward. While we seem to have a finite capacity, there are strategies to bypass the capacity limits. The most common of these is chunking. We suggest that you develop digit recall to the highest single digit string that you can, then learn to chunk groups of digits together. Long phone numbers and social security numbers are chunked this way. There is then essentially no limit to the number of items you can learn to remember in a span. Head injured individuals usually struggle to remember 4-5 units forward and 2-3 units reversed. In order to function more effectively in today's information loaded world, it is reasonable to force yourself to recall seven digits forward and five in reverse. If you are good at this task, push yourself to nine forward and seven in reverse.

The game is designed to allow you to practice up to 15 with or without chunking strategies. We did not put chunking strategies into the computer-assisted treatment plan because we think chunking is a different task altogether. The act of chunking several items together makes a longer span into a shorter,

easier to remember unit. This process has value in and of itself and is included as an option on the clinician's page.

Digit span backward measures attention, concentration and working memory. You must receive the information, hold it, do something with it, and then show that you have manipulated the information. Digits reversed is sensitive to brain injury. Individuals with learning disabilities may also have difficulty with digit span forward and reversed. Approximately half of the neurotypical adults under the age of 55 can recall 5 digits reversed. Approximately 30% of 89-year-olds can recall 5 digits reversed (Wechsler, 1997). Typical seven-year-old children can recall 5 digits forward and 3 reversed. At 10 years most can recall 6 digits forward and 4 reversed. By the age of 14 the memory span forward is consistent with that of the adult performance, with most children being able to remember 7 forward and 4 reversed. By age 18 the full range will include 7+/-2 forward and 5+/-2 reversed. However, formal testing and evaluation is the best way to determine the range of normal for a particular age group. These estimates are provided for a general guideline based upon current standardized tests (Wechsler, 1997 and Webster, 1998).

In addition to digits, we chose letters, colors, shapes, Greek letters, and simple designs that are duplicated or rotated in order to make them visually distinct. The visual presentation of *7 ± 2* includes all stimuli types, a span range of 1-7 and four different presentation types (presented one at a time and the stimuli stay up on the screen until the whole span is visible; presented one at a time but only one number is visible at a time; presented one at a time in the center of the screen and you must mentally sequence them left to right; presented one at a time in the center of the screen - you sequence them, reverse them, then demonstrate that you have manipulated the information).

You move gradually through the stimulus types and presentation types. The length of the span is determined by your accuracy. The greater the accuracy, the longer the span. When you make two consecutive errors your span will be shortened. If you are having a really bad day, you may be excused from the session early and moved to another task. Otherwise, expect to spend 10 minutes playing *7± 2*.

The *Auditory* presentation of *7 ± 2* has fewer levels than the *Visual* presentation. You complete only numbers, letters, colors and shapes for *Auditory 7± 2*. This is because simple designs cannot be reliably labeled, and Greek letters are unfamiliar to most people for auditory presentation.

We want you to move through the levels as quickly as possible if they are not at your "challenge" level. We think a challenge ought to work your brain but not let you practice incorrectly. Therefore, you may initially get a span of one correct and move to two then three, but when you hit a span of four we want to be sure it is not just a fluke that you were able to get it correct. We ask you to do the span correctly for four trials before you move to the next level of difficulty. We ask for 100% accuracy for four consecutive trials. For a greater challenge and to improve your digit span memory to better than average levels, go into the *Clinician's Page* to practice both an increased span (up to 15) and chunking.

Scanning	*Scanning* starts as a simple cancellation task and rapidly moves to a "whack a mole" cancellation task where the goal is to hit as many correct targets as you can in the time allotted. The screens reset, so the faster you whack the more targets you get to hit.

You advance from colors to letters/numbers when you successfully find lots of targets in a moving field and/or when the target changes. We want to know that you can find lots of targets when the field is complex and moving (scrolling) and/or when the target changes from one stimulus to another, and that you have endurance (10 minutes). So, 5 minutes of the 10 have to be consecutive in one treatment session. The 10 minutes advance rule (moving to the next level) can be a combination of playing the change option of *Scanning,* the scrolling option, and/or the scrolling option + the change option in a session. The results are reported in this way: "You found *x%* of targets in *y* minutes, *n* seconds of play with the stimuli *z* (colors) in a field of *f* (2->50) with the presentation type *p*." When you are successful at "whack a mole" we change the goal slowly. When you move to *Find letters/numbers* you still zip through the easy fields if you can, and the number of things to whack at will vary from greater to smaller the longer you are on the level. In other words, when you start *Letters/numbers, regular* (the level with no changing or scrolling) *35* (the number of objects in the field) you whack at 10 targets. The targets gradually get harder to find, and we don't tell you how many you have to find. The screen resets when you find the correct number. Eventually you are only looking for three targets, the field is *Many,* and the change and scrolling functions are on.

You advance to *Find and remember letters or numbers* when you have played 10 minutes etc. like the rule on colors but with only three targets.

Find and remember letters or numbers starts out on an easy level with one item to find in a field of two. You get a prompt in the text box to "Hit the *I'm Ready* button to continue." (Now we will tell you how many to find!) At harder levels (*35 Objects, Many Objects)* you practice remembering 3 letters or numbers. The keyboard is active at this point. You won't be able to use the mouse or touchscreen like on "whack a mole" because the screen disappears when you click *I'm Ready*.

The program has now switched over from a cancellation task in a gradually more complex field to a visual memory task in a complex field. Now we care about how fast you find and enter the answers into the computer. The length of time on task is no longer important, but accuracy and speed are what we measure. The results page will state: "You found *94.1%* of targets with the stimuli *Find and remember letters or numbers* in a field of *35* with the presentation type *Scrolling (Targets move across field)* and an average response time of 0.68 second.

You will be allowed to advance levels when the time needed to find the targets improves. We expect that on *level 35* time to find targets should be < 15 seconds and on *Many* it should be <20 seconds. You need 86% accuracy at <15 seconds on 13/15 consecutive attempts.

And one more thing… The purpose of *And one more thing…* is to teach verbal rehearsal strategies for improving functional working memory and to decrease the occurrence of errors such as repetitions (perseverative errors), additions (intrusion or recognition errors) and omissions (signaling a memory problem). You listen to a list of common related or unrelated items while the list is continually updated. Initially the items will only be *added* to the list, but as the difficulty increases, items will be added *and* deleted. This is imitative of making an ongoing grocery or to-do list. The third element will include the first two (addition, deletion) in a conversational context format. The samples are similar to note taking in class or a back and forth discussion of items to include on a list, with a conversational tone. The strategies to practice are note taking, verbal rehearsing, paraphrasing, chunking information units, visualizing for comprehension, organizing and dual coding for storage and processing. There is a "tape recorder" available on each page in order to practice these strategies. This will allow you to listen to the target, process the information and tape your response. The message can then be played as many times as necessary in order to practice the expressive written task of note taking. Eventually the goal is to either learn to effectively use a tape recorder for a cognitive aid and/or to increase the speed at which auditory information can be transcribed to paper or computer.

Functional Memory Independent practice with improving working memory stores may improve functional working memory, however some children and adults may have a more difficult time generalizing the strategies without direct practice. Therefore, we have included activities that encourage the dual processing tasks of memory and comprehension at the sentence and paragraph levels. There are multiple choice tasks as well as open-ended tasks. This allows the clinician flexibility in planning treatment sessions and provides an opportunity for receptive and expressive language treatment. The multiple choice format accesses recognition memory. Paragraph comprehension requires you to access both long term crystallized knowledge and the new information presented in the paragraph in order to answer the factual questions. Demonstration of comprehension requires information to be held in working memory, stored in long term memory, and then retrieved from long term memory storage. In addition to accessing knowledge, the questions for each paragraph require complex thinking skills. There is always a main idea question and there is at least one of the following: drawing conclusions, inferring, or predicting.

To retrieve and recall information many cognitive processes are activated. One must be able to initiate the desire to remember the information, sustain attention on the information to be retrieved and then switch to new pieces of information if the information retrieved is not relevant. One must be able to recognize relevant from irrelevant information and not get stuck and perseverate on irrelevant facts. Then a mental rehearsal of the retrieved information is required and verbal skills are employed to sequence the message, organize the important elements in a hierarchy of importance then apply it to the question that was originally asked. The reading comprehension paragraphs from *Functional Paragraphs* and the ability to locate relevant facts in the *Functional Scanning* tasks require the client to generalize the specific attention and memory

skills developed in the previous specific skill development tasks.

Dominoes   The Dominoes game provides a fun way to work on all five types of visual attention--focused, sustained, selective, alternating, and divided--and on functional memory. All of the games on the CD require focused and sustained attention. In Dominoes you must use selective attention when deciding what tiles you'll need to use to match existing tiles. Alternating attention comes into play as more and more tiles are placed on the game board. You move your eyes back and forth from the board to your own tiles to compare and evaluate which tiles will match and which won't. Finally, when the interfering *Über Tasks* occur, your attention is divided between completing the *Über Task* and the Dominoes game. The option of putting math facts on the tiles allows the clinician to work on functional memory.

Über Tasks   Über (oober) is a German word meaning "over". We have an image of the *Über Tasks* as umbrella-like tasks. They cover all of the games instead of being part of one particular game. We define Über as a series of tasks that will interrupt the therapy session in order to "distract" you from the task you were working on. You have to hold the task in working memory, shift attention to another task, shift attention back to the original task, and retrieve the information you are holding in working memory. In the initial stages of treatment the Übers occur between activities. For example, after signing in you are asked to remember three things and are told that you will be asked to repeat those three things approximately five and 20 minutes later. After you finish with five minutes of "*Change*" the computer will pause what you are doing and ask you to enter in the three things to remember. This is an *Inter-Task Über*.

The *Inter-Task Übers* come anytime during your treatment session and you will probably be asked to remember something for longer than a few seconds. The difference between Inter- and Intra-Tasks is the length of time you will be required to hold on to the information.

Intra-Task Übers will interrupt you, but after answering the question you may go back to the task and you won't have to put anything into long term or proscriptive memory. Examples of Intra-Tasks are: Who is in the room (personal open ended); Was the first president Lincoln or Washington? (closed multiple choice); You noticed a spot on your collar, what should you do? (open-ended complex). See appendix for the list of suggestions for Übers. **You may create your own personalized Übers.** See *User's Lists* to individualize the Inter- and Intra-Tasks. Examples of *Inter-Task Übers* are:
Example 1: Three things to remember (In five minutes I will ask you to say these three words: rose, hamburger, sweater.)
Example 2: Telephone (Write down a telephone message.)
Example 3: Taco Shop (Pay attention to when your order is ready.)
Example 4: Proscriptive memory (In a few minutes, you'll need to remember to _____.)

The *Über-Tasks* will increase in frequency the longer you have been in treatment. You may practice the *Über-Tasks* by themselves the way you might complete workbook tasks. Access *Über-Tasks* for workbook type practice through the *Über Workbook*..

Other Clinical
Applications

Exploratory research indicates that cognitive training in non-linguistic skills positively affects both L_1 and L_2 in bilingual aphasia (Kohnert, 2004). Evidence exists to demonstrate a link between verbal working memory and Specific Language Impairment (Montgomery, 2002). It appears that problems that Specific Language Impairment (SLI) children have in non-word repetition tasks are not related to encoding and analyzing word structure, but due to problems in divided attention (Marton and Schwartz, 2003). A number of researchers, including Susan Weismer, have looked at the limitations in working memory capacity in children with SLI. Findings from a study using a dual-processing task suggest that children with SLI have difficulty holding on to multiple pieces of linguistic information simultaneously. Weismer and her colleagues hypothesize that this difficulty is due to restrictions in working memory capacity (Weismer, 1999).

A&M II is suggested for children and adults with: attention deficit disorder; frontal lobe syndrome; executive function disorders; Specific Language Impairment; Autism; Traumatic Brain Injury; Aphasia; Phonological Processing Disorder; Auditory Processing Disorder; problems with concentration, organization, and self-regulation; language comprehension disorder; deficits in memory storage and retrieval of information; verbal working memory disorder; grammatical/syntax disorder; sequential memory disorder; problems with sustained auditory and visual attention; bilingual individuals with aphasia and/or individuals with neurocognitive impairments such as schizophrenia and bipolar disorder.

Executive function disorders and disorders of working memory affect an individual's ability to self-regulate behavior and use meta-cognitive strategies to adequately function in academic, social, and work-related situations. Empirical evidence indicates that treatment that strengthens the underlying cognitive processes generalizes to non-trained language-based tasks (Kohnert and Windsor, 2004).

Components of Attention Addressed in Each Game

	Focused	Sustained	Selective	Alternating	Divided
Change	X	X	X *(Distractors on)*	X	X *(Übers on)*
Zydeco	X	X	X *(Distractors on)*		X *(Übers on)*
7 +/- 2	X	X	X *(Distractors on)*		X *(Übers on)*
Scanning	X	X	X	X	X *(Übers on)*
And one more thing…	X	X	X	X	X *(Übers on)*
Functional Memory	X	X	X	X	X
Dominoes	X	X	X *(Distractors on)*	X	X *(Übers on)*
Über Workbook	X	X	X	X	X

Notes to the Clinician

A&M II addresses the deficits of executive function disorders and disorders of working memory that affect an individual's ability to self-regulate behavior and use functional strategies. Executive functions include: *inhibiting actions, restraining and delaying responses, attending selectively, setting goals, planning and organizing, as well as maintaining and shifting set* (Singer and Bashir, 1999). Self-regulation *refers to a set of behaviors that are used flexibly to guide, monitor, and direct the success of one's performance. They are also used to manage and direct interactions within the learning environment in order to ensure success* (Singer and Bashir, 1999).

The computer-assisted treatment plan will take approximately 50 hours. The clinician does not have to supervise all 50 hours. The program advances in difficulty as the client achieves accuracy, consistency and speed at each level. **Be sure to Sign In for each session so that the computer can keep track of each client's place in the treatment plan**. The sign-in screen is the first screen of the CD. These automatic levels can be bypassed by playing from the *Clinician's Pages* and developing an individualized protocol.

Establish a Treatment Plan:

Explain to clients, in age appropriate terms, their individual strengths and weaknesses. Explain the purpose of each program and why they are working on this program. It is critical that the child or adult knows *which* program they are working on and *why*. Fill out an individualized treatment plan with the client. Establish the goals, estimate the expected time to achieve the goals, and evaluate the performance. You may use the sample goal sheet included in the Adobe Acrobat (.pdf) files on the CD.

Each lesson has been organized to focus on specific functions. The lessons should take approximately 50 minutes each. This gives the therapist flexibility with planning the treatment session. If attention is the primary goal, a one hour therapy session may primarily utilize the computer-assisted instruction. It is also expected that the client will work at home on the computer-assisted treatment plan. If the therapy session is 20-30 minutes, the lesson will be divided into multiple sessions and the starting and stopping points will be recalled when the client returns and signs in. If this is a learning lab, you could have several children completing individual lessons on the computer and alternate students for one to one work. If this is a community college lab, you could have student assistants giving one to one help as needed as you rotate among the students working on the lessons.

Computer-assisted and Clinician-guided Protocols:

There are three ways to use the program: computer-assisted, clinician-guided, and a combination of both. The default is the computer-assisted treatment protocol. This protocol was designed for the "average" individual with executive function disorder. Since we know that no one is average, there will be times when you will need to access the *Clinician's Pages* to individualize the client's program. The *Clinician's Pages* allow you to target a particular area or dimension (e.g. recall of information after delay). For instance, you may be working on *7 ± 2* and discover that while your client can recall the 7 numbers immediately, he cannot recall the information with a delay of 10 seconds in noise.

You switch over to the *Clinician's Page* for *7 ± 2*, you add the option "*Response Delay*" and "*Distractors- on*" and practice 20 presentations of 7 spans. When you return to the game using the *End Clinician Mode* button, you will be playing under your "sign in" name and will return to the level at which you left the game. You are not going "backwards." You are targeting a particular area of weakness, strengthening the weakness, and then moving through the protocol as designed.

Advanced Concentration and Problem Solving It is possible that some individuals may rapidly move through the "average" protocol and will need a specialized "advanced concentration" protocol. Go to the *Clinician's Page* from the *Finished* button on any game screen to access these options.

Change The more difficult levels are 9 and 10 in which the client must determine whether multiple stimuli are the same or different. Make the task even more challenging by choosing *Target Visible* from the *Clinician's Page* and selecting *Variable*. The *Recall Delay* feature requires that the client hold the correct answer in memory and wait to respond. This helps decrease impulsivity and improve memory.

Zydeco The difficulty level can be changed by increasing the initial number of stimuli, setting the *Recall Delay*, allowing for an inconsistent interval between stimuli presentations, and adding distracting noises.

7 ± 2 An increased span is the most obvious change that can be made for increasing the difficulty of this task (Go to the *Clinician's Page* and click on *Span*). The spans range from 1-15. Some individuals have more difficulty with one type of stimuli over another. It is likely that the "nonverbal" figures and designs are more difficult to remember than the more linguistically recalled numbers, colors, shapes, and letters. Another way to increase the complexity of this task is to require a delay between seeing the stimuli and making the response. This is controlled in the *Recall Delay* option. The *Interval* between stimuli can be shortened to .5 second and this requires a more rapid encoding of the information.

Scanning In order to make scanning more difficult the options *Recall Delay*, *Stimuli scroll across screen* (on the *Clinician's Page*) and *Distractors* (on the game page under *Options*) can be turned on. The *Find and remember* level is also difficult because the numbers or letters must be located, held in memory then typed in after a delay. Increase the length of the delay in order to increase the ability to hold on to the information even with time and other interfering factors, such as noise.

And one more thing… The difficulty levels for this game are twofold: the amount of information that you are required to hold on to and the amount of extraneous information that you are exposed to and need to ignore.

Functional Memory The most difficult level of this program is the paragraph level, which includes problem-solving and life issues paragraphs. The problem-solving paragraphs are text only and each is followed by four comprehension questions. There is

always a main idea question, there are two factual questions, and there is one of the following: drawing a conclusion, inferring, or predicting. The life issues paragraphs are text plus audio, so the client can listen to the story and follow along. Each of these paragraphs is followed by four multiple choice questions. There is an option to hide the text of the paragraphs so the client cannot look back for the answers.

Dominoes   To work their clients' retrieval memory, clinicians will want to choose levels 6, 7, 8, and 9--the math facts of addition, subtraction, multiplication, and division. The client must know the answers to the problems to match the tiles. For teenagers and adults who learned the math facts as a young child, this activity accesses long term crystallized knowledge and is a great task for functional memory work.

Über Tasks   Different combinations of programs plus *Über Tasks* will be challenging for different clients, depending upon the nature of their deficits. Someone with an Attention Deficit Disorder will find it very difficult to play *And one more thing...* when items are being both added and deleted, and *Über Tasks* that require the client to remember a number of items are interrupting the task. A client with memory storage and/or retrieval problems will find it very challenging to play *7 ± 2* while even the simplest *Über Task,* such as stopping to name all of the people in the room, is interfering. Clinicians will be able to tailor a challenging task for their high level patients using combinations of programs plus *Über Tasks*.

Objectives

Change	Training; Filled red and black squares; Numbers 1 and 2; Triangles and circles; Letters x and o; Outlined red and black squares; 2 and moon; b and 3; Simple designs; 2 stimuli-same/different; 4 stimuli-same/different
Objective	The client will sustain and alternate attention to discriminate between two alternating targets. The client will also inhibit impulsive responses. Stimuli can be presented auditorily or visually.
Zydeco	Auditory/Visual Zydeco; Auditory (High/Low) Zydeco; Functional Zydeco
Objective	The client will maintain attention and vigilance in order to discriminate between target sounds in sequence.
7 ±2	Forward-whole span; Forward-sequentially; Forward-centered; Reversed
Objective	The client will attend and utilize auditory and/or visual memory to recall a span of symbols in order, to improve sequential visual and auditory processing.
Scanning	Filled or empty shapes; Colors; Letters or numbers; Memory for letters or numbers
Objective	The client will maintain attention and vigilance in order to visually scan the screen and select salient information (targets) in a gradually increasing field of complexity (2->50). When the target changes, the client will hold in memory the new target and select it while inhibiting the response to select the previous target.

And one more thing...

	Training-Demonstration of note taking skills; Activity 1-Single word dictation; Activity 2-Note taking in conversation; Activity 3-Note taking and revision in conversation
Objective	The client will attend to auditory-linguistic information, hold the necessary information in working memory and demonstrate the functional strategies of typing or dictating information. The span of linguistic information will increase from one item to several items within and between categories with addition and deletion of salient items.

Functional Memory	Scanning; Sentences; Paragraphs
Objective	The client will attend and utilize auditory and/or visual memory to process, remember, and use information presented at the single word, phrase, sentence, and paragraph levels.
Dominoes	Dots 1-10; Numbers 1-10; Colors; Simple Shapes; Greek Letters; Addition; Subtraction; Multiplication; Division
Objective	The client will choose the target from a field of 1-5 tiles, select the tile, select the rotation if indicated, rotate the tile, then align matching tiles on the Domino grid.
Über Tasks	Intra-Tasks; Inter-Tasks; User's Lists
Objective	The client will follow the directions for completing each *Über* (oober) *Task* and will then return to and complete the primary task.

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Savings:	aolpf5.marketwatch.com/news/story.asp www.AmericanSavingsEducationCouncil.com
Investments:	www.set.or.th/en/isc/education/rewards/rewards
Budgeting:	money.cnn.com/pf/101/lessons/21
Receipts:	www.nolo.com/lawcenter/ency/article.cfm/objectID www.blueravenbusiness.com/bookkeepingtips.htm
Interview skills:	www.bc.edu/bc_org/svp/carct/interviewduring.html
Swearing at work:	www.mckennan.org/hubs/for%20employers/hot_tips.html
Sexual harassment:	www.jhllp.com/DiscrimQ&A.htm www.eeoc.gov/facts/fs-sex.html
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Internet use:	www.virtualcs.com

2 Change

Training; Filled red and black squares; Numbers 1 and 2;
Triangles and circles; Letters x and o; Outlined red and
black squares; 2 and moon; b and 3; Simple designs;
2 stimuli-same/different; 4 stimuli-same/different

Objective   The client will sustain and alternate attention to discriminate between two alternating targets. The client will also inhibit impulsive responses to non-targets. Stimuli can be presented auditorily or visually.

How to Play   A target stimulus is identified in the bottom right corner. This is the initial target. The client hits the spacebar or clicks the mouse each time the stimulus is presented in the center of the screen. When the word "change" appears the client must shift to a new target and ignore the previous target. Accuracy and reaction time are measured. The speed of target presentation increases until the client responds accurately at .5 second. At the training level, the word "hit" appears at the bottom of the screen whenever the client is supposed to respond to the stimulus.

Response Options   *Keyboard: Press the spacebar when the stimulus is displayed.*
Mouse: Click on the screen when the stimulus is displayed.

Options   [Clinician's page]
Feedback - When this option is On, the computer will remind your client of the current target as soon as a mistake is made. Turn this option Off if you want to do a pre- or post-test.
Time per Trial - Choose the length of time you want each trial to run (1, 2, or 5 minutes).
Recall Delay - Make the task more difficult by asking your client to wait before responding to the stimulus. Recall Delay can be set at 5 or 20 seconds.
Target Visible - Choose the amount of time the stimuli stay on the screen (5 to 15 seconds).
[Game page]
Help - Read an overview of the Attention and Memory: Volume II CD, instructions for each game, or an explanation of the *Über Tasks*.
Volume - Set the volume for the game you are in.
Distractors - Choose to have distractors play during the game (On) or not (Off).
Locked - Keep your client from exiting the game before he is finished. If you have chosen to have the *Locked* option on, you can turn it off any time by typing Apple U (Option U on Windows).

Game Results   Level, Stimulus Presentation, Display Rate (seconds), Recall Delay (seconds), Letter Options, Presentation Fade, Distractors, Average Response Time, % Correct, % Incorrect, % Missed, Extra Hits, Prompts Needed, Total time in game

Rationale   The ability to recall a target, change to a new target and inhibit the previous target calls upon executive function skills including working memory, impulse control and mental flexibility.

"Change is Bad" was the facetious title of this program. The inspiration comes from the human tendency to prefer consistency and sameness. Subsequent to head injury or neurological injury, change can become frustrating, anxiety producing and nearly impossible to deal with. The term *perseveration* refers to the unintentional repetition of an activity or word after it is no longer appropriate. The cause is an inability to shift attention. The *Change* program requires the establishment of a mental set, then a shift to a different target. The rapid shifting of attention and need to hold on to the ever changing target taxes the executive functions and the working memory. About halfway through the treatment program the mantra itself changes to, "Change is Acceptable" then "Change is Inevitable" and, finally, "Change is Good".

Alternative   The *Clinician's Page* allows customization of the game to focus on problem areas. Easier targets such as black/red may not be a problem for some individuals but auditory confusions introduced in b/3 and 2/moon may be more challenging. You need to exit from the computer-assisted program to practice different levels. To access the *Clinician's Page* click on *Finished* on any of the game screens.

Zydeco

Auditory/Visual Zydeco; Auditory (High/Low) Zydeco;
Functional Zydeco

Objective
The client will maintain attention and vigilance in order to remember tones or related words presented in sequence.

How to Play
The client clicks on the *I'm Ready* button and hears one note. The word "Wait" appears on the screen while the note is played. The words "Respond Now" appear on the screen when it is time for the client to respond. The client then clicks on the same colored bar that lit up when the note was played. That stimulus and response complete a cycle at the one note level. The visual prompt, *I'm Ready,* appears again. More notes are added until the client makes two errors. The treatment level is then adjusted to the level just before the one in which the client made errors. If the time has run out for this game, though, the client will be sent to the *Results* page.

Auditory (High/Low) Zydeco requires discrimination between only two sounds. The interval between sound presentation gets shorter and shorter until eventually the client is processing the difference between the sounds at the .3 second level.

Functional Zydeco presents common words for memory and sequencing. These words are presented one at a time until the client accurately recalls a sequence of six words. The words in *Functional Zydeco* are within-category words. To place a word in a bar, click on the word in the word bank. A good self-monitoring strategy for this level is to use the *Say Again* button to proof your work before using the *Check Answer* button. That way you get to see and hear your answer so that you can see if you need to change something. To change a word you already have in a box, click on the word.

Response Options
Auditory/Visual Zydeco
Keyboard: Press the spacebar to hear the stimulus.
Mouse: Click on the I'm Ready button to hear the stimulus. Click on the colored bars to respond.
Auditory (High/Low) Zydeco
Keyboard: Use the up and down arrows to respond.
Mouse: Click on the treble (high) clef or the bass (low) clef to respond.
Functional Zydeco
Keyboard: Press the spacebar to hear the stimulus. Select a number 1-6 corresponding to the word. Words will automatically be placed left to right in sequence in the colored boxes. Use the delete key to remove words from the boxes.
Mouse: Click once on the word. Words will automatically be placed left to right in sequence in the colored boxes. Click on a word to remove it from a box.

|	
Options	[Clinician's page] ***Recall Delay -*** Make the task more difficult by asking your client to wait before responding to the stimulus. Recall Delay can be set at 1, 5, 10, 20, 30, or 40 seconds, or make the delay Variable (1-20 seconds). ***Interval (.3-5 seconds) -*** Set the amount of time between stimulus presentations. Choices range from .3 second to 5 seconds. ***Time to Play -*** Set the amount of time to play this game. Choices range from 2 minutes to 30 minutes. [Game page] ***Help -*** Read an overview of the Attention and Memory: Volume II CD, instructions for each game, or an explanation of the *Über Tasks*. ***Volume -*** Set the volume for the game you are in. ***Distractors -*** Choose to have distractors play during the game (On) or not (Off). ***Locked -*** Keep your client from exiting the game before he is finished. If you have chosen to have the *Locked* option on, you can turn it off any time by typing Apple U (Option U on Windows).
Game Results	Trial, Stimulus Presentation, # of Bars, Interval (seconds), Recall Delay (seconds), Distractors, Sequences Mastered, Highest Sequence, Final Sequence, Elapsed Time (seconds), # of Sequences Played
Tempo	Interval range: 1-.3 seconds, with the option to choose up to 5 seconds
Rationale	The *Zydeco* task requires auditory discrimination of tones, auditory and visual memory, and auditory and visual sequencing to imitate the pattern. Auditory vigilance, the ability to sustain auditory attention over time, is practiced as the sequences continue and increase in difficulty. Auditory processing is a temporal skill, i.e., time-based. Echoic memory is the ability to hold on to the auditory stimulus. *Zydeco* presents non-speech sounds as well as speech sounds for auditory discrimination, memory and sequencing practice. Auditory memory of small units is required in order to be successful with recall of longer, meaningful sentence level units. The purpose of the sequences, then, is to increase the auditory memory span and keep intrusion errors from occurring.
Alternative	The *Clinician's Page* allows the clinician to customize the game to focus on problem areas. Exit from the computer-assisted program to practice necessary levels. To do this, access the *Clinician's Page* by clicking on *Finished* on any of the game screens.
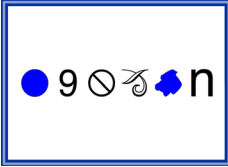
7 ± 2

Forward-display whole span; Forward-sequentially;
Forward-centered; Reversed

Objective   The client will attend and utilize auditory and/or visual memory to recall a span of symbols in sequence, to improve sequential visual and auditory processing.

How to Play   The client clicks on the *I'm Ready* button to begin. The computer presents the stimuli, the client holds the target(s) in memory, then selects a response from the bank that appears on the screen. When the client clicks on a stimulus in the bank, it appears on the line above. When the response is complete, the client clicks *Check Answer* for immediate feedback on response accuracy. If the client accidentally clicks on the wrong stimulus, the stimulus can be removed from the line by clicking on it or hitting the delete key. After several correct responses the span increases. When the client makes two errors on a level, the computer automatically reduces the span by one on the next trial. Visual complexity of the target increases the level of difficulty. Not all levels are included in the computer-assisted program. See below for alternative play options.

Response Options   *Keyboard: When the stimuli are numbers, type them in to respond.*
Mouse: Click on the target item in the bank on the lower half of the screen to respond.

Options   [Clinician's page]
Feedback - When this option is On, the client will be able to check her answer by clicking on the *Check Answer* button. Turn the feedback Off if you want to do a pre- or post-test.
Chunking - Turn this option On if you would like the computer to present the stimuli in groups with pauses in between.
Span - Choose the number of items in the span (from 1-15 items).
Bank Size - Manipulate the bank size to include foil items. This adds an element of distraction and interference to the task. There are some limitations to this option. For example, there cannot be 10 *extra* numbers because there are only 10 numbers total.
Correctable - Decide whether you want your client to be able to make corrections (Yes) or not (No).
Recall Delay - Make the task more difficult by asking your client to wait before responding to the stimulus. Set the delay time to 5, 10, 20, 30, 40, 50, 60 seconds, or make the time unpredictable by selecting Variable.
Interval - Set the amount of time between stimulus presentations to 1, 3, 5, 10, or 20 seconds).
[Game page]

Help - Read an overview of the Attention and Memory: Volume II CD, instructions for each game, or an explanation of the *Über Tasks*.
Volume - Set the volume for the game you are in.
*Distractors -* Choose to have distractors play during the game (On) or not (Off).
Locked - Keep your client from exiting the game before he is finished. If you have chosen to have the *Locked* option on, you can turn it off any time by typing Apple U (Option U on Windows).

Game Results	Percent Correct, Span, Elapsed Time, Stimulus Type, Presentation Type, Bank Size, Recall Delay (seconds), Time Visible (chosen as *Interval* from the *Clinician's Page*), Show Scoring, Correctable, Fade Stimulus, Distractors (if turned on), Mastered, Total Time in Game
Rationale	*7 ± 2* is designed to improve sequential auditory and visual processing. Our experience indicates that individuals over the age of seven are at a disadvantage if they are not able to process seven digits, even though the "norm" is 5-9 digits. When using this activity to improve short term memory, we suggest that the digits be recalled individually, i.e., 8, 3, 4, 5, etc. Chunking is recommended only after the client has successfully recalled nine digits individually. The reasoning is that a nine-digit number broken into three chunks is not stretching the memory capacity as much as remembering it as a nine-digit number. Strategies to improve memory past the nine-digit mark include chunking, visualizing the numbers or re-auditorizing the information and hearing yourself say the numbers.
	Recall of the span backward utilizes concentration and working memory. Non head injured individuals typically have only one or two units difference between forward and backward memory.
Alternative	The *Clinician's Page* allows repeated practice at all skill levels and complexities. Exit the computer-assisted program to practice a desired level more extensively. Some individuals may only be successful with the digit span or letter span levels. Because each stimulus type has a visual, auditory, linguistic, and familiarity component, choosing the targets that are most troublesome for a client is an individualized process. The core program progresses through numbers 0-9, letters A-Z, colors (10), simple shapes (10), Greek letters (28), simple designs (29), and a mix of all. Presentation is first visual then auditory, and the method of presentation changes from an entire visual chunk to single units that must be visualized and conceptualized as a chunk. The final level reverses the targets. Each target can be played at any level of complexity from the *Clinician's Page*. This allows focus on visual-perceptual skill development, memory span, or stimuli presentation practice (i.e. sequentially, centered, etc.).
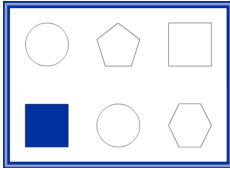
Scanning

Filled or empty shapes; Colors; Letters or numbers;
Remember letters or numbers

Objective The client will maintain attention and vigilance in order to visually scan the screen and select salient information (targets) in a gradually increasing field of complexity (2->50). When the target changes, the client will remember the new target and select it while inhibiting the response to select the previous target.

How to Play The target stimulus is identified near the bottom of the screen at the start of each trial. The client remembers what the target is and selects as many of the targets as possible in the time allotted. (Time to Play default is 2 minutes or 50 responses). The stimuli include: filled/empty shapes; nine colors; letters and numbers. The field complexity (2- >50 objects on the screen) and the scrolling field are the significant variables in the difficulty of the program. When the client correctly clicks on a stimulus, the stimulus is highlighted in green. If the client clicks again on an already highlighted stimulus, the response is counted as an error. NOTE: when the screen is scrolling, the client must click slowly and deliberately on each object in order for the computer to register the click and provide feedback.

Response Options *Keyboard: Type the letter or number on the keyboard (colors and shapes do not have a keyboard response option).*
Mouse: Click on the target.

Options [Clinician's page]
Feedback - When this option is On, the computer will remind your client of the current target as soon as a mistake is made. Turn this option Off if you want to do a pre- or post-test.
Stimuli Display - Choose to Erase the stimuli once they have been clicked on, or choose to keep them on the screen by selecting Keep Up. Erasing the items causes the field to become less and less distracting by reducing the number of items on the screen.
Recall Delay - Make the task more difficult by asking your client to wait before responding to the stimulus. Set the delay time to 5 or 20 seconds.
Time to Play - Set the amount of time to play this game. Choices range from 2 minutes to 30 minutes.
[Game page]
Help - Read an overview of the Attention and Memory: Volume II CD, instructions for each game, or an explanation of the *Über Tasks*.
Volume - Set the volume for the game you are in.
Distractors - Choose to have distractors play during the game (On) or not (Off).
Locked - Keep your client from exiting the game before he is finished. If you have chosen to have the *Locked* option on, you can turn it off any time by typing Apple U (Option U on Windows).

Game Results	Percent Correct, Elapsed Time, Stimulus Type, # in Field, Presentation Type, Distractors (if turned on), Correct Stimuli Visibility, Recall Delay (seconds), Total Time Played (measures the total time the client was in the program as opposed to the amount of time the client was actually playing)
Rationale	The client will improve strategies for visual scanning and memory for multiple stimuli in fields of 2 to >50. Unsystematic strategies for scanning are an indication of poor organizational skills. Observe the initial scanning pattern, then teach a systematic process. Typically, a left to right, top to bottom scanning pattern is preferable. Some individuals prefer a columnar approach. Haphazard spotting is not considered to be efficient. Visual field cuts, neglect and inattention present as errors of omission (failure to cancel targets). The client may need to learn to turn their head to compensate for hemianopsia or visual neglect. Errors of commission (cancellation of foils) record as extra hits. Efficiency is measured by improved accuracy and speed of task completion.
Alternative	The *Clinician's Page* allows the clinician to customize the game to focus on problem areas. Exit from the computer-assisted program to practice necessary levels. To access the *Clinician's Page* click on *Finished* on any of the game screens.

And one more thing...

Training-Demonstration of note taking skills;
 Activity 1-Single word dictation;
Activity 2-Note taking in conversation;
Activity 3-Note taking and revision in conversation

Objective

The client will attend to auditory-linguistic information, hold the necessary information in working memory and demonstrate the functional strategies of typing or dictating information. The span of linguistic information will increase from one item to several items within and between categories with addition and deletion of salient items.

How to Play

The client listens to each stimulus, remembers the word(s), utilizes the recording option to dictate the stimuli then types the stimuli onto the notepad. The client and/or clinician individually or jointly evaluate(s) the correctness of the entry by choosing the *Check Answer* button. The client's responses on the *Response Pad* are compared to the *Answer Pad* and the clinician or the client scores the responses as: **C**orrect, **I**ncorrect, **O**mitted, or **R**epeated (item entered more than once). Here, the clinician can determine the level of correctness to be achieved. For example, if the student types in "bulgar wheat" instead of "bulgur wheat" the clinician can score it as correct or incorrect depending on whether correct spelling is required. After the appropriate button (C, I, O, and/or R) has been clicked for each item on the *Response Pad,* the correct button has been clicked to indicate whether the client or clinician entered the responses, and the number of extra items the client entered on the pad as been typed into its box, the client clicks on *Score Answer* to move to the next task.

Response Options

Keyboard: Type in the response
        Apple A (Control A on Windows) to check your answer
Mouse: Click on the radio buttons to indicate: Correct (C), Incorrect (I), Omitted (O), Repeated (R)
        Client-entered responses
        Clinician-entered responses (client dictated)
        # of extra items added to the list
Recording Option: Stop (Square), Play (Triangle), Record (Circle)

Options

[Clinician's page]
Prompts - When this option is chosen the computer will write the spoken target words on the line and demonstrate the scratch out when appropriate.
Items per Task - Choose the number of items your client will have to remember (from 1-10).
Recall Delay - Make the task more difficult by asking your client to wait before responding to the stimulus. Set the delay time to 5 or 20 seconds.

[Game page]

Help - Read an overview of the Attention and Memory: Volume II CD, instructions for each game, or an explanation of the *Über Tasks*.

Volume - Set the volume for the game you are in.

Distractors - Choose to have distractors play during the game (On) or not (Off).

Locked - Keep your client from exiting the game before he is finished. If you have chosen to have the *Locked* option on, you can turn it off any time by typing Apple U (Option U on Windows).

Game Results   Level Played, # Stimuli, Client/Clinician Typed Responses, Response Accuracy,
Intrusive Answers, Playing Time, Total Time in Game

Rationale   Improving digit and word span can increase immediate memory. Applying those strategies that helped to increase the memory span to language-based activities will assist with developing functional memory strategies. These strategies can then be used to recall grocery lists and to-do lists, to improve note-taking in the classroom/boardroom, and to participate more effectively in everyday conversations.
Establishing the habits of taking notes and reviewing the accuracy of the notes can be achieved through focused practice.

Alternative   Utilizing the *Clinician's Page*, the tasks can be individualized for type of stimuli, number of items in the task, and recall delay.

Functional Memory
Scanning; Sentences; Paragraphs

Objective The client will attend and utilize auditory and/or visual memory to process, remember, and use information presented at the single word, phrase, sentence, and paragraph levels.

How to Play This program presents the client with a variety of tasks that require the processing of increasingly long and complex pieces of information. Some tasks require the client to read or listen to information presented on the left side of the screen and answer questions that appear on the right side. The clinician can choose to hide or show the text of auditorily presented information by clicking on the *Hide/Show* button (sunflower icon) near the bottom left of the screen. The client can hear the information again by clicking on the *Listen Again* button (sound waves icon). The *Record* button can be used when your client needs additional auditory information, such as his own oral reading of an advertisement. Other tasks require the client to read and/or listen to a word list, then complete a sentence with one of the words from the list, in a multiple choice format. Intervening tasks called *Über tasks* interrupt the client's work, simulating real life. When these interrupting tasks appear, the client simply follows the instructions to complete the *Über task,* then returns to the primary task. Answers to interrupting questions can be verbal or written; this will vary. The answers will not be entered into the computer. The purpose of the intervening tasks is to teach the client to return to a task after being interrupted.

Response Options *Keyboard: Not activated for this program (except the spacebar).*
Mouse: Click on radio buttons or text boxes to complete tasks

Options [Game page]
Help - Read an overview of the Attention and Memory: Volume II CD, instructions for each game, or an explanation of the *Über Tasks*.
Volume - Set the volume for the game you are in.
Distractors - Choose to have distractors play during the game (On) or not (Off).
Locked - Keep your client from exiting the game before he is finished. If you have chosen to have the *Locked* option on, you can turn it off any time by typing Apple U (Option U on Windows).

Game Results Trials Completed, Level Played, Time of Play, Number Correct, Number Incorrect, Total Time in Game

Rationale *Functional Memory* has an auditory and visual focus for each of the three difficulty levels, Scanning; Sentences; Paragraphs. The activities in *Functional Memory* require multiple processing skills in attention, memory and comprehension at the word, sentence and paragraph levels. It requires auditory discrimination of speech, auditory vigilance, auditory memory, auditory comprehension, visual discrimination, and reading comprehension.

Alternative Utilizing the *Clinician's Page*, the tasks can be individualized for type and complexity of stimuli.
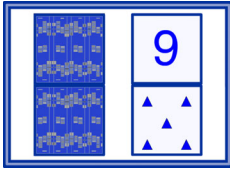
Dominoes

Dots 1-10; Numbers 1-10; Colors; Simple Shapes;
Greek Letters; Addition; Subtraction; Multiplication;
Division

Objective The client will choose the target from a field of 1-5 tiles, select the tile, select the rotation if indicated, rotate the tile, then align matching tiles on the Domino grid.

How to Play **Game Setup**

Choose the Options from the *Options* menu: *Help, Volume, Show Grid, On Correct, Auditory Stimulus, Timer, # of Starting Tiles, Distractors*

Choose the content from the *Content Bar*:
1. *Dots (1-10, tiles matched by number of dots on tiles)*
2. *Numbers (1-10, tiles matched by numeral)*
3. *Colors (10 colors, tiles matched by color)*
4. *Simple Shapes (10 common shapes, tiles matched by shape on tiles)*
5. *Greek Letters -(28 letters, tiles matched by letter on tiles)*
6. *Addition (Sums to 12 ; Addends match to the sum, i.e. 1+1 matches to the tile with the number 2.)*
7. *Subtraction (Differences to 12; Minuend-subtrahend match the difference, i.e. 2-1 matches to the tile with number 1.)*
8. *Multiplication (Products to 144 ; Multiplicand · multiplicand matches the product; 4·4 matches to the tile with number 16.)*
9. *Division (Quotients range 1-12; Dividend ÷ divisor match the quotient, i.e., 8÷2 matches to the tile with number 4.)*

Choose the number of players from the box in the upper left corner of the screen. The "C" stands for 1 player vs. computer. Enter clients' names by high-lighting Player 1, Player 2, etc. and typing the name in the highlighted space.

Game Play

The goal is to be the first player to place all of your tiles onto the game board. **Begin the game by clicking on one of your tiles.** Place one tile per turn within the time limit specified in the *Options* menu.

At least one edge must touch another tile that has already been placed. Each tile contains two sections. When a tile is placed on the board, each section must match or must follow the matching rules as described above.

If none of the tiles can be placed on the game board the player may draw more tiles by clicking on the *Draw Tile* button or pass to the next player by clicking on the *Pass to Next Player* button.

Game Controls ***Draw Tile*** Draw more tiles by clicking the *Draw Tile* button (shows cardbacks on two tiles).

Pass to Next Player End a turn without placing a tile by clicking the *Pass to Next Player* button (the three right facing arrows).

Move After drawing a new tile or rotating a tile, move it by clicking on the *Move* button (the hand). This will require pre-planning and is an excellent divided and shifting attention task.

Rotate Pieces may need to be rotated before being placed on the board. Rotate pieces by clicking the *Rotate* button (the arrows in a circle) to switch into Rotate Mode. Each time a tile is clicked it will rotate one quarter turn in a clockwise direction. The shortcut is to hold down the shift key and click on the mouse. Be sure to click the *Move* button before trying to place the rotated tile.

Options   **HELP** - Find instructions for the *Dominoes* game. Also gain access to an overview of the Attention and Memory II CD and the help screens for all of the programs included on the CD.

Volume - Set the volume for the game.

Show Grid - Choose whether the game board grid is *Visible* or *Hidden*

On Correct - Specify if the game should *Continue* or *Pause* once a tile is correctly placed. When in *Pause* mode, the game waits for a mouse click before passing to the next player's turn.

Auditory Stimulus - Set whether the "click" heard when laying a tile down is audible (*Voice*) or not (*No Voice*).

Timer - Set the amount of time to recognize and place a tile. Choose *30, 60, 90* or *Unlimited* seconds. The *Unlimited* option reduces time pressure anxiety and the time settings can be used to encourage more rapid decision making.

 # Starting Tiles - Set the number of tiles to begin play. Options are 1, 3, or 5 tiles. The default is 5.

Distractors - Decide whether or not you want distracting noise in the background while you are playing the game.

Game Results   Content on the dominoes, Distractors on/off, #Players, Score for each player, #Correct, #Incorrect, %Correct, Total # of moves for each player

Rationale   *Dominoes* was included on the CD to provide both an entertaining reward game and a way to apply the attention and memory skills learned in earlier programs on the CD to a functional task (choose the math facts in levels 6-9.

Über Tasks

Intra-Tasks; Inter-Tasks; User's Lists

Objective   The client will follow the directions for completing each *Über* (oober) *Task* and will then return to and complete the primary task.

How to Use   If you are using the computer-assisted treatment protocol, the *Über Tasks* are pre-programmed, so you don't have to worry about choosing the types of *Übers* or times of presentation. If you would like to have more control over the types of *Übers* presented and how often they appear, click on *Yes, I'd like to pick my own Übers today* when you are asked if you would like to include Übers in your session. The next screen to appear allows you to choose *Intra-Task Übers, Inter-Task Übers,* or *User's Lists (personalized Übers),* stimulus categories, the order of presentation (sequential or random), whether or not the items will repeat, the number of items, and the timing of the tasks (every .5 minute through every 25 minutes, or choose Random timing). As mentioned previously (page 10), the difference between *Intra-* and *Inter-Tasks* is the length of time you will be required to hold on to the information.

All three *Über Task* pages have word list boxes near the top and bottom of the screen. Once you click on the category or categories of *Übers* that you want to use, the stimuli for that category appear in the box on the top (the word bank). Double-click on each desired stimulus or click on the stimulus and then the *Add Stimulus* button. The chosen stimuli then appear in the lower box (the current set). Stimuli can be selected one at a time, a group can be highlighted and moved down, or the entire list can be added to the current set by clicking on the *Add All* button. It is also possible to remove individual stimuli or entire lists using the *Remove Stimulus* and *Remove All* buttons. On the *User's Lists* page, type in the personalized *Über* you want to use, click on the *Add Stimulus* button, then record the phrase using the VCR-like buttons under the text box you typed in.

Now that the *Übers* for this session have been selected, save the set for a specific client using the *Save As* button. When the *Save As* button is clicked, a text box appears asking for a name for the set. If you make changes to this set, the changes can be saved by clicking on the *Save Set* button. Now select a set for another client by removing the stimuli from the lower box, choosing another list of stimuli, adding them to the current set, and saving them as the name of the second client. The new set will automatically become the current set, and *the games will play with the words in the current set*. To change the current set, click on the *Load Set* button to see a list of all saved sets. Click on the name of the desired set, then click *Load*. Loading a set allows you to leave that set, use another set, and come back. It also saves any individualized stimuli, written or verbal, that you have entered for that particular client. Delete sets by clicking on the *Delete Set* button.

Response Options

Verbal
Written (on separate sheet of paper, sticky notes, or calendar)

Options *Intra-Task Übers, Inter-Task Übers, User's Lists (personalized Übers)*

Results Achieving accuracy on the *Übers* is not the primary goal of using them. They are meant to interrupt a task so that the client has to shift attention from one task to the other and back. Clinicians may choose to keep data on % correct and incorrect because it may provide useful information about other areas the client needs to work on. You may practice the *Über-Tasks* by themselves in the same way you might complete workbook tasks. Access *Über-Tasks* for workbook type practice by choosing *Über Workbook* from the main menu.

Rationale The *Über-Tasks* were designed to simulate real-life situations in which you have to hold a task in working memory, shift attention to another task, shift attention back to the original task, and retrieve the information you are holding in working memory. The various tasks tap into recent memory, factual current memory, remote memory, and proscriptive memory, as well as general fund of knowledge.

Change

Levels   Level 1. Training;
Level 2. Filled red and black squares;
Level 3: Numbers 1 and 2;
Level 4: Triangles and circles;
Level 5: Letters x and o;
Level 6: Outlined red and black squares;
Level 7: 2 and moon;
Level 8: b and 3;
Level 9: Simple designs;
Level 10: 2 stimuli-same/different;
Level 11: 4 stimuli-same/different

Objective   The client will sustain and alternate attention to discriminate between two alternating targets. The client will also inhibit impulsive responses to non-targets. Stimuli can be presented auditorily or visually.

Long Term Goal/Functional Goal

Improve auditory or visual attention and active working memory for 8 minutes during a repetitive, low interest activity that requires alternating between targets and ignoring non-targets. Functional applications include being able to pay attention while waiting for your number to be called, noticing when an incorrect price rings up on the cash register or noticing that the teacher has called out a new page number for the class to turn to. Additionally, it strengthens the ability to return to a task after being interrupted and asked to perform a second task.

Short Term Objective:

Sustain attention with a high accuracy rate (>86%) for 5 minutes while alternating attention between targets when a visual or auditory prompt ("change") is inconsistently presented, and alternate between prompts remembering the current target (holding mental set).

California State Standard
  Comprehension

1.1 Understand and follow a one-step oral direction.
1.1 Listen attentively.
1.4 Stay on the topic when speaking.

  Algebra and Functions

1.0 Students sort and classify objects:
1.1 Identify, sort, and classify objects by attribute and identify objects that do not belong to a particular group (e.g., all these balls are green, those are red).

Zydeco

Levels	Auditory/Visual Zydeco; Auditory (High/Low) Zydeco; Functional Zydeco

Objective The client will maintain attention and vigilance in order to remember tones or related words presented in sequence.

Long Term Goal/Functional Goal

Improve auditory and visual attention and associative memory for 15 minutes during an activity that requires sound discrimination, auditory memory, auditory sequencing and replication of the pattern for a gradually increasing span. Functional applications include being able to recall a grocery list that has had items added to it throughout the day or distinguish one phone ring from another.

Short Term Objective Recall five to seven sounds or words with 86% accuracy.

California State Standard
  Comprehension

1.1 Listen attentively.
1.4 Stay on the topic when speaking.

Attention and Memory: Volume II
Quick Reference: Goal Selection

7 ± 2

Levels   Level 1. Numbers;
Level 2. Letters;
Level 3: Colors;
Level 4: Simple Shapes;
Level 5: Greek Letters;
Level 6: Simple designs;
Level 7: Mix all;
Presentation type: Forward; display whole span;
Presentation type: Forward-sequentially;
Presentation type: Forward-centered;
Presentation type: Reversed

Objective   The client will attend and utilize auditory and/or visual memory to recall a span of symbols in sequence, to improve sequential visual and auditory processing.

Long Term Goal/Functional Goal

Improve attention for 10 minutes during a repetitive, low interest activity that requires retrieval of new visual and/or auditory information. This task affords the opportunity to repeat elements before repeating sentences. It also gives the opportunity to correct errors of omission or insertion when given immediate auditory feedback. Visual feedback at the end of the trial concerning correct or incorrect responses provides an opportunity to compare discrepancies and monitor attention to improve or maintain attention. Functional applications include remembering a phone number long enough to find a pen to write it down, remembering your lottery numbers to determine if you are a winner, concentrating and holding on to information while you manipulate the data, as in carrying or borrowing numbers when adding or subtracting.

Short Term Objective

Recall five to seven stimuli forward and three to five stimuli backward with 86% accuracy.

California State Standard
  Comprehension

1.1 Listen attentively.
1.4 Stay on the topic when speaking.

Scaning

Levels   Filled or empty shapes;
Colors; Letters or numbers;
Remember letters or numbers

Objective   The client will maintain attention and vigilance in order to visually scan the screen and select salient information (targets) in a gradually increasing field of complexity (2->50). When the target changes, the client will hold in memory the new target and select it while inhibiting the response to select the previous target.

Long Term Goal/Functional Goal

Improve attention for 8 minutes during a repetitive, low interest activity that requires alternating between targets and ignoring non-targets. Functional applications include recognizing important from unimportant visual and auditory information, controlling impulsive responses, and learning to respond to important information in a reasonable amount of time. When a person has quick, accurate, consistent responses to target stimuli the skill can be generalized to classroom activities such as raising a hand before speaking, waiting to get out of a seat, holding back a verbal retort, or standing patiently in line.

Short Term Objective   Sustain attention with a high accuracy rate (>86%) for 8 minutes while alternating attention between targets when a visual or auditory prompt ("change") is inconsistently presented and alternate between prompts remembering the current target (holding mental set).

California State Standard
  Comprehension

1.1 Understand and follow a one-step oral direction.
1.1 Listen attentively.
1.4 Stay on the topic when speaking.

  Algebra and Functions

1.0 Students sort and classify objects:
1.1 Identify, sort, and classify objects by attribute and identify objects that do not belong to a particular group (e.g., all these balls are green, those are red).

And one more thing...

Levels	Training-Demonstration of note taking skills; Activity 1-Single word dictation; Activity 2-Note taking in conversation; Activity 3-Note taking and revision in conversation

Objective The client will attend to auditory-linguistic information, hold the necessary information in working memory and demonstrate the functional strategies of typing or dictating information. The span of linguistic information will increase from one item to several items within and between categories with addition and deletion of salient items.

Long Term Goal/Functional Goal

Improve auditory attention and simultaneous memory for 5-40 minutes during a novel activity that requires listening carefully for important information, ignoring unimportant information and writing down notes in order to recall the information later. This task reinforces the concept that words are meaningful and they connect ideas to events, actions, things, and ideas. In doing so they relate events to personal experiences. This task provides an opportunity to hear and practice re-telling simple and complex auditory messages like grocery lists or phone messages. It also provides an opportunity to practice gleaning the main ideas from class lectures. Another skill targeted by this task is the ability to change mental set; to revise information and to remember that new information.

Short Term Objective

Sustain attention for linguistically complex and relevant information, recognize salient information, and indicate important elements through written or oral language means for self-correction and self-monitoring of the communicated message.

California State Standard
Comprehension

1.1 Listen attentively.
1.4 Stay on the topic when speaking.

Functional Memory

Levels   Scanning
            Sentences
            Paragraphs

Objective   The client will attend to the information presented and utilize auditory and/or visual memory to process, remember, and use information presented at the single word, phrase, sentence, and paragraph levels.

Long Term Goal/Functional Goal

Improve dual processing tasks of memory and comprehension for sentence and paragraph level material. This task requires reading or listening to the stimuli, processing the language concepts as a whole while recalling specific details, then demonstrating comprehension by responding to multiple choice or open-ended questions. The higher level comprehension skills of getting the main idea, inferring, predicting outcome, concluding consequences and evaluating the relevance of the material allow practice opportunities for improving reading comprehension and oral or written expressive language skills.

Short Term Objective Sustain attention and comprehend sentence/paragraph level oral/written material in order to respond through verbal/written means to the following: main idea, conclusion, inference, and/or prediction.

California State Standard
  (General, not grade specific)
  Comprehension
            1.1   Listen attentively.
            1.4   Stay on the topic when speaking.
            2.2   Ask questions and support answers by connecting prior knowledge with literal information found in, and inferred from, the text.
            2.3   Demonstrate comprehension by identifying answers in the text.
            2.4   Recall major points in the text and make and modify predictions about forthcoming information.
            2.5   Distinguish the main idea and supporting details in expository text.
            2.6   Extract appropriate and significant information from the text, including problems and solutions.
            2.7   Follow simple multiple-step written instructions (e.g., how to assemble a product or play a board game).

            1.0   Listening and Speaking Strategies
                    Students deliver focused, coherent presentations that convey ideas clearly and relate to the background and interests of the audience. They evaluate the content of oral communication.

Functional Memory, Continued

Comprehension and Analysis of Grade-Level-Appropriate Text

2.2 Use appropriate strategies when reading for different purposes (e.g., full comprehension, location of information, personal enjoyment).

2..3 Make and confirm predictions about text by using prior knowledge and ideas presented in the text itself, including illustrations, titles, topic sentences, important words, and foreshadowing clues.

2.4 Evaluate new information and hypotheses by testing them against known information and ideas.

2.5 Compare and contrast information on the same topic after reading several passages or articles.

2.6 Distinguish between cause and effect and between fact and opinion in expository text.

2.7 Follow multiple-step instructions in a basic technical manual (e.g., how to use computer commands or video games).

Listening and Speaking Strategies

1.0 Students listen critically and respond appropriately to oral communication. Theyspeak in a manner that guides the listener to understand important ideas by using proper phrasing, pitch, and modulation.

Comprehension

1.1 Ask thoughtful questions and respond to relevant questions with appropriate elaboration in oral settings.

1.2 Summarize major ideas and supporting evidence presented in spoken messages and formal presentations.

1.3 Identify how language usages (e.g., sayings, expressions) reflect regions and cultures.

1.4 Give precise directions and instructions.

Organization and Delivery of Oral Communication

1.5 Present effective introductions and conclusions that guide and inform the listener's understanding of important ideas and evidence.

1.6 Use traditional structures for conveying information (e.g., cause and effect, similarity and difference, and posing and answering a question).

1.7 Emphasize points in ways that help the listener or viewer to follow important ideas and concepts.

1.8 Use details, examples, anecdotes, or experiences to explain or clarify information.

1.9 Use volume, pitch, phrasing, pace, modulation, and gestures appropriately to enhance meaning.

Attention and Memory: Volume II
Quick Reference: Goal Selection

Dominoes

Levels   Dots 1-10, Numbers 1-10, Colors, Simple Shapes, Greek letters, Addition, Subtraction, Multiplication, Division

Objective   The client will choose the target from a field of 1-5 tiles, select the tile, select the rotation if indicated, rotate the tile, then align matching tiles on the Domino grid.

Long Term Goal/Functional Goal

Improve associative and factual memory retrieval skills for counting, shapes, addition, subtraction and multiplication. Functional applications include learning to carry out a complex task with several steps (see Objective above), decreasing impulsivity by waiting for the computer to take its turn, improving the ability to divide attention between two competing tasks, and improving mental math calculation for everyday use.

Short Term Objective   Sustain attention and utilize working memory to encode object or numeric information and demonstrate accurate retrieval of information by using a visual matching task.
Auditory, visual and planning strategies will be employed for efficient accurate retrieval.

California State Standard   (General, not grade specific)
   Algebra and Functions

1.0 Students sort and classify objects:
1.1 Identify, sort, and classify objects by attribute and identify objects that do not belong to a particular group (e.g., all these balls are green, those are red).
2.0 Students estimate, calculate, and solve problems involving addition and subtraction of two- and three-digit numbers.
2.1 Understand and use the inverse relationship between addition and subtraction (e.g., an opposite number sentence for 8 + 6 = 14 is 14- 6 = 8) to solve problems and check solutions.
2.2 Find the sum or difference of two whole numbers up to three digits long.
2.3 Use mental arithmetic to find the sum or difference of two two-digit numbers.
3.0 Students model and solve simple problems involving multiplication and division.
3.1 Use repeated addition, arrays, and counting by multiples to do multiplication.
3.2 Use repeated subtraction, equal sharing, and forming equal groups with remainders to do division.
3.3 Know the multiplication tables of 2s, 5s, and 10s (to times 10) and commit them to memory.
2.0 Students calculate and solve problems involving addition, subtraction, multiplication, and division.

Attention and Memory: Volume II
Quick Reference: Goal Selection

Über Tasks

Levels	Scanning; Sentences; Paragraphs

Objective The client will attend and utilize auditory and/or visual memory to process, remember, and use information presented at the single word, phrase, sentence, and paragraph levels.

Long Term Goal/Functional Goal

Improve associative and factual memory retrieval skills for information that has been stored in both long term memory and short term memory. This task requires episodic memory (events learned or experienced), procedural memory (steps for a motor sequence), automatic memory (facts you don't have to think about), associative memory (information stored together), factual memory (dates, facts, general knowledge), interpretive memory (inferences and conclusions), recognition memory (have seen info. before), categorical memory (classified groups), and/or sequential memory (in order). Functional applications include being able to tell about events that happened yesterday or 20 years ago, remembering how to bake a cake, recalling the date of the landing on the moon, remembering your personal information, and knowing what sequence is necessary for going to the grocery store.

Short Term Objective Sustain attention and utilize working memory to encode and retrieve auditory/visual information and demonstrate retrieval of information through writing and speaking.

California State Standard
  Comprehension

  1.1 Listen attentively.
  1.4 Stay on the topic when speaking.
  2.2 Ask questions and support answers by connecting prior knowledge with literal information found in, and inferred from, the text.
  2.3 Demonstrate comprehension by identifying answers in the text.
  2.4 Recall major points in the text and make and modify predictions about forthcoming information.

  Listening and Speaking Strategies

  1.0 Students deliver focused, coherent presentations that convey ideas clearly and relate to the background and interests of the audience. They evaluate the content of oral communication.

Read Me First!

Windows® Installation

Windows 98/ME and Windows 2000/XP®

Put the CD in the computer. Double-click on "My Computer". A window will open with several drives displayed. Double-click on the CD drive. Double-click on "SETUP". Follow the instructions.

When the installation program is finished you will have installed a pointer to the CD onto your hard disk. To run the programs on the CD you will need to click on the "Start" button. Then click on "Programs", then the "LocuTour" Shortcut folder, then "A&M II". You may also start the game by clicking on the "A&M II" shortcut on the desktop.

The program will run on some versions of Windows NT, but sound recording is not available.

Macintosh® Installation

Put the CD in the computer. Open the CD and double-click the game icon to begin.
You can also put the game on your hard drive. Drag the game folder to your desktop or a folder on your hard disk.

A detailed manual is included on the CD in Adobe Acrobat® format. Charts for tracking are located in the "Progress Charts" folder on the CD. If you have Acrobat installed, double clicking on the manual or chart will open it. If you do not have Acrobat installed, a copy of the installer is included on the CD.

Macintosh® System Requirements

The Macintosh version requires an Apple Macintosh with a Power PC chip (G3 recommended), 32-64 megabytes of available RAM, System 7 or OS8/9, a CD-ROM drive, and color monitor. You can play the games from the CD or drag the icons to a folder on the Hard Disk.

Windows® System Requirements

The Windows version requires Windows 98/ME or Windows 2000/XP, a Pentium chip (P3 recommended), 32-64 megabytes of available RAM, a CD-ROM drive, a multimedia sound card and video card, and a color monitor.

Complete Manual

A manual that provides a rationale for each game and alternatives for therapy is included on this CD. It is located in the Manuals folder and is formatted in Adobe Acrobat® format. If you do not already have Acrobat installed, a copy is included on the CD.

LocuTour Multimedia, Inc. End-User License Agreement

This agreement allows you to:
(a) Use the LocuTour software on a single computer at any one time.
(b) Print copies of the complete manual from the CD and distribute those copies: (i) for use by personnel employed by you; (ii) for use by your therapy clients; (iii) for use by other third parties, provided the copies are distributed free of direct or indirect charges.

For information on other products and a free demo CD, check out our web site at www.LocuTour.com or e-mail us at info@LocuTour.com.

Attention and Memory: Volume II
Stock Number: N13-3

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