

Introduction

Human memory is multidimensional and comprises several interrelated systems (Mahendra & Apple 2007). The memory types targeted in the exercises in this manual are often used to rehabilitate individuals with brain injuries.

The exercises are divided into four specific areas and are coded by card suits. A long-term objective(s) is suggested for each area:

- ♥ **short-term memory:** The client will recall five to nine units of auditory information with or without compensatory strategies to maximize success with activities of daily living.
The client will recall up to four units of visual information with or without compensatory strategies to maximize success with activities of daily living.
- ♠ **declarative long-term memory:** The client will retrieve stored information by recall or recognition to maximize success with activities of daily living.
- ♦ **procedural long-term memory:** The client will retain knowledge of how to perform learned motor routines with repetition to maximize success with activities of daily living.
- ♣ **prospective long-term memory:** The client will independently recall visual and/or auditory information of an event or activity with or without prompts to maximize success with activities of daily living.

Using a deck of playing cards, each exercise targets one or more of these areas through auditory and/or visual modalities. (See the matrix listing of exercises by memory type on pages 1-2. The exercises are in alphabetical order.) In addition, all of the exercises incorporate working memory – a pervasive cognitive skill.

Working memory has no time limitations, but its capacity is limited by the number of tasks that can be processed over any given timeframe (Montgomery & Windsor 2007). Working memory requires active processing and is influenced by sustained attention (Schneider 2007). If you have clients with impaired attentional processes, you may want to address those deficits first. (See CARDS: *Attention*, Kaiser et al., LinguSystems, Inc., 2008.)

Daily living activities like the following require working memory:

- Recalling the phone options to make the appropriate selection when listening to a prerecorded voice message
- Reading comprehension
- Playing cards or board games

Short-term memory, or immediate memory, is a temporary storage space for information that frequently requires further processing (Brookshire 1997). Tompkins (1995) reports, “Short-term memory capacity is limited and decays rapidly unless refreshed through control processes, including rehearsal, elaboration, organization, or decision.”

Daily living activities like the following require short-term memory:

- Recalling directions to a new location
- Recalling a dictated phone number
- Recalling a list of grocery items

Long-term memory is a permanent storage of knowledge and experiences over time, ranging from minutes to years and requiring continuous reorganization (Halper, Cherney, & Miller 1991). As new information is received, it is comprehended and encoded into long-term memory by linking it to permanently stored, long-term knowledge. Over time, information is imbedded deeper into cortical tissue for permanent storage. Long-term memory is a complex system that is “essentially limitless in size” (Tompkins 1995).

One aspect of long-term memory is **declarative memory**, which involves the acquisition of facts (Squire 1992 as cited in Baddeley, Wilson, & Watts 1995).

Daily living activities like the following require declarative long-term memory:

- Recalling autobiographical information
- Recalling people, places, and events from a family vacation
- Recalling 911 in an emergency

Procedural memory, another aspect of long-term memory, is concerned primarily with motor skills (Matlin 1988). There is an automatic component in procedural memory tasks that allows for improvement through repetition (Halper, Cherney, & Miller 1991; Fabiani, Low, Wee, Sable, & Gratton 2006).

Daily living activities like the following require procedural memory:

- Performing a morning routine in the same sequence
- Driving
- Locking the door when leaving home

Prospective memory is an aspect of long-term memory that not only requires an individual to remember to do something in the future, but to remember to do it at the correct time (remember to remember). In their 1987 study, Mateer, Sohlberg, and Crinean (as cited by Hartley 1995) reported that individuals with brain injuries frequently have difficulty with prospective memory tasks.

Factors influencing prospective memory are the type of task and the timeframe. Memory failure is more common in demanding or interesting ongoing tasks and in tasks in which 10 seconds have elapsed between the reminder and the target time (Harris & Wilkins 1982).

Daily living activities like the following require time-based, prospective memory:

- Making an unscheduled phone call prior to the end of a business day
- Giving a family pet its medication every 30 days

Daily living activities like the following require event-based, prospective memory:

- Taking prescribed medications when a preset alarm sounds
- Getting off at the appropriate bus stop when using public transportation

Daily living activities like the following require activity-based, prospective memory:

- Picking up the dry cleaning after work
- Turning off the stove after cooking

The memory exercises in this manual are intended to enhance direct intervention for improving memory. There is a wide range of difficulty presented in these exercises. Adapt any exercise as needed for your client's level of functioning (e.g., allow prompts, reduce the memory load of more difficult tasks, provide mnemonics and repetition). A data collection form is provided on the next page for your use in tracking progress.

We hope that you will find these exercises both effective and easy to use in any setting.

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