Rehabilitation of everyday cognitive deficits, with particular emphasis on memory,

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A quick word about rehabilitation

- Rehabilitation is NOT synonymous with recovery (i.e getting back to what one was like before the injury or illness)
- Rehabilitation is NOT synonymous with treatment (treatment is something we do to people or give to people)
- Rehabilitation IS a two way interactive process

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Cognitive Rehabilitation

Rehabilitation is a process whereby people with brain injury work together with professional staff and others to remediate or alleviate cognitive deficits arising from a neurological insult

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Neuropsychological Rehabilitation

- Neuropsychological rehabilitation is similar to cognitive rehabilitation but broader.
- It is concerned with the amelioration of cognitive, emotional, psychosocial and behavioural deficits caused by an insult to the brain

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The main purposes of such rehabilitation

is to enable people with disabilities to achieve their optimum level of well being, to reduce the impact of their problems on everyday life and to help them return to their own most appropriate environments

is <u>not</u> to teach them to score better on tests or to learn lists of words or to be faster at detecting stimuli

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Rehabilitation should target real life problems

- As far as possible one needs to address the real life difficulties experienced by people with brain injuries
- Unless one is asking a particular question which cannot be answered in this way
- The results however should then be applicable to real life problems

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Important messages for rehabilitation

- In broad terms, it is important that any intervention consider the following:
- Is the intervention sufficiently engaging and reinforcing?
- Does the client understand the relevance of this intervention to everyday behaviours?
- Is the intervention sufficiently challenging as to encourage new learning?
- Is the intervention occurring at sufficient intensity and frequency to promote change?

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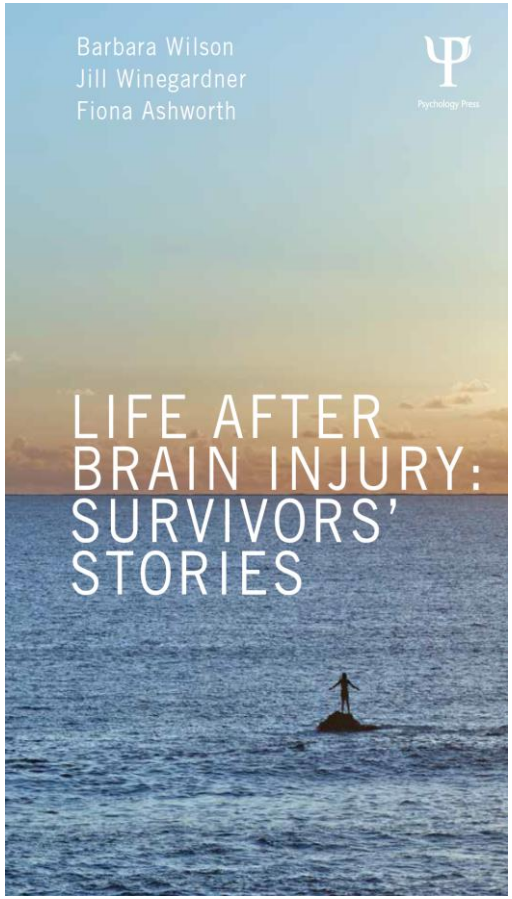
Life After Brain Injury: Survivors' Stories



By Barbara A Wilson, Jill Winegardner and Fiona Ashworth

Psychology Press 2014

17 survivors write their stories (each chapter written partly by the survivor and partly by a neuropsychologist)

You can read what the patients think of rehabilitation

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Rehabilitation Should:-

- Focus on goals relevant to patient's own everyday life
- Be implemented in the setting where the patient lives (or generalise to this setting)
- Be collaborative
- Try to reduce disability and improve real life functioning

Current Rehabilitation

- Partnership with patients and families
- Goal setting to plan rehabilitation
- Recognition that cognition, emotion and behaviour are interlinked (holistic approach)
- Increasing use of technology
- Need a broad theoretical base (no one model or approach is sufficient)

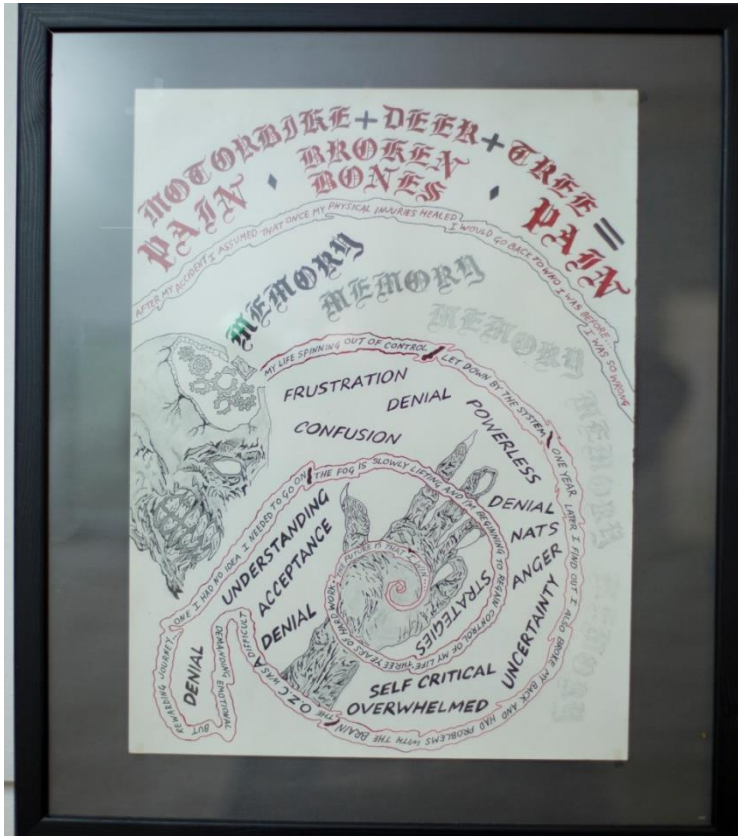
Partnership with patients and families

- Doctors, psychologists and therapists used to decide what patients should achieve/work on/aim for in rehabilitation
- For example “Fred will work on wheelchair independence” or “Mary will learn a alternative communication system”
- Now we negotiate goals

Rehabilitation is Goal-Oriented

First goal for all clients at the Oliver Zangwill Centre is Understanding Brain Injury: UBI

Understanding the cognitive, functional, communication and mood consequences of the injury



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Rehabilitation is focused on the achievement of meaningful and functionally relevant goals

A goal is the what the patient wants to achieve as a result of rehabilitation (Wade 1999)

Cognitive Goals

- Learning to use the telephone again

Emotional Goals
Reducing Fear: Caroline will

Travel alone by train from Ely to Cambridge (17 min journey)

First ST goal Caroline will learn relaxation techniques

Second ST goal Caroline will travel one bus stop with her therapist sitting beside her

Etc

A social goal: Victor will

Attend the bowls club in his home town three times a month

First ST goal Victor will check by phone whether his membership has lapsed

ETC

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Some goals to work on at home

- Kate – I want carers to treat me as a person and not a body
- Sonia –I want to be able to cook a meal for my friends
- Martin – I need to understand what has happened to me
- Peter – I want to look after my children while my wife works

etc

The Holistic Approach Pioneered by Yehuda Ben-Yishay and George Prigatano

- Regards it as futile to separate the cognitive consequences of brain injury from the emotional, social and functional consequences.
- How we feel affects how we think, remember, communicate, solve problems and behave
- So these functions are inter connected, hard to separate and all need to be dealt with in rehabilitation

All Holistic programmes

Offer both group and individual therapy:

- To increase awareness
- Promote acceptance and understanding
- Provide cognitive remediation
- Develop compensatory skills
- Provide vocational counselling
- Dedicated and innovative staff can do this without extra resources

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Core components of holistic rehabilitation

- Working with families
- Shared understanding
- Therapeutic milieu
- Learning strategies and developing skills
- Meaningful functional activity
- Psychological therapies

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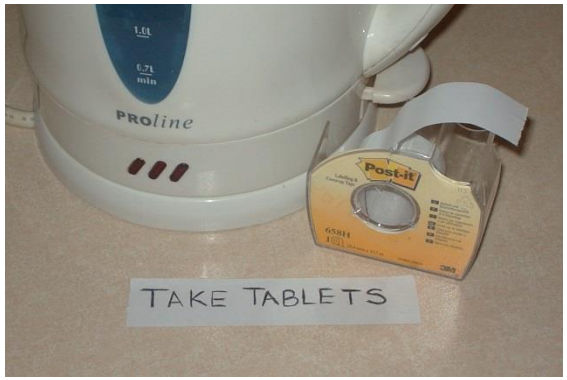
Van Heughten, Wolters & Wade (2012)

- 95 RCTs were included from January 1980 until August 2010 studying 4068 patients in total
- there is a large body of evidence to support the efficacy of cognitive rehabilitation

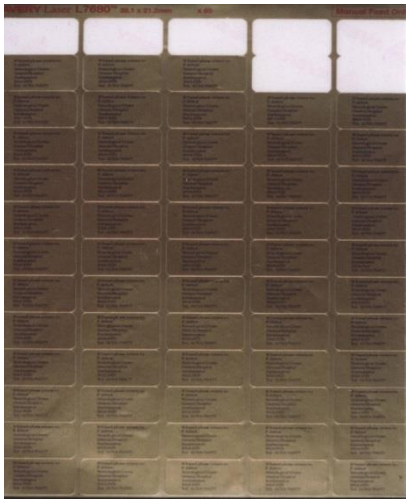
Increasing Use of Technology

- This does not have to be “High-Tec”

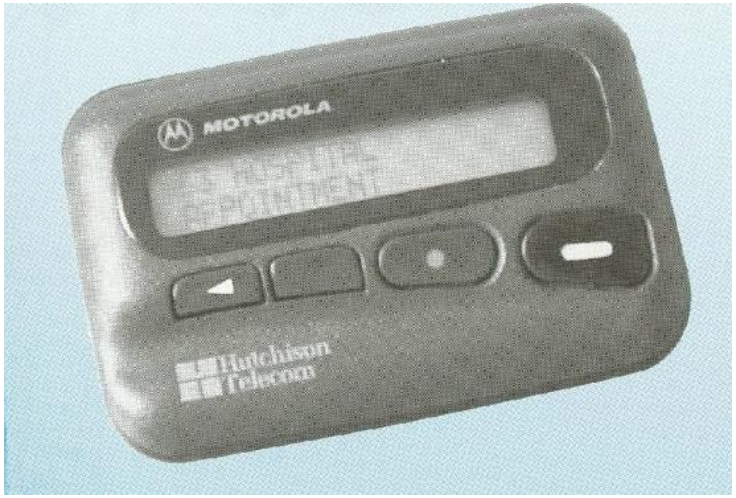


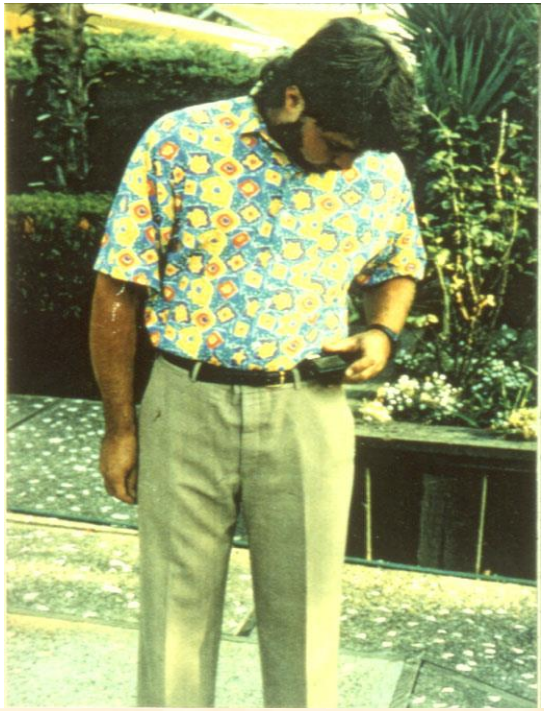
Post-it tape can also be used for writing instructions

on how to use equipment at home



When things get mislaid….
Self-adhesive labels - ‘if found, please contact..’
If you can lose it - label it

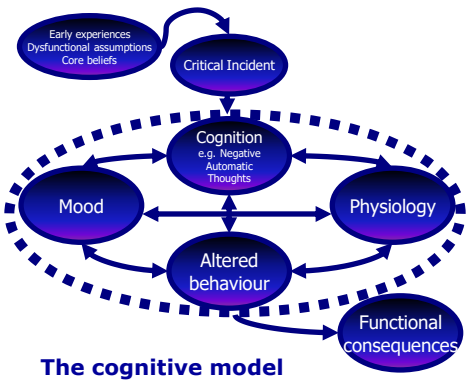




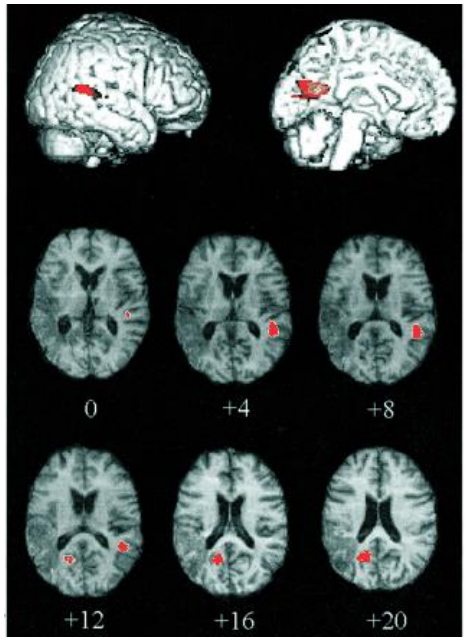
A subject using the NeuroPage receiver

Need to refer to several models and theories

- Cognitive Functioning
- Learning
- Emotion
- Assessment
- Recovery
- Plasticity
- Compensation
- Linguistics etc



The cognitive model of depression



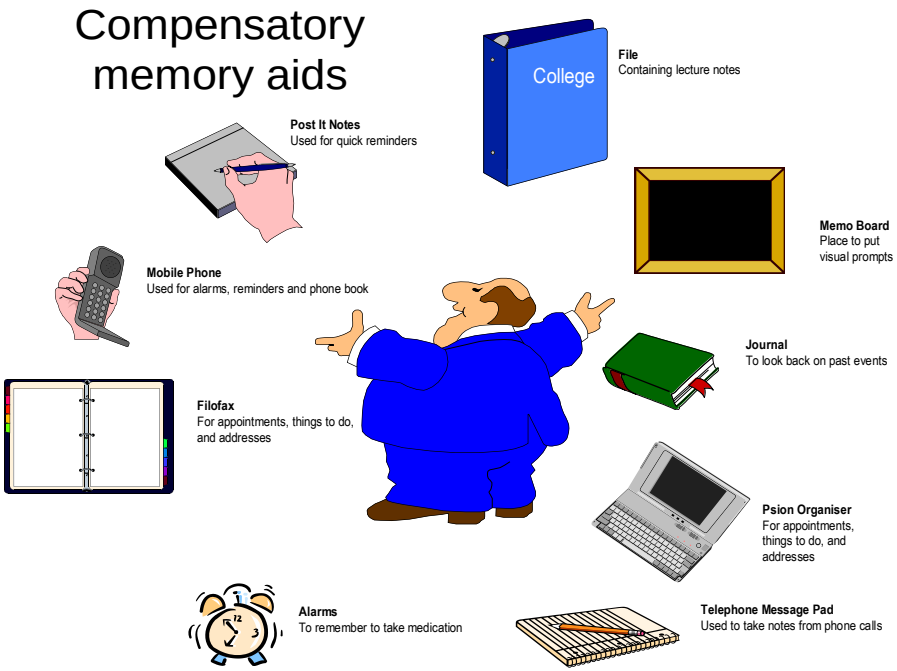
Need a broad theoretical base

- Survivors of brain injury are likely to have
- Several cognitive problems e.g. with attention, memory, executive functions, word finding etc. and
- Additional non-cognitive problems e.g. anxiety, depression, social skills deficits etc.

- So it is unlikely that one model, theory or framework can address all these difficulties
- Being constrained by one theoretical model can lead to poor clinical practice.

MEMORY

The ability to take in, store and retrieve information



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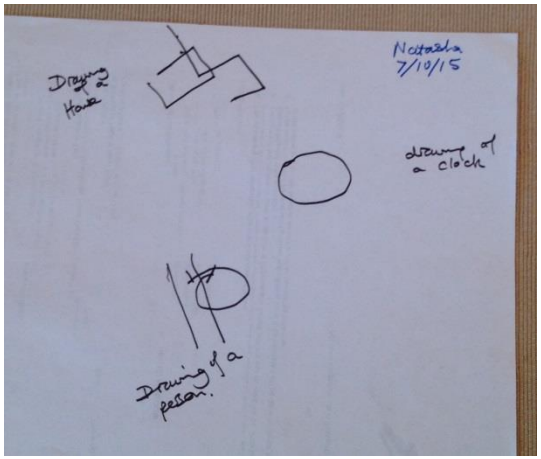
Three main types of strategies to help people manage in everyday

- Help people to learn more efficiently
- Help them to compensate for their difficulties
- Adjust the physical and verbal environment to avoid the need for memory



Helping people to learn more efficiently

- Repetition (widely used, not sufficient by itself)
- Spaced retrieval (expanded rehearsal)
- Errorless learning (avoid trial-and-error learning)
- Vanishing Cues

Spaced retrieval (expanded rehearsal)

- Present the material to be remembered (e.g. a new telephone number, name or short address)
- Test immediately
- Test again after a short delay a second or two
- Gradually build up the retention interval

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The Raphael Medical Centre

Does it work?

- Used with people with dementia (eg Camp and others)
- Also with people with non-progressive conditions (Sohlberg et al 2005 and others)
- Hopper et al (2005) looked at 15 studies and recommends SR for people with dementia

Why does it work?

- Probably because distributed practice is better than massed practice
- Seems to work even better when combined with errorless learning

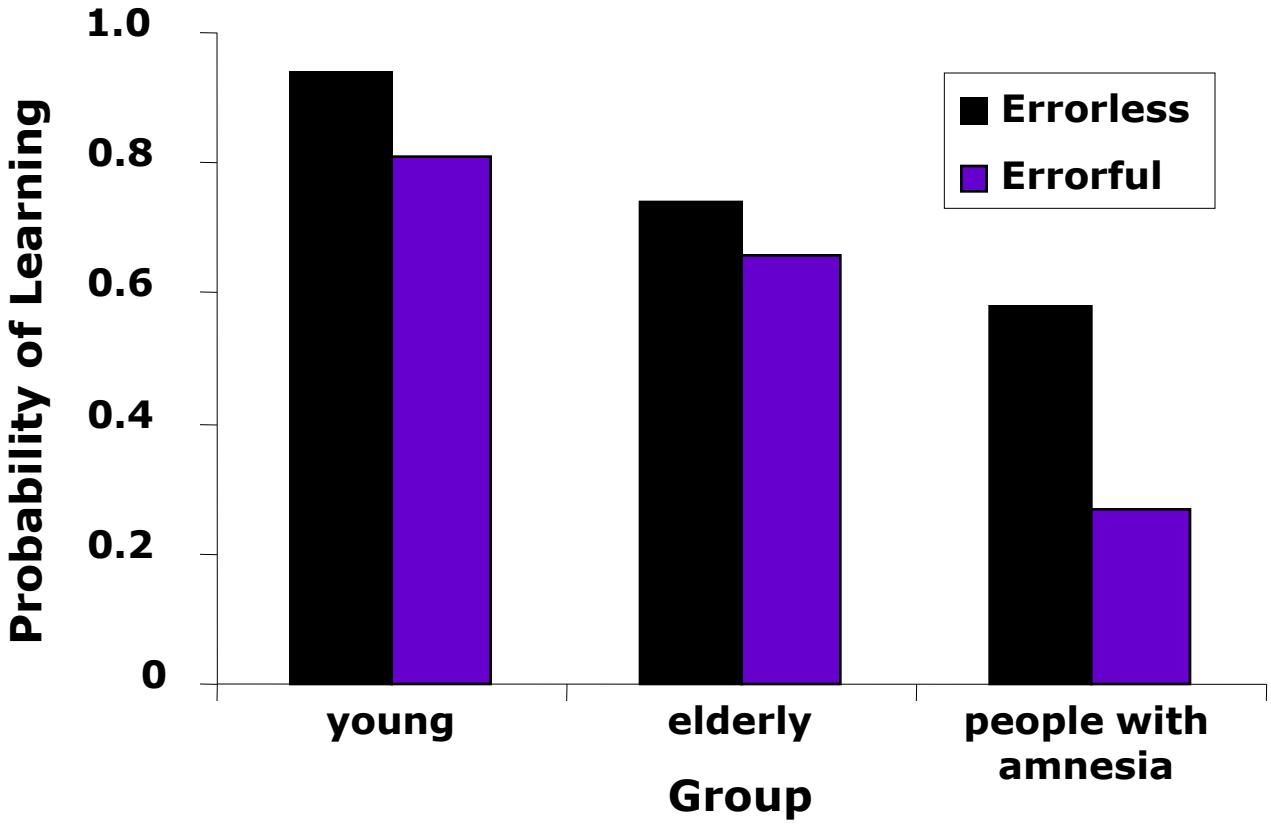
Errorless learning

- EL is a teaching technique whereby people are prevented, as far as possible, from making mistakes while they are learning a new skill or acquiring new information.
- This can be carried out in a number of ways
- EG providing spoken or written instructions or guiding the person through a task.
- The principle is to avoid mistakes being made during learning and to minimise the possibility of erroneous responses.

Errorless learning: two theoretical backgrounds

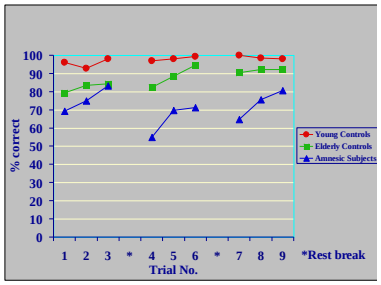
- Errorless discrimination from behavioural psychology (Terrace 1963, 1966; taken up in the field of developmental learning disability)
- Implicit learning from cognitive psychology (Brooks & Baddeley 1976, Graf & Schacter 1985 etc)

P (Learning) by group



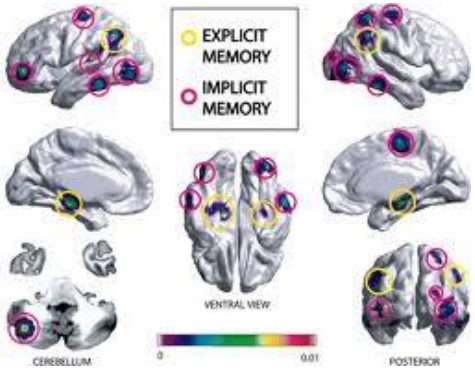
Clinical applications: Studies from 1994 to 2017

- used errorless learning to teach several everyday tasks to
- people from different diagnostic groups and
- of different ages and
- at different times post insult
- errorless learning superior to trial-error learning for people with severe memory problems



Why does it work?

- In order to benefit from our mistakes we need to be able to remember them
- If EL depends on implicit memory, this system is not good at error elimination (episodic memory does that)
- So if people who only have implicit memory functioning make an incorrect response, this response may be strengthened
- We know from several studies that prior errors cause more interference for those more reliant on implicit memory



Vanishing Cues

- a method whereby prompts are provided and then gradually faded out.
- Caroline
- Carolin-
- Caroli--
- Carol--- etc

First reported by Glisky et al(1986) and number of studies since then reported some success

Elizabeth Glisky

WHY DOES IT WORK?

- Probably because it is an errorless learning (or at least an error reduction) approach

Location Detection Device

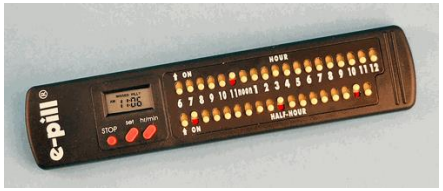
Device

Day Clocks

Voice-Alarm Reminder

Talking Watch

e-pill Multi Alarm



Vibration repeated cueing device that may be useful for those with combined hearing and visual handicaps.

AUTOMATED IN-CAR VOICE REMINDER

Plugs into cigarette lighter socket

Automatically plays message when car is started

Pill Box Reminder

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Day Clocks

Two versions –

Day Version

Day & Time Version

£27

www.dayclocks.co.uk

External Aids to Compensate for PM problems

- External memory aids are now widely available, can be very inexpensive, and have the potential to be highly effective in the compensation for PM problems.
- There can be difficulty in both learning, and remembering, to use electronic reminders, but even in densely amnesic patients, electronic devices can sometimes be used to aid PM.

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External Memory Aids: Can be a real aid to independence but

People with memory problems

- Forget to use them
- May have difficulty programming them
- May use them in an unsystematic or disorganised way
- May be embarrassed by them

- The people who need memory aids the most have the greatest difficulty in using them.
- Use of a memory aid involves memory.

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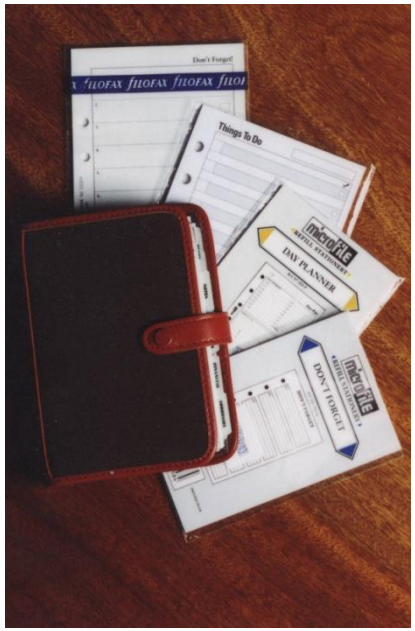
- Some memory impaired people use compensatory aids and strategies efficiently.
- Kime, Lamb & Wilson, 1996) described the use of a cueing device (an hourly watch alarm) to prompt a densely amnesic young woman to check her diary.
- Diary checking increased over the course of the programme
- This was maintained at follow-up more than a year later
- Believed the young woman was using her implicit memory



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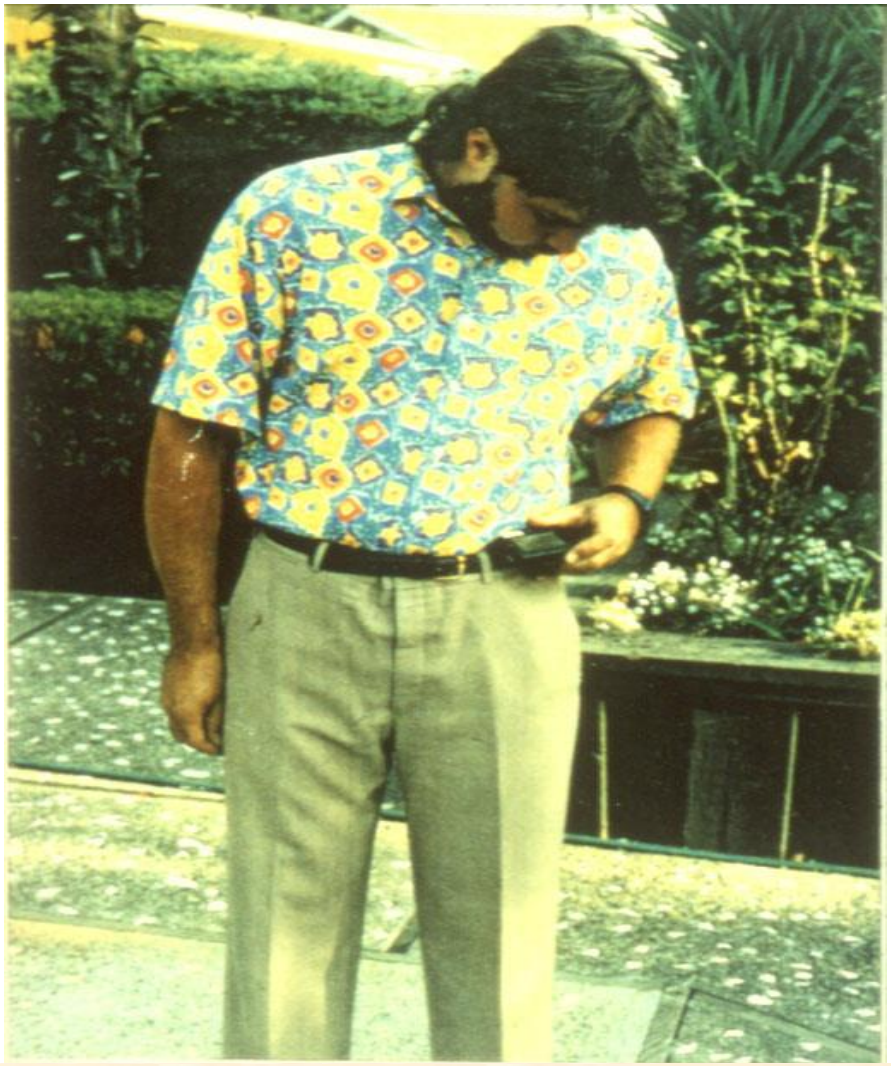
Why do some M.I. people use compensations efficiently and others fail to use them at all?

Age, severity, widespread cognitive problems, premorbid use of aids may play a part (Wilson and Watson 1996, Evans et al 2002)

NEUROPAGE



A subject using the NeuroPage receiver

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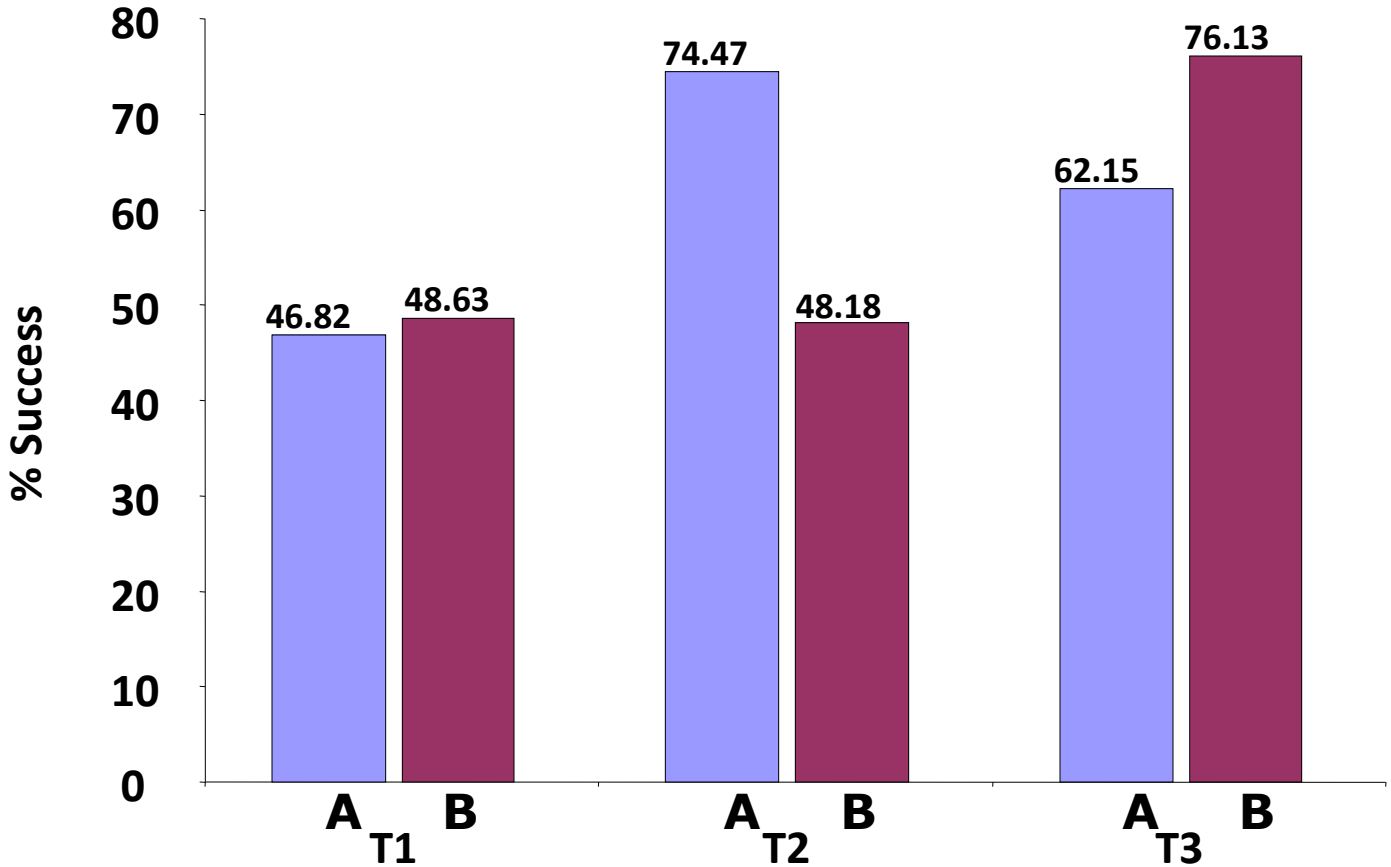
Percentage success rate for participants in Group A (pager first) and Group B (pager later) at Time 1 (baseline); Time 2 (weeks 8 and 9) and Time 3 (weeks 15 and 16)



Other electronic devices include

- Television Assisted Prompting (TAP) Device
- Mobile phones
- Smart phones
- Google calendar
- SenseCam/Autographer/ Narrative Clip
- etc

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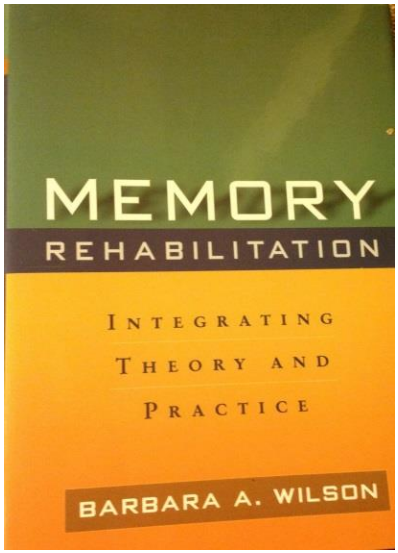
Plenty of Evidence For The Success of Compensations



- NeuroPage
- SenseCam
- Google Calendar
- Mobile and Smart phones
- Television Assisted Prompting (TAP) Device
- Etc

Jamieson et al 2013: Systematic Review of External Memory Aids (significant and large effects)

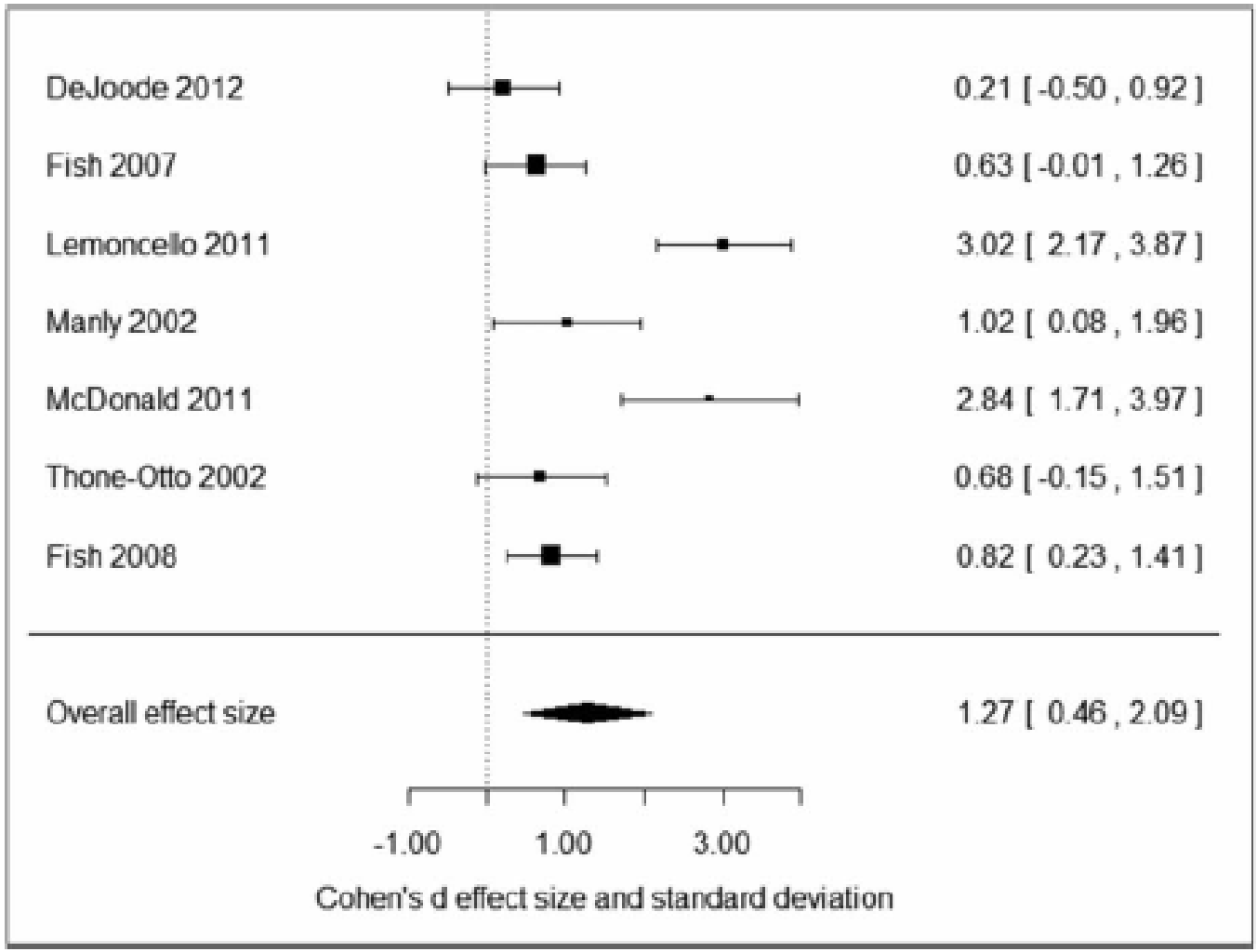


Figure 2. Meta-analysis results with effect sizes, confidence intervals and weightings for each individual study.

Organising the Environment: Avoiding the need for a memory

- For people with severe and widespread problems
- Smart Houses
- Signposts and Labelling
- Verbal Environment may be altered too

Photo phone
Automatically dials number of person when the button is pressed

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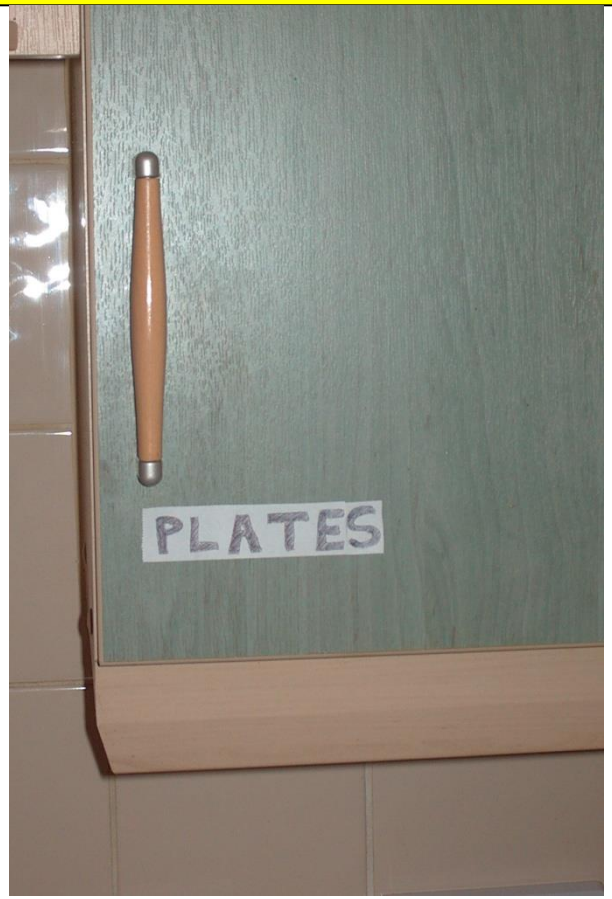
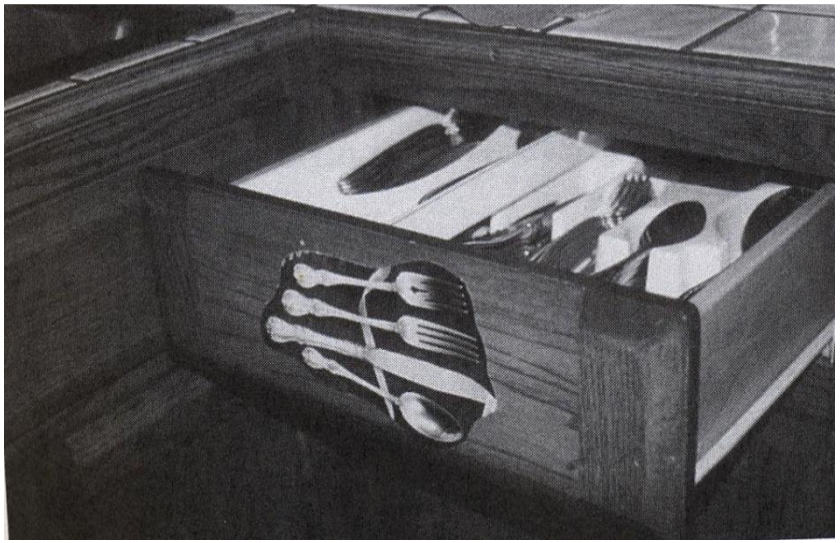
Labels or pictures for cupboards or drawers





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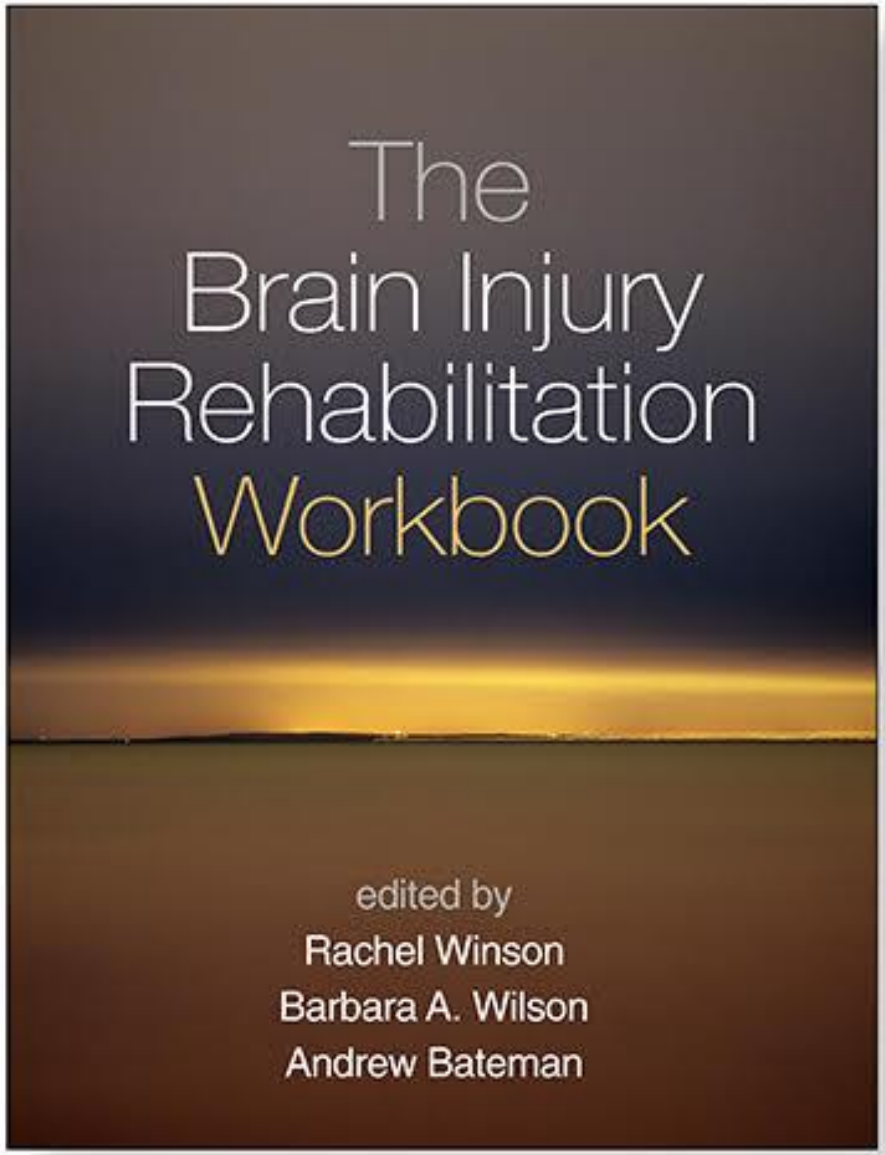

Guilford Press: New York 2017

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First steps in planning a memory programme

- Background information (diagnosis etc)
- Clinical interview with patient/client and family
- Cognitive assessment
- Emotional assessment
- Functional assessment
- Team input
- Formulation

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Formulation

- The process of deriving hypotheses concerning the nature, causes and factors influencing current problems or a client's current situation.
- Considers all the possible influences on an individual's level of functioning and his or her psychological state
- Helps clinician, clinical team and the client to understand the problems.

In rehabilitation

Formulation requires reference to many different models to cover the biological, psychological and social domains

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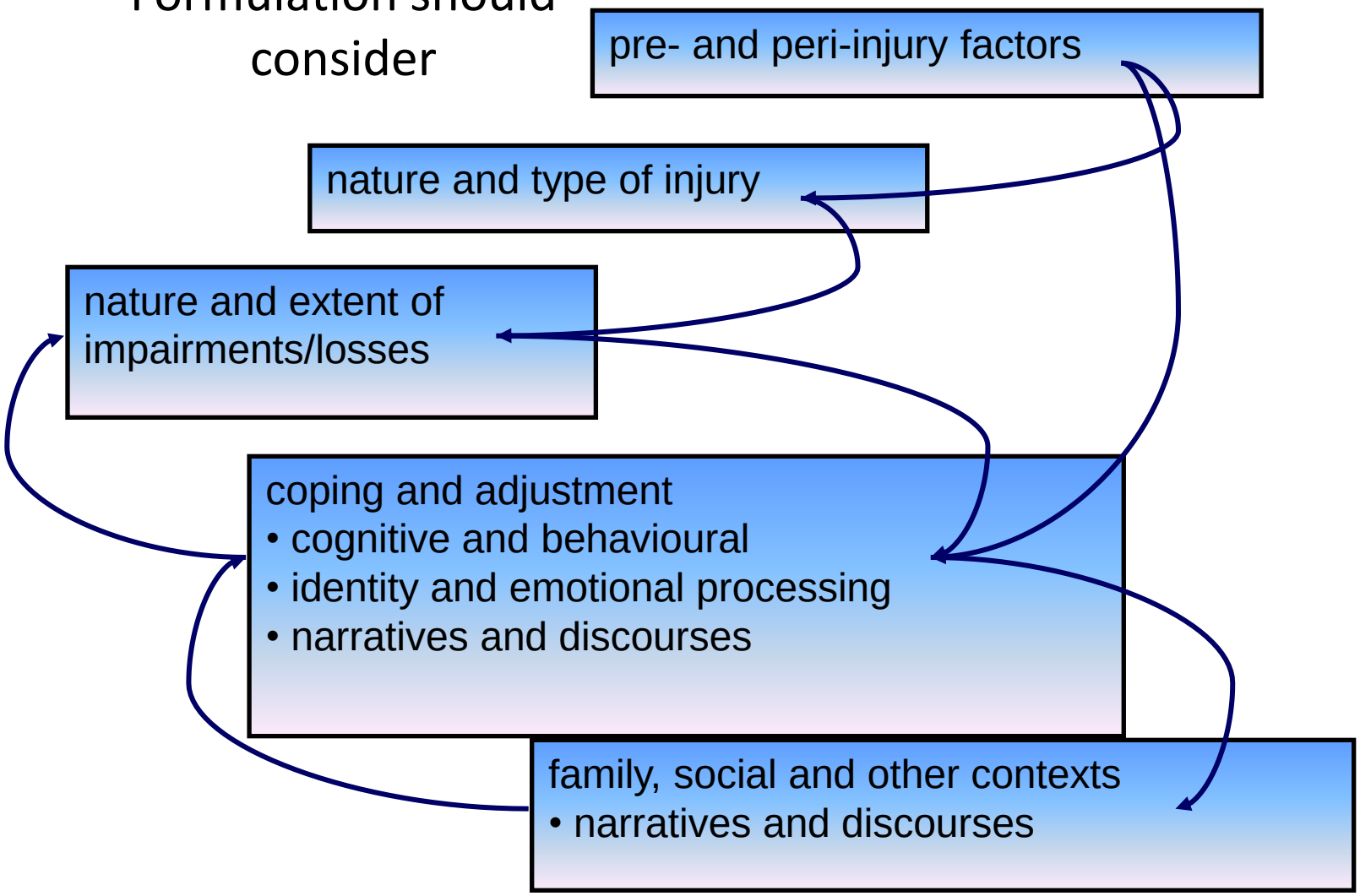
Formulation should consider



Goal setting

- Negotiation with patient, family member(s), staff team, other support workers
- Goals need to be meaningful and relevant
- And follow SMART principles

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Selecting the best strategies to achieve the goals

- If people need to learn new information then the errorless learning, spaced retrieval and vanishing cues techniques can be considered together with mnemonics and rehearsal strategies.

Other examples

- For learning people's names, errorless learning combined with visual mnemonics, vanishing cues and spaced retrieval may be the method of choice.

Or….

- If the goal is to learn a new computer programme (or how to use a computer in the first place) then errorless learning, spaced retrieval and vanishing cues have all proved to be useful.

- For improving studying skills, the PQRST technique may be of benefit.
- Remembering to do things will probably require memory aids
- My “star” patient was able to live independently through good use of external memory aids

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Emotional consequences of memory impairment

- If the patient has emotional problems consider CBT and psychological support groups

Shortage of funding: one solution is Support Worker Training

Case Example: EO

67-year-old married man
Encephalitis
Profound memory impairment
Severe emotional distress and emotion dysregulation

• both of these diminished during his participation in our intensive rehabilitation programme….

• but returned after he went back home and no longer had structured meaningful activities.

Support worker training

• Because no funds were available for support workers, the OZC team advertised for university students in psychology at EO's local university who would volunteer to work with him in return for training, supervision and clinical experience

•Three motivated university students volunteered, and the OZC team travelled to EO's home to meet and train them.

• EO and his wife wrote a job description and "employment contract" that could be used in future, anticipating the likelihood that these students would move on and need to be replaced.

Support worker training

• The OZC team wrote a manual for them that could also be used for future volunteers.

•These support workers learned how to support EO to take videos and photos of daily events using his tablet in order to better access memories later when he viewed them with his wife. They also engaged him in other meaningful daily activities.

•*EO's psychological well-being improved as evidenced by a significant reduction in his emotional distress.*

General Conclusions

1.Rehabilitation makes clinical and economic sense

2. We need to draw on a number of different models and theories

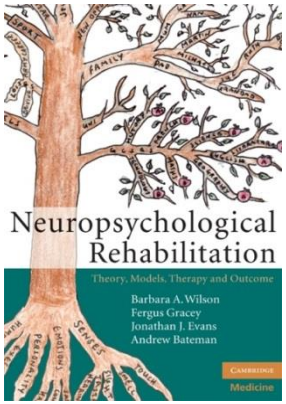
3 Rehabilitation can help people to compensate for, bypass or reduce their everyday problems and thus survive more efficiently in their own most appropriate environments

3 It IS POSSIBLE to combine theory, scientific methodology and clinical relevance.

Next meeting of the NR SIG (affiliated to the WFNR) is in Prague

- July 15th and 16th 2018
- Michael Perdices is programme chair
- For details including abstract submission email Margaret Eagers <m.eagers@unsw.edu.au>

THANK YOU VERY MUCH FOR YOUR ATTENTION



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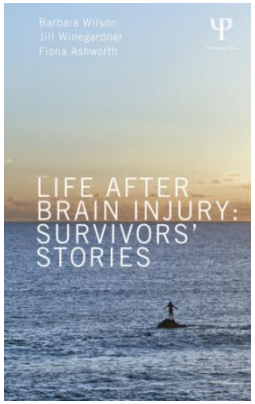

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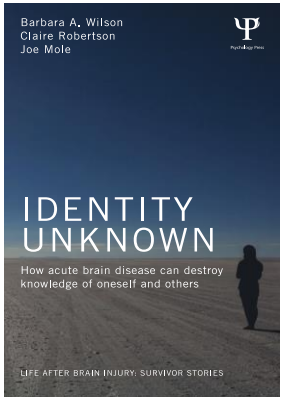

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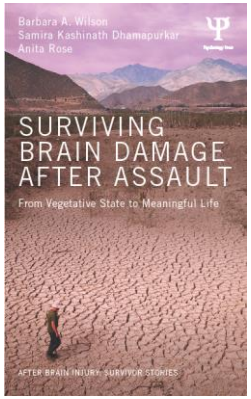

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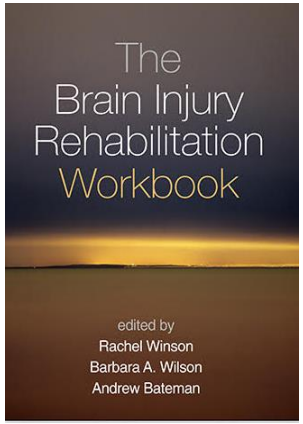

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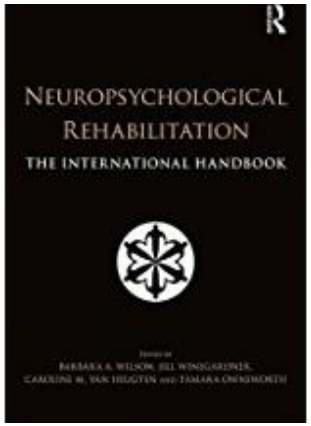

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