1. This document was created to support maximum accessibility for all learners. If you would like to print a hard copy of this document, please follow the general instructions below to print multiple slides on a single page or in black and white.
2. If you are viewing this course as a recorded course after the live webinar, you can use the scroll bar at the bottom of the player window to pause and navigate the course.
3. This handout is for reference only. Non-essential images have been removed for your convenience. Any links included in the handout are current at the time of the live webinar, but are subject to change and may not be current at a later date.
4. Copyright: Images used in this course are used in compliance with copyright laws and where required, permission has been secured to use the images in this course. All use of these images outside of this course may be in violation of copyright laws and is strictly prohibited.

How to print Handouts

- On a PC
  - Open PDF
  - Click Print
  - Choose # of pages per sheet from dropdown menu
  - Choose Black and White from “Color” dropdown
- On a Mac
  - Open PDF in Preview
  - Click File
  - Click Print
  - Click dropdown menu on the right “preview”
  - Click layout
- Choose # of pages per sheet from dropdown menu
- Checkmark Black & White if wanted.
- If more details needed please visit our FAQ page: https://www.speechpathology.com/help

Technical issues with the Recording?

- Clear browser cache using these instructions
- Switch to another browser
- Use a hardwired Internet connection
- Restart your computer/device

Still having issues?

- Call 800-242-5183 (M-F, 8 AM-8 PM ET)
- Email customerservice@SpeechPathology.com

External Cognitive Aids for Adults with Acquired Cognitive Deficits

Jessica Brown, PhD, CCC-SLP

Moderated by:
Amy Hansen, MA, CCC-SLP, Managing Editor, SpeechPathology.com

Need assistance or technical support?

- Call 800-242-5183
- Email customerservice@SpeechPathology.com
- Use the Q&A pod

How to earn CEUs

- Must be logged in for full time requirement
- Log in to your account and go to Pending Courses
- Must pass a multiple-choice exam with a score of **80%** or higher
  - Within **7 days** for live webinar; within **30 days** of registration for recorded/text/podcast formats
- Two opportunities to pass the exam

External Cognitive Aids for Adults with Acquired Cognitive Deficits

Jessica Brown, PhD, CCC-SLP

Assistant Professor

Department of Speech, Language, & Hearing Sciences

University of Arizona

jessicabrown@arizona.edu

- Presenter Disclosure: Financial: Presenter has received an honorarium for presenting this course. Non-financial: Presenter has no relevant non-financial relationships to disclose.

- Content Disclosure: This learning event does not focus exclusively on any specific product or service.

- Sponsor Disclosure: This course is presented by SpeechPathology.com.

Learning Outcomes

After this course, participants will be able to:

- Describe the impact of cognitive deficits on functional outcomes and examine rehabilitation models appropriate for this population.
- Describe a three-phase model associated with external aid selection, design, and implementation.
- List considerations for implementing external aids for cognitive deficits commonly associated with traumatic brain injury and dementia.

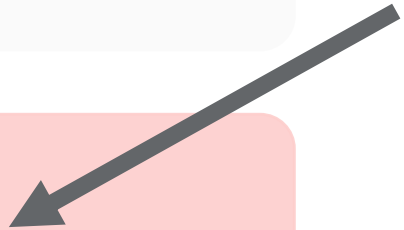
Cognitive Deficits & Impact on Functional Independence

Cognitive Deficits

Initiation	Inhibition	Processing Speed
Planning	Organization/ Sequencing	Problem Solving
Cognitive Flexibility	Self-Awareness	Attention & Memory

Rehabilitation Efforts

Personalized Education	• Diagnosis • Impact/Challenges
Direct Intervention	• Drill/practice • Restorative approaches
Compensation	• Cognitive Strategies • External Aids/Assistive Tech
Metacognition	• Self-awareness • Goal setting/prediction



Rationale for Compensation

- Attention in clinical and research reports has recently centered both on the adoption of external cognitive aids (e.g., daily planners, photographs, written lists) and the functional context in which these supports can foster independence for individuals with neurological impairments.
- Cicerone and his colleagues (2011) recommended direct attention, memory, and metacognitive strategy training coupled with the adoption of *internal and external compensatory supports* to reduce cognitive and functional disability at the post-acute stage of TBI recovery.

According to researchers, the *most efficacious and important* clinical approaches include the combined use of support materials and external cues.

Rationale for Compensation

- Maximally effective therapeutic practices should:

consider premorbid status

be individualized to a person's needs, goals, and skills

include training in assistive technology use, when appropriate

occur in contexts that minimize the need for separate generalization efforts

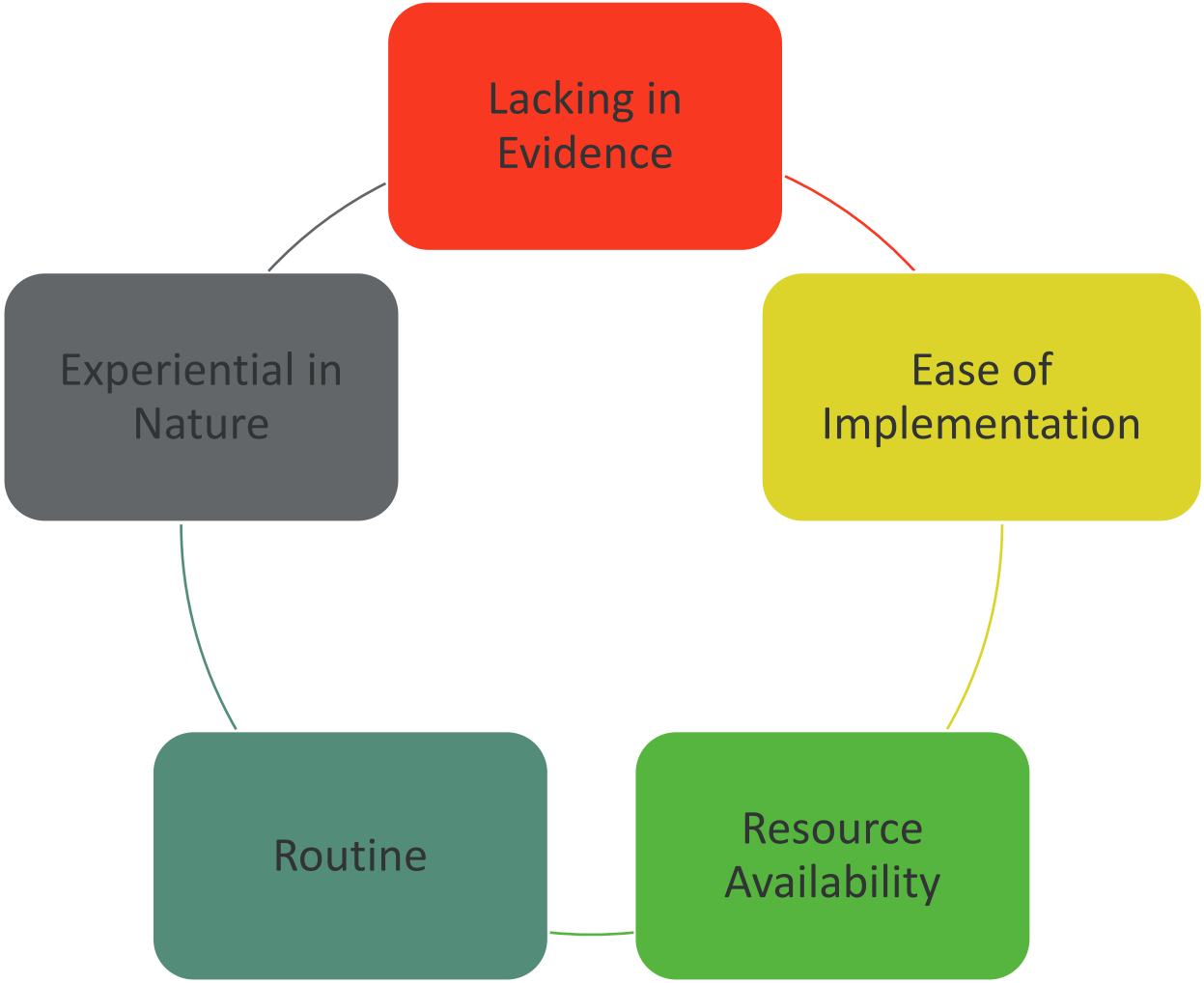
Togher, L., Wiseman-Hakes, C., Douglas, J., Stergiou-Kita, M., Ponsford, J., Teasell, R., ... & Turkstra, L. S. (2014). INCOG recommendations for management of cognition following traumatic brain injury, part IV: cognitive communication. *The Journal of head trauma rehabilitation*, *29*(4), 353-368.

Functional Impact

- The severity of an individual's persisting deficits and the consequent potential impact on daily living may vary across settings and contexts, thus resulting in the need for multiple compensation strategies or supports.
- Intervention efforts may focus on:
  a) determining the types of materials likely to be beneficial in various situations
  b) designing and personalizing support materials
  c) promoting appropriate selection of supports and their consistent use across settings

Act as brain "prostheses"

External Cognitive Aids: Current Practices



Theories of Technology Acceptance

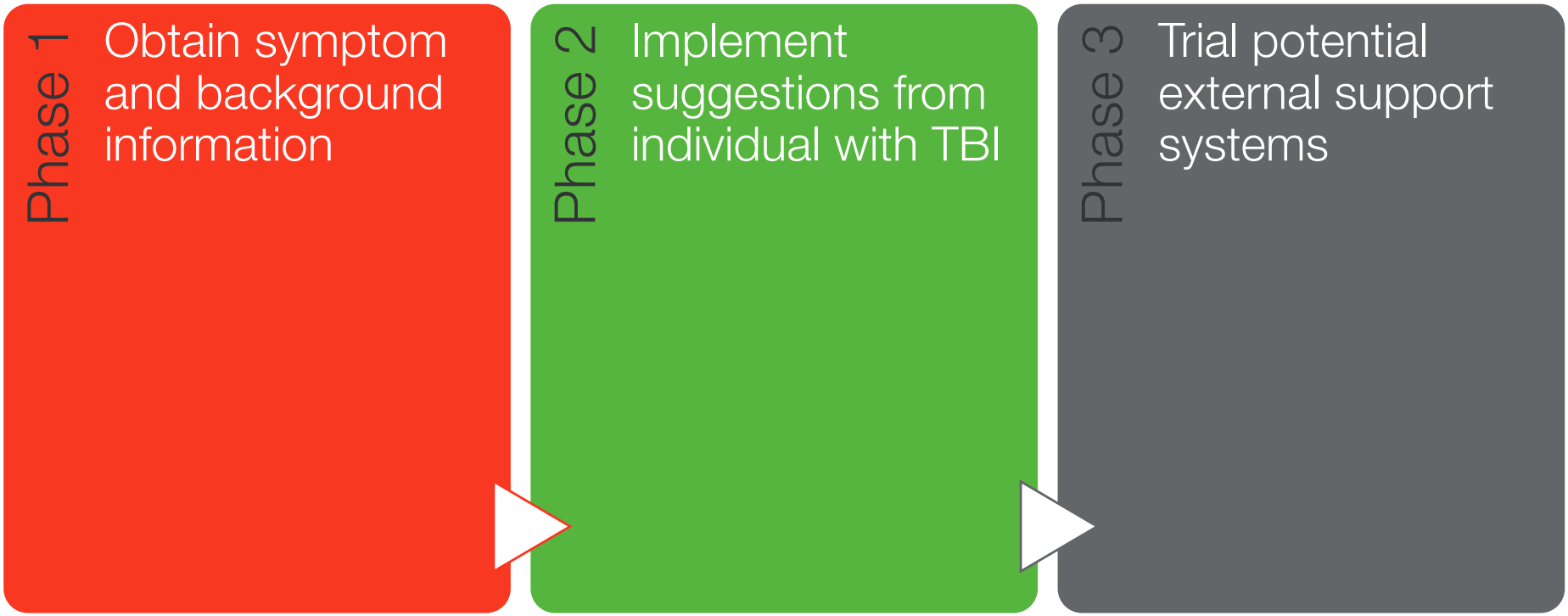
- Really, can be applied to ANY assistive aid
- Technology acceptance models and theories have been applied in a wide variety of domains to understand and to predict users' behavior
- Ideally: Decision makers need to know the issues that influence on users' decision to use a particular system so they would be able to take them into account during the development phase

Taherdoost, H. (2018). A review of technology acceptance and adoption models and theories. Procedia manufacturing, 22, 960-967.

Procedures for Evaluation and Implementation

- Matching persons with technology process
- Personal approach
- “When matching person and technology, you become an investigator, a detective. You find out what the different alternatives are within the constraints.”
- https://sites.google.com/view/matchingpersontechnology/home

Procedures for Evaluation & Implementation



Brown, J., Hux, K., Hey, M., & Murphy, M. (2017). Exploring cognitive support use and preference by college students with TBI: A mixed-methods study. NeuroRehabilitation, 41(2), 483-499.

Phase 1: Evaluation (Needs Assessment)

PHASE 1

Complete in-depth case history

Determine client's strengths and weaknesses following injury (symptoms checklist or self-report measure)

Analyze client's unique needs relating to functional outcomes and consider goals to promote independence (Motivational Interview)

Needs Assessment: Provider

- Includes anything within your typical assessment:
  - In-depth chart review and/or case history
  - Objective, standardized measures of performance (if available)… easier said than done
  - Functional or dynamic assessment of performance in naturalistic contexts

Assistive Technology Device Predisposition Assessment

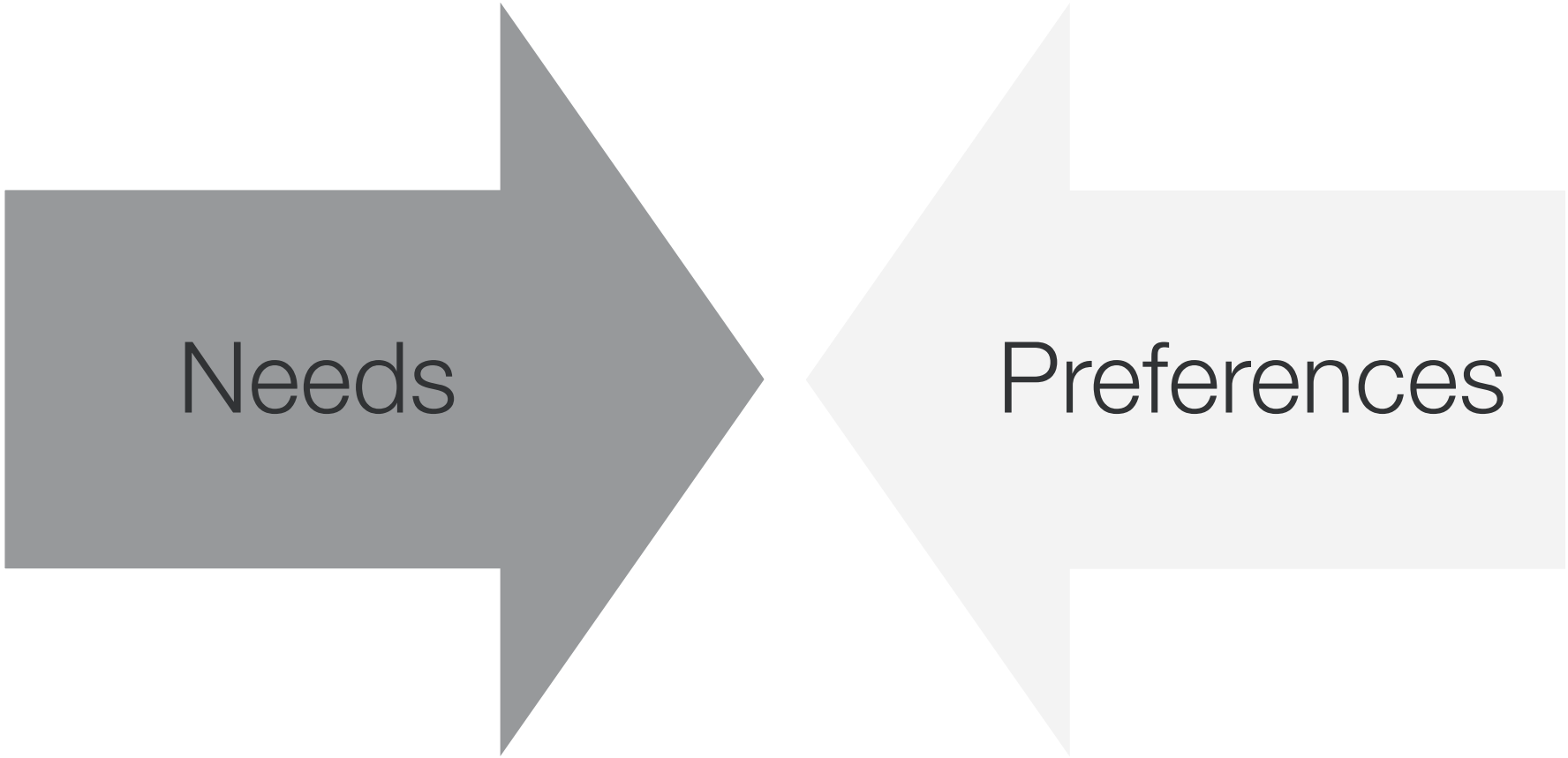
https://drive.google.com/file/d/1xikD7cUvC8ekLLMQ_cZOuSlPfqDYdjQf/view

Example Components:

- Asks questions about user's abilities (e.g., social skills, desire to go to work, desire to use technology)
- You select the degree to which the following applies:
  - Major disincentive → major incentive

Needs Assessment: Consumer

- Self-awareness may be a substantial barrier

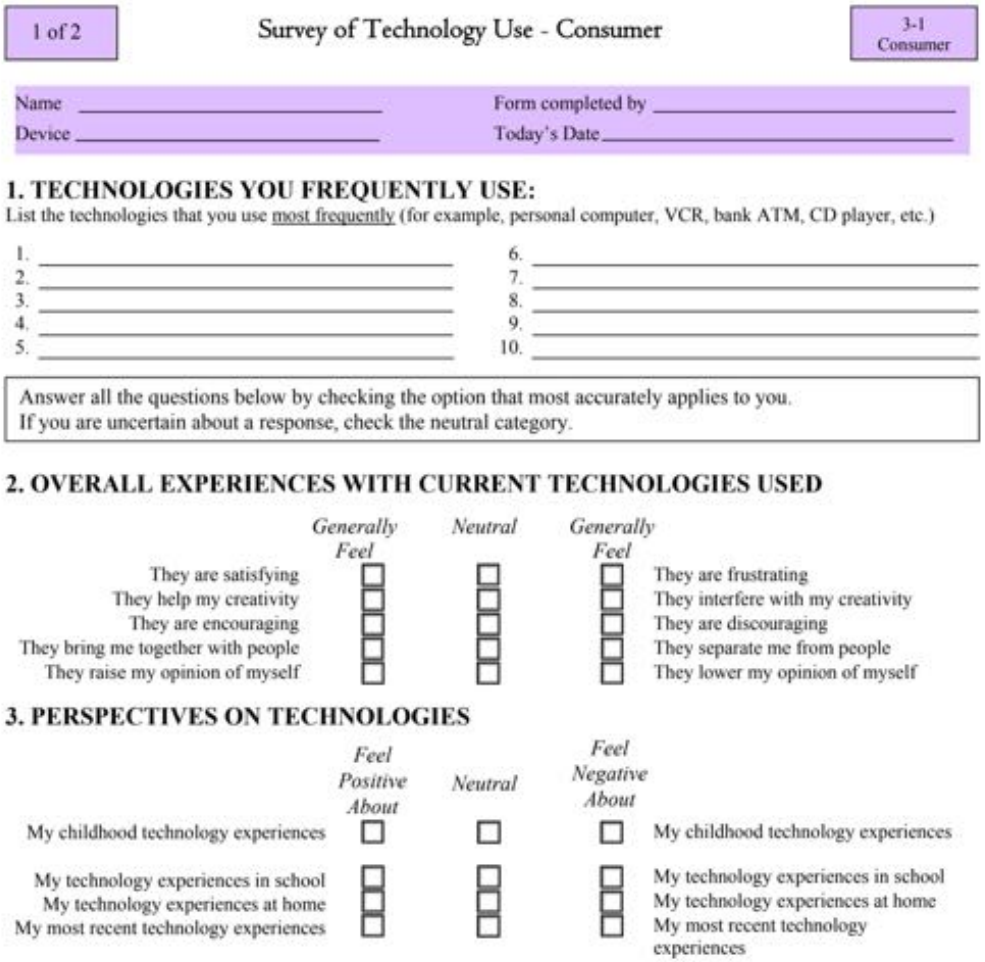


Survey of Technology Use

https://drive.google.com/file/d/1b8UmOpY-RN8VTo6OJLOSo3lX0Y9Yzlqi/view

Example Components:

- Technologies frequently used (list items)
- Experience using technologies (e.g., I generally feel technology is frustrating)
- Perspectives on technology (e.g., I feel positive about my technology experiences at home)



1 of 2

Survey of Technology Use - Consumer

3-1 Consumer

Name _____ Form completed by _____

Device _____ Today's Date _____

1. TECHNOLOGIES YOU FREQUENTLY USE:

List the technologies that you use most frequently (for example, personal computer, VCR, bank ATM, CD player, etc.)

1. _____ 6. _____
2. _____ 7. _____
3. _____ 8. _____
4. _____ 9. _____
5. _____ 10. _____

Answer all the questions below by checking the option that most accurately applies to you.
If you are uncertain about a response, check the neutral category.

2. OVERALL EXPERIENCES WITH CURRENT TECHNOLOGIES USED

	Generally Feel	*Neutral*	*Generally Feel*	
They are satisfying	☐	☐	☐	They are frustrating
They help my creativity	☐	☐	☐	They interfere with my creativity
They are encouraging	☐	☐	☐	They are discouraging
They bring me together with people	☐	☐	☐	They separate me from people
They raise my opinion of myself	☐	☐	☐	They lower my opinion of myself

3. PERSPECTIVES ON TECHNOLOGIES

	Feel Positive About	*Neutral*	*Feel Negative About*	
My childhood technology experiences	☐	☐	☐	My childhood technology experiences
My technology experiences in school	☐	☐	☐	My technology experiences in school
My technology experiences at home	☐	☐	☐	My technology experiences at home
My most recent technology experiences	☐	☐	☐	My most recent technology experiences

Needs Assessment: Informant

- Not available for all clients/patients
- May be an “answer” to the lack of self-awareness following a neurological event
- Align perspective with patient’s best interest
- May be best used for obtaining an accurate history and to make *suggestions* for future supports

Motivational Interview

- Therapeutic framework to set the stage for holistic assessment and case formulation
- To facilitative collaborative and realistic goal setting
- Promote constructive engagement in clinical rehab interventions

GOAL: You as a clinician facilitate creation of goals BY the client rather than imposing goals on a client

Medley, A. R., & Powell, T. (2010). Motivational interviewing to promote self-awareness and engagement in rehabilitation following acquired brain injury: A conceptual review. Neuropsychological rehabilitation, 20(4), 481-508.

Open-ended question	• What can I do for you? • What can I help you with? • Why are you here today?
Open-ended but directive prompt	• Tell me more about why that bothers you. • Tell me how you go about completing that task.
Reflect on what your client says to assist with elaboration	• I find it difficult to remember the little things. • It is hard to stay focused for long periods of time. • Figuring out what to do first can be really frustrating.
Summarize & Synthesize	• So what I hear you saying is…

Motivational Interview: Example

- Practitioner: Why are you here today?
- Client: I'm having problems at work. I keep doing things wrong.
- Practitioner: Tell me about how you go about your day at work.
- Client: I've always been so good at knowing what to do, but now I am always confused and forgetting to do little things.
- Practitioner: It can be difficult to remember what needs to be done and make sure it happens.
- Client: Yes, my mind wanders and I forget what I'm supposed to be doing. Sometimes I look up and two hours have gone by.
- Practitioner: So what I hear you saying is that you're struggling at work because you are confused and often lose focus or don't remember what to do next.
- Client: Yes. It's a huge problem for me.

Phase 2 Selection

PHASE 2

Discuss potential positives and negatives to various internal and external support systems

Identify the client's preferred strategies and system components to collaboratively build a multimodal external aid (feature matching)

System Options (Examples)

No-Tech	High-Tech
Post-It Notes	Notes App
White Board	Electronic Calendar
Daily To-Do Lists	Voice Memos
Monthly Calendar	Applications
Daily Planner Book	

Pros? Cons?
Likes? Dislikes?
Pick **TWO**!

Preferred System Components

Ability to be synchronized with multiple devices

"The one thing that I think is really helpful is being able to synch my calendar with my phone"

Visuospatial appeal

"I'm a very visual person so if I don't see something visually I'm not going to do it probably."

Accessibility and convenience

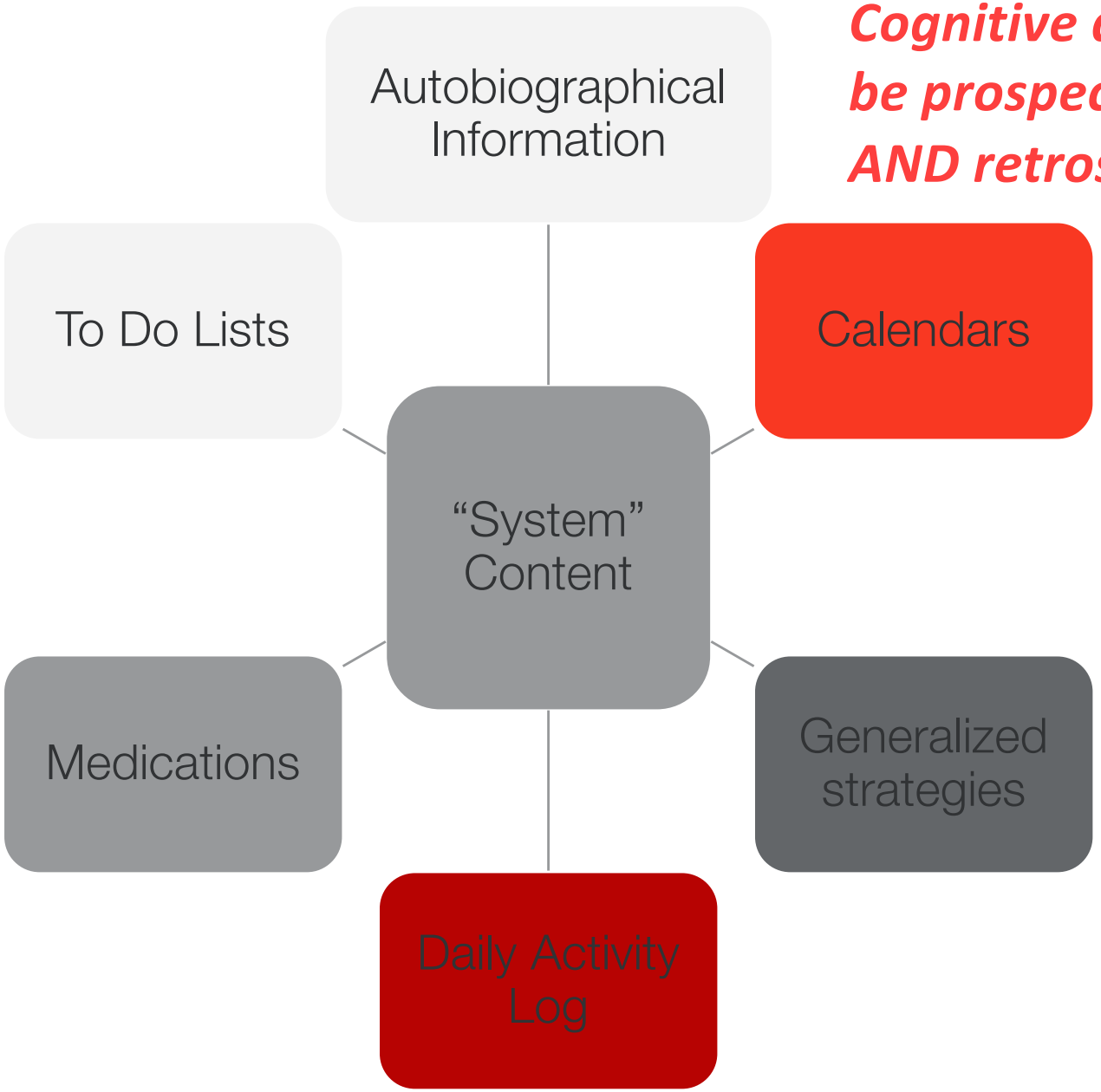
"[Electronic devices] are really accessible…that's a really big factor,"
"The [online] calendar is much more efficient 'cause of the pop-ups 'cause like I always check my phone every 15-10ish minutes"

Reminders

"There was a reminder…at the time I needed it… so that was really helpful."

Structure with space for details, but not overcrowding

"[I like] that there was a deadline and kind of a timeframe…I felt like it was easier to do when I had a calendar that showed me dates and stuff like that so I could plan it out better."



Cognitive aids can be prospective AND retrospective

Phase 3
Trial Periods
Implementation

PHASE 3

Provide training on newly developed supports/strategies

Implement short-term trials

Complete iterative system evaluation and adjustments as necessary

Training on Support System

- Clinician needs to specifically train the client on why, how, and when to use the system
- Practice with the system:
  - Provide ample practice using the strategy to develop fluency
  - Different antecedents or 'triggers' should be identified and explicitly practiced
  - Therapist should plan to practice using the strategy in real life situations (generalization, functional contexts)

Training on Support System

- Evaluation of strategy *USE* should determine the type and amount of practice
  - Take session data on:
    - Ability to recall (knowledge) the strategy
    - Ability to use the strategy in the clinic
    - Ability to do both of these things with decreasing cues/support
  - Collect real-life data on:
    - Use of the strategy in other contexts outside of therapy
    - Impact of strategy use on the target problem

continued

TEACH-M Strategy

T	Task Analysis
E	Errorless Learning/Spaced Retrieval
A	Assessing Performance (Initial, Probe, Final)
C	Cumulative Review (regularly review previously learned skills)
H	High Rates of Correct Practice (multiple times per session and over time) – shorter more frequent sessions are better
M	Metacognitive Strategy Training (example: within session prediction)

Acquisition Stage

A priority list of contents is developed to prevent cluttering of the memory aid

Systematic training: contents and purpose

Application Stage

Role play situations are used to provide patients with opportunities to use the notebook

Adaptation Stage

Notebook is used in the community setting

Behavioral reinforcement is required for notebooks to be effective

Implementing Short-Term Trials

Think of Augmentative and Alternative Communication…

- Always include trial periods before seeking funding for a device
- Cannot be sure that a system really works unless you can compare it to others
- Cannot be sure that a system really works unless you can try it in your own world

Example Functional Trial Activities

Email Activities:

Send an email at an assigned time of day:

- One paragraph about an activity completed that day
- Send a picture of yourself and write a few sentences about one of your strengths
- Tell us one thing you are thankful for and why
- Complete crossword puzzle and email a picture to researcher
- Take a short video while walking outside and email it to researchers

Google Doc Activities

On a google doc shared with Dr. Brown and Madeline:

1) Upload a map of the University and note your favorite area on campus with a star
2) Paste a link to a YouTube video of your favorite song and write a paragraph of a memory you have with the song
3) Write a paragraph reflecting on what, in your opinion, is the best way to help others
4) Complete United States Worksheet and put picture of completed sheet on GoogleDoc
5) Paste a link to a recipe you would like to make and include the price of 3 ingredients

Phone activities

Call the lab phone at a specific time and leave a message regarding:

1) The current weather (including temperature and climate) as well as the forecast for the following day
2) All of the buildings you have been to for classes so far that week
3) Say the alphabet A-Z and count backward from 10.

Send a **text message** to NAME and NAME with:

- Three sentences about your favorite sport
- A verse from your favorite song translated into Spanish, German, or Arabic
- The name of your favorite class and one fact you have learned in it

Interactive Activities:

Complete the following activities:

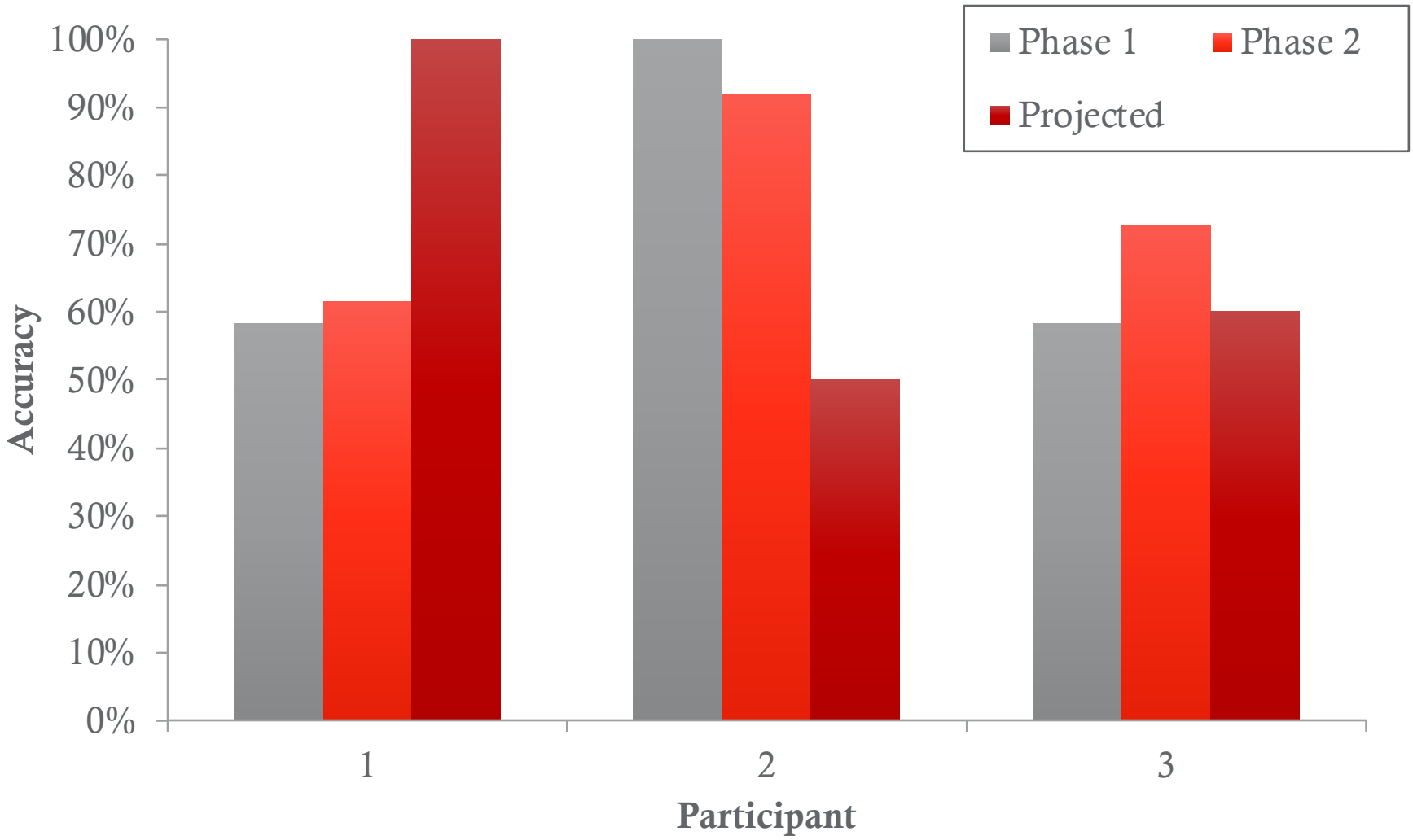
- Complete a word find, given to you by researchers and put in mailbox of Jessica Brown, located in Shevlin Hall
- Write a letter to your favorite movie character and send it via USPS to researcher
- Meet researcher at Coffman during scheduled time for a five minute meeting
- Print out a picture of yourself, and on the back of it write three words that describe yourself and bring to Shevlin Hall lab
- Complete the visual scanning worksheet and slide under door of lab in Shevlin Hall (room 22)

**Note that any activities that require you to go to Shevlin hall should be completed between 8am-4pm

Use a menu and let the client choose – enhances motivation and more closely mirrors real-world tasks!

Q4

What we learn…
Trial Period Results



What ‘we’ learn from trial periods

- Dynamic assessment
- Where exactly does the breakdown happen?
  - Remembering that an aid exists
  - Remember to use the aid when appropriate
  - Using the aid correctly
  - Etc.
- What are next steps for treatment?
- Guiding our clients and patients to make appropriate decisions – use our data!

Iterative Review & Adjustments

- Have you ever bought a planner with every great intention in the world and then after January, you never use it again?

Iterative Review & Adjustments

- Continuous training on and practice with strategy is necessary
- May need to consider a “hybrid” of systems
- Are particular systems more suited for certain activities or contexts?

Considerations for populations of adults with acquired neurological disorders

To ‘technology’ or NOT

- Age related factors are MOSTLY a myth (more to come in a minute….)
- Cognitive status will be incredibly important
- Consider premorbid abilities & desires (what they did before influences the here and now)

Kämpfen, F., & Maurer, J. (2018). Does education help “old dogs” learn “new tricks”? The lasting impact of early-life education on technology use among older adults. *Research policy*, *47*(6), 1125-1132.

To ‘technology’ or NOT

- High technology use associated with:
  - younger age
  - male sex
  - white race
  - higher education level
  - being married

Gell, N. M., Rosenberg, D. E., Demiris, G., LaCroix, A. Z., & Patel, K. V. (2015). Patterns of technology use among older adults with and without disabilities. *The Gerontologist*, *55*(3), 412-421.

Aging and Typical Cognitive Decline

- More than 50% of respondents are using cell/smart phones and computers while much fewer are using tablets and e-readers.
- Socializing (calling and emailing) and surfing the net are important activities for elders.
- Older adults report a desire to use alarms and calendar features.
- Barriers to use include lack of knowledge, negative attitudes, and age-related changes such as vision and hearing loss and fine motor difficulties.

Gitlow, L. (2014). Technology use by older adults and barriers to using technology. *Physical & Occupational Therapy in Geriatrics*, *32*(3), 271-280.

Traumatic Brain Injury

- Individuals with TBIs may experience chronic symptoms necessitating use of external cognitive supports
- Deficits resulting from TBIs are of particular concern for individuals re-integrating into higher education settings given the high cognitive demands of such environments
- Many rely on strategies or devices to compensate for cognitive deficits, but little is known about the rationale for support choice and the selection impact

TBI – Orientation & Memory

Among the most frequently reported consequences of acquired brain injury:

- Between 55% and 75% of survivors complain of persistent memory impairments affecting ability to organize, store, or recall information

- Impacts long-term memory needed for:
  - New learning
  - Relearning
  - Item recall
  - Item recognition

TBI – Executive Functions

- Refers to the use of multiple aspects of cognition to solve everyday problems
  - Requires attention, concentration, memory, sequencing, planning, abstract reasoning, problem recognition, hypothesis formation and testing, initiation and self-monitoring of behaviors, and evaluation of progress and outcomes
- Challenges with executive functioning may appear as:
  - Decreased flexibility
  - Difficulty understanding cause and effect relations
  - Difficulty prioritizing and organizing tasks
  - Poor problem solving

Dementia

- Perceived difficulty in using everyday technology increases in people with MCI and is accentuated in mild-stage dementia (Rosenberg, L., Kottorp, A., Winblad, B., & Nygård, L. (2009). Perceived difficulty in everyday technology use among older adults with or without cognitive deficits. *Scandinavian journal of occupational therapy*, *16*(4), 216-226.)
- Capitalize on spared memory systems
  - Procedural memory – an individual with dementia will read if they see something with words; an individual with dementia will flip through pages of a book if it is presented to them
- Enhancing these materials:
  - Short, explicit statements
  - Inclusion of personalized images
  - Focus on orientation

Dementia – Memory & Communication

- Memory books AS communication supports
- People with mild-moderate suspected Alzheimer's Disease
- Individualized memory wallets or cards
- Measured outcomes of conversations between trained caregivers (spouse, adult child, day staff) and individual with dementia
- Wallets – pictures and words for 3 topics:
  - Family names
  - Biographical information
  - Daily schedules

Bourgeois, M., Dijkstra, K., Burgio, L., & Allen-Burge, R. (2001). Memory aids as an augmentative and alternative communication strategy for nursing home residents with dementia. Augmentative and Alternative Communication, 17(3), 196-210.

Dementia – Memory & Communication

- Increased frequency of expressing factual information
- Decreased ambiguous, perseverative, erroneous, or unintelligible utterances
- Increased turn taking of person with dementia
- Increased number of on-topic statements

DEPRESSION!!!!

Summary

Important Considerations

- Self-report and rationale does not always mirror performance
- Selection of systems by therapists or caregivers may not be best practice
- Similarities in the external cognitive aid “components” are noted across patient groups but this is not a one size fits all
- Individuals may benefit from trialing systems themselves before making decisions
- Feature matching process
  - Client’s strengths and weaknesses
  - Client’s preference
  - Evidence-based decisions

Important Considerations

- Not all memory aids are created equal
- General topics to include:
  - autobiographical information,
  - daily schedules,
  - problem resolution or “stimulus generalization” prompts
- The presence of memory aids are great, but that isn’t enough
- Training caregivers and staff to reference aids increases communication significantly and increases quality of life!

Questions?

References

- Brown, J., Hux, K., Hey, M., & Murphy, M. (2017). Exploring cognitive support use and preference by college students with TBI: A mixed-methods study. NeuroRehabilitation, 41(2), 483-499.
- Bourgeois, M., Dijkstra, K., Burgio, L., & Allen-Burge, R. (2001). Memory aids as an augmentative and alternative communication strategy for nursing home residents with dementia. Augmentative and Alternative Communication, 17(3), 196-210.
- Gell, N. M., Rosenberg, D. E., Demiris, G., LaCroix, A. Z., & Patel, K. V. (2015). Patterns of technology use among older adults with and without disabilities. The Gerontologist, 55(3), 412-421.
- Gitlow, L. (2014). Technology use by older adults and barriers to using technology. Physical & Occupational Therapy in Geriatrics, 32(3), 271-280.
- Kämpfen, F., & Maurer, J. (2018). Does education help “old dogs” learn “new tricks”? The lasting impact of early-life education on technology use among older adults. Research policy, 47(6), 1125-1132.

References

- Medley, A. R., & Powell, T. (2010). Motivational interviewing to promote self-awareness and engagement in rehabilitation following acquired brain injury: A conceptual review. Neuropsychological rehabilitation, 20(4), 481-508.
- Rosenberg, L., Kottorp, A., Winblad, B., & Nygård, L. (2009). Perceived difficulty in everyday technology use among older adults with or without cognitive deficits. Scandinavian journal of occupational therapy, 16(4), 216-226.
- Taherdoost, H. (2018). A review of technology acceptance and adoption models and theories. Procedia manufacturing, 22, 960-967.
- Togher, L., Wiseman-Hakes, C., Douglas, J., Stergiou-Kita, M., Ponsford, J., Teasell, R., ... & Turkstra, L. S. (2014). INCOG recommendations for management of cognition following traumatic brain injury, part IV: cognitive communication. The Journal of head trauma rehabilitation, 29(4), 353-368.