

# ***Cognitive Self-Efficacy in Everyday Activities: Psychometric Characteristics of a New Scale***

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# Cognitive Self-Efficacy

- Cognitive self-efficacy (CSE) – beliefs that one can manage cognitive problems and succeed in cognitively demanding activities -- mediates engagement in activities, motivation, and use of adaptive strategies for important life activities (e.g., West et al., 2008).

# Research Aims

- This study describes a new Cognitive Self Efficacy Questionnaire (CSEQ) for use in OT for persons with potential cognitive limitations in engagement and monitoring of everyday activities. The study aims:
- To provide information on psychometric characteristics that affect its reliability and validity.
- To discern the dimensional structure of the scale (to discover whether it has 4 subscales).
- Identify items which fit versus misfit.
- To analyze the rating structure to determine whether its items can form an equal-interval scale.
- To illustrate modern test theory (Rasch analysis), including both methods of scaling to make ratings equal-interval and its implications for interpretation.

# Methods 1: Scale Development

- The CSEQ was designed to assess beliefs regarding one's ability to recognize, monitor and manage cognitive symptoms and complex activities.
- Focus groups, interviews, and professional opinions were conducted using Bandura's (2006) guidelines.
- The version tested had 66 items and 4 parts examining beliefs about ability to recognize cognitive symptoms, to manage cognitive symptoms, to respond to cognitively challenging situations, and to do cognitively demanding everyday activities.
- Items were rated on a 0-10 point subjective scale.

## CSE Questionnaire

Name \_\_\_\_\_ Date \_\_\_\_\_

This questionnaire is designed to help us get a better understanding of any symptoms you might be experiencing in the areas of attention, memory, organization and thinking.

**Directions:** Using the scale provided, please rate how certain you are that you can do each of the things described below by writing the appropriate number next to the statements

0      1      2      3      4      5      6      7      8      9      10

Cannot  
do at all

Moderately  
can do

Highly certain  
can do

**Part I – Self Recognition of symptoms**

**Confidence Level 0-10**

**In cognitively challenging activities, I am sure that I can**

1. Recognize when I forget something \_\_\_\_\_
2. Recognize when I become distracted \_\_\_\_\_
3. Recognize when I am having difficulty concentrating \_\_\_\_\_
4. Recognize when I make a mistake \_\_\_\_\_

6. Recognize when I have missed details/ information \_\_\_\_\_
7. Recognize when my mind feels cloudy...or less sharp.. \_\_\_\_\_
8. Recognize when information is being presented too fast \_\_\_\_\_
9. Recognize when there is too much information for me to process \_\_\_\_\_
10. Recognize when my strategy is not working \_\_\_\_\_
11. Recognize when I have responded too quickly \_\_\_\_\_
12. Recognize when I need to let go and move on \_\_\_\_\_



2. If you were reading a chapter in a textbook, how certain are you that you can

A. Recall and summarize the main points of the chapter after reading it.

0      1      2      3      4      5      6      7      8      9      10

Cannot  
do at all

Moderately  
can do

Highly certain  
can do

B. What are some of the potential challenges or problems that you might experience in this type of task?

C. What strategies would you use to help yourself retain and integrate the information?

3. If you were socializing with a group of 6 people in a crowded restaurant, How certain are you that you could



#### Part IV. Self Efficacy for Cognitive Everyday Tasks

**Directions:** Using the scale provided, please rate how certain you are that you can **do** each of the tasks described below. *Rate your degree of confidence by recording a number from 0 to 10, next to each statement using the scale given below.*

0      1      2      3      4      5      6      7      8      9      10

Cannot  
do at all

Moderately  
Certain can do

Highly  
Certain can do

**How certain are you that you can .....**

	Confidence (1-10)	N/A
1. Remember to pay your bills on time		
2. Follow a conversation with a group of 5 people		
3. Plan and organize a party with 25 people for a friend		
4. Recall 4-5 things that you need to do during the day without looking at a list		
5. Follow written directions to a new location that involve 7-8 steps		
6. Pay attention to details when reviewing bills		

# Methods 2: Data Collection and Analysis

- A sample of 200 ethnically diverse, community-dwelling adults (50% 18-65 in age, 50% > 65) was recruited using snowball methods.
- All were independently functioning, spoke English, had adequate hearing and vision, and had no history of neurological or psychiatric disease.
- Questionnaires were completed in a variety of community settings, including homes and senior centers in a tri-state area.
- Data were analyzed using
  - classical test methods (factor analysis) and then
  - using Rasch analysis (Winsteps).

# Results

- Participants reported high CSE (mean = 8.14, range = 6.91 – 9.05).
- The lowest rating categories (0-4) were infrequently used (3.77%). Internal consistency over all 66 items was high (alpha = .976).

## *Results: Dimensionality*

- Factor analysis (Equimax rotation) revealed
  - 1 major factor explaining 40.3% of the variance.
  - This factor loaded on items in all 4 CSEQ sections and was interpretable as general CSE.
  - Rasch analysis also revealed one major linear measure. It explained 43.5% of variance.

## *Results: Rasch analysis*

- Item separation reliability was high (.94) as was person separation reliability (also .94).
- Only one item misfitted (mean-square infit and outfit both  $> 2$ ) and hence needs to be excluded (or rewritten and retested).
- Items had a similar range of difficulty.
- The distance between ratings of 9 and 10 was greater than that between other levels.

TABLE 2.6 CSEQ\_Corrected-May.29.jt.mvj.sav Output.run.2b May 31 16:59 2012  
 INPUT: 200 PERSON 66 ITEM REPORTED: 200 PERSON 66 ITEM 11 CATS WINSTEPS 3.73

¶  
 Comments on item-category to measure map: Little difference in average measure level across items. Because all items are at similar difficulty level, item separation is constrained. As one can see, category levels are slightly disordered. ¶

¶  
 OBSERVED AVERAGE MEASURES FOR PERSON (unscored) (BY OBSERVED CATEGORY)¶

-1	0	1	2	3	4	NUM	ITEM
	24 356	7 89	10			37	PART3_2A
	4620357	89 m	10			55	PART4_14
	2 3 45 0678	9	10			12	PART1_12
	24 5367	8 9	10			25	PART2_9
	3 4567 8 9	10				38	PART3_3A
	43567	8 9	10			20	PART2_4
	3 62457 8 9	10				33	PART2_17
	340 2567 8 m9	10				58	PART4_17
	3 4567 8 9	m 10				52	PART4_11
	3 456 7 8 9	10				26	PART2_10
	124 365 78 09	10				5	PART1_5
	3 4 6 527m 89	10				36	PART3_1A
	243 5 678 9	10				13	PART1_13
	42 536 7 8 9	10				23	PART2_7
	546 7 83 9	10				24	PART2_8
	43 657 28 9	10				45	PART4_4
	4 53678 9 m 10					54	PART4_13

¶  
 DELETED SECTION¶

	24	57 689	10			3	PART1_3
	43	m6758 9	10			49	PART4_8
	3 6 4 25789	10				8	PART1_8
	3 6 5 78 9	10				9	PART1_9
	4 5 738 m96	10				65	PART4_24
	52m67 89	10				42	PART4_1
	5 6 78 1m9	10				66	PART4_25

## *Results, continued*

- Low-CSE ratings were disordered and unrelated to general CSE.
- Combining levels 0-4 produced a monotonic scale.
- The scale was reasonably targeted to the client sample in difficulty level of items versus persons.

## *Results, continued*

- Subjective CSE was not correlated with age ( $r = .03$ ), estimated intelligence ( $-.03$ ; Barona, et al., 1984), gender, race, education, or occupation.
- Qualitative questioning revealed themes about cognitive challenges and strategies to enhance function in cognitively-demanding activities.
- A shorter scale may be possible.

# Discussion and Conclusions

- Subjective CSE can be measured -- approximately.
- Surprisingly, both factor analyses and Rasch analysis showed that CSE was unidimensional; items tapped the same latent dimension across the 4 parts of the CSEQ.
- A shorter scale may well be possible.
- Responses using the lowest levels of the 0-10 point rating scale were undiscriminating and inconsistent. Recoding to a simpler rating scale produced a more monotonic equal-interval measure.
  - (This result is congruent with Smith et al (2003), who demonstrated that Self-efficacy for Writing among grade school students is better measure by a 4-point scale than a 10-point scale. )

## *Discussion and Conclusions, cont.*

- Wider lessons:
  - People cannot monitor their cognitive abilities with any precision.
  - Overly detailed rating scales can inject more error than meaning into a scale.
  - Equal-interval structure on paper is not equal-interval structure in the construct being measured.
- OTs should be able to provide more insightful therapy if they can measure and understand not only physical activities but also how their clients perceive the cognitive aspects of their own occupational performances.

# References

- Bandura A, Ed. (2006). *Guide for Creating Self-Efficacy Scales*. Greenwich, CT: Information Age Publishing.
- Barona, A., Reynolds, C. R. & Chastain, R. (1984). A demographically based index of premorbid intelligence for the WAIS-R. *Journal of Consulting and Clinical Psychology*, 52(5), 885-887.
- Costello, Anna B. & Jason Osborne (2005). Best practices in exploratory factor analysis. *Practical Assessment Research & Evaluation*, 10(7). Available online: <http://pareonline.net/getvn.asp?v=10&n=7>
- Linacre, J.M. (2011) Winsteps 3.73 12-04-2011. Chicago, IL. Winsteps.com
- Smith, E.V., Wakley, M.B., de Kruif, R. E.L. (2003) Optimizing rating scales for self-efficacy (and other) research. *Educational and Psychological Measurement*, 63, 369-391.
- West, R. L., Bagwell, D. K., & Dark-Freudeman, A. (2008). Self-efficacy and memory aging. *Neuropsychology, Development, and Cognition*. Section B., 15(3), 302-329.

# Words on the Sponsor

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