

It's Raining Cats: Further Development of Discourse Checklists for Picture Description Tasks

Trisha Tanaka, Wesley Branch, Sarah Grace Dalton, Jessica D. Richardson

Neuroscience of Rehabilitation Laboratory, Department of Speech and Hearing Sciences

University of New Mexico



Background

- Individuals with language disorders demonstrate impaired narrative ability and a resultant decline in functional communication.¹
- Current discourse measures have standardized instructions but few norm-references.
- Main Concept Analysis (MCA) is a reliable, valid method of assessing gist production² and standardized and norm-referenced lists have recently been developed for 3 discourse tasks.³
- Core Lexicon (CoreLex) checklists provide a time-efficient and informative index of functional communication ability.^{4,5}

Specific Aim 1: To develop Main Concept and Core Lexicon lists for Cat Rescue and Refused Umbrella sequential picture description tasks from the AphasiaBank protocol.

Specific Aim 2: To report normative performance on these lists.

Methods

Database:

- Transcripts of control participants were retrieved from the **AphasiaBank** database. All participants completed the AphasiaBank protocol with standardized administration.
- Transcripts from 92 individuals (55 female, 37 male; 88 Caucasian, 2 African American, 2 Hispanic/Latino) were selected to serve as the normative sample to match that used previously.³
 - 5 participants did not complete Cat Rescue due to a change in the protocol. Matched controls were identified to replace these participants and maintain sample size.
- Demographics for each story are:
 - Refused Umbrella: mean age 58.3 (± 21.6); mean education 15.6 (± 2.5)
 - Cat Rescue: mean age 58.8 (± 21.7); mean education 15.6 (± 2.4)

Relevant Concepts (RCs):

- RCs are defined as correct utterances about the story that contained a subject, one main verb, and object (if appropriate).
 - A master list of all relevant concepts was developed for the two stories.
 - As new concepts were identified, they were added to the list.
- All normative sample transcripts were analyzed and frequency counts gathered.

Main Concepts (MC):

- Relevant concepts spoken by 33% or more of the normative sample were MCs.
- After identifying MCs, the normative sample transcripts were coded according to published guidelines.² The possible codes are:
 - Absent (AB): The participant did not produce any portion of the MC
 - Inaccurate/Incomplete (II): The participant attempted to produce a portion of the MC, but it was missing at least one essential element and another essential element was incorrect.
 - Inaccurate/Complete (IC): The participant produced a complete MC, but at least one essential element was inaccurate.
 - Accurate/Incomplete (AI): The participant produced an accurate MC, but at least one essential element was missing.
 - Accurate/Complete (AC): The participant produced all essential elements, and all essential elements were correct.
- Codes were assigned a numeric value with AB = 0, II = 1, IC = 2, AI = 2, AC = 3.
 - Scoring system was adapted⁶ to give equal weight to semantic and phonemic errors.
- Scores for each MC for each story were summed to yield a Story Composite.

Core Lexicon (CoreLex):

- The entire lexicon for the picture descriptions was identified using the CLAN command: **freq +t*PAR +s"@r-*,|-*,o-%" +o *.gem.cex +d2 -s"[+exc]"**
- Lemmas produced by 50% or more of control participants were considered core.
- CoreLex production was scored using this list:
 - Individuals received a "1" if the lemma was produced and a "0" if it was absent.
 - The sum of values across a story served as the CoreLex score.

Normative Lists

Cat Rescue Main Concept List

1. **The little girl was riding her tricycle.**
2. **The cat was stuck in the tree** because the dog chased/scared it.
3. **The dog was barking** at the tree.
4. **The man climbed up the tree** to get the cat.
5. **The ladder fell down.**
6. **The father is stuck in the tree** with the cat.
7. **Someone called the fire department.**
8. **The fire department comes** with a ladder.
9. **The fire department rescues them.**

Cat Rescue Core Lexicon

A	And	Bark	Be	Call	Cat
Climb	Come	Dad	Department	Dog	Down
Fire	Get	Girl	Go	Have	He
Her	In	Ladder	Little	Not	Out
So	Stick	The	Their	There	To
Tree	Up	With	Fireman		

Refused Umbrella Main Concept List

1. The mother says **it is going to rain** today.
2. The mother says **you need to take the umbrella.**
3. **The boy doesn't want (or actively refuses) the umbrella.**
4. **The boy walks to school.**
5. **It is raining.**
6. **The boy gets soaking wet.**
7. **The boy runs back** and goes into the house.
8. **The mother is [negative emotional state].**
9. **The boy gets the umbrella.**
10. **The boy goes** back to school/with the umbrella.

Refused Umbrella Core Lexicon

A	And	Back	Be	Boy	Do
Get	Go	Have	She	He	Home
In	It	Little	Mother	I	Need
Not	Out	Rain	Say	School	So
Start	Take	That	The	Then	To
Umbrella	Walk	Wet	With	You	

References:

1. Webster, J., Franklin, S., & Howard, D. (2007). An analysis of thematic and phrasal structure in people with aphasia: What more can we learn from the story of Cinderella?. *Journal Of Neurolinguistics*, 20(5), 363-394.
2. Nicholas, L.E., Brookshire, R.H. (1995). Presence, completeness, and accuracy of main concepts in the connected speech of non-brain-damaged adults and adults with aphasia. *Journal of Speech, Language, and Hearing Research*, 38, 145-156.
3. Richardson, J. D., & Dalton, S. G. (2016). Main concepts for three different discourse tasks in a large non-clinical sample. *Aphasiology*, 30(1), 45-73.
4. Fromm, D., Forbes, M., Holland, A., & MacWhinney, B. (2013). PWAs and PBJs: Language for describing a simple procedure. Poster presented at CAC, Tucson, AZ.
5. Dalton, S. G., & Richardson, J. D. (2015). Core-Lexicon and Main-Concept Production During Picture-Sequence Description in Adults Without Brain Damage and Adults With Aphasia. *American Journal of Speech-Language Pathology*, 24(4), S923-S938.
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Table 1. Proportion of each Nicholas and Brookshire code for each story.

	Cat Rescue	Refused Umbrella
AC	0.579	0.742
AI	0.032	0.026
IC	0.001	0.009
II	0	0
AB	0.288	0.223

Table 2. Descriptive statistics for Main Concept production in the normative sample.

	Cat Rescue			Refused Umbrella		
	Mean (SD)	Median	Range	Mean (SD)	Median	Range
MC Attempts	6.12 (1.54)	6	3 – 9	7.77 (1.42)	8	3 – 10
MC Composite	18.03 (4.58)	18	8 – 27	22.97 (4.24)	24	9 – 30

Table 3. Descriptive statistics for Core Lexicon production in the normative sample.

	Cat Rescue			Refused Umbrella		
	Mean (SD)	Median	Range	Mean (SD)	Median	Range
Core Lexicon Score	26 (3.39)	26	16 – 33	26.64 (3.06)	27	17 – 32

Figures 1 and 2. Q-Q Plots showing normality for Core Lexicon scores.

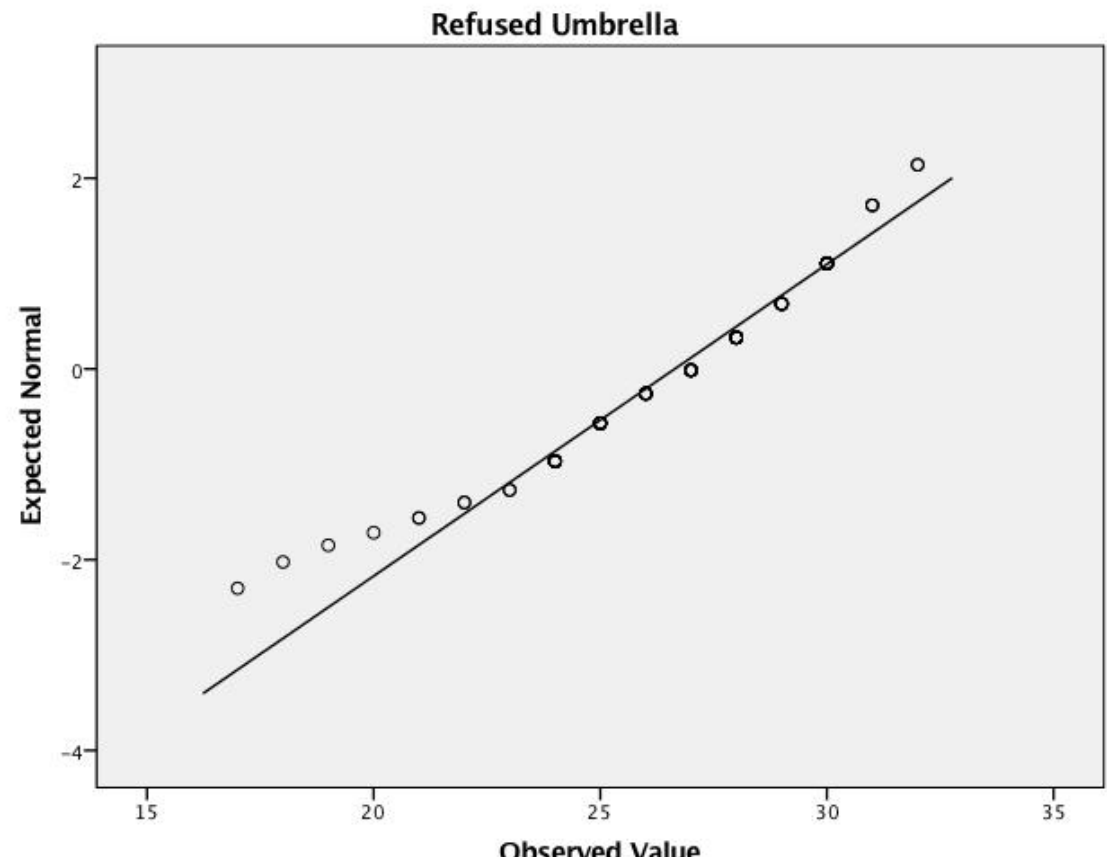
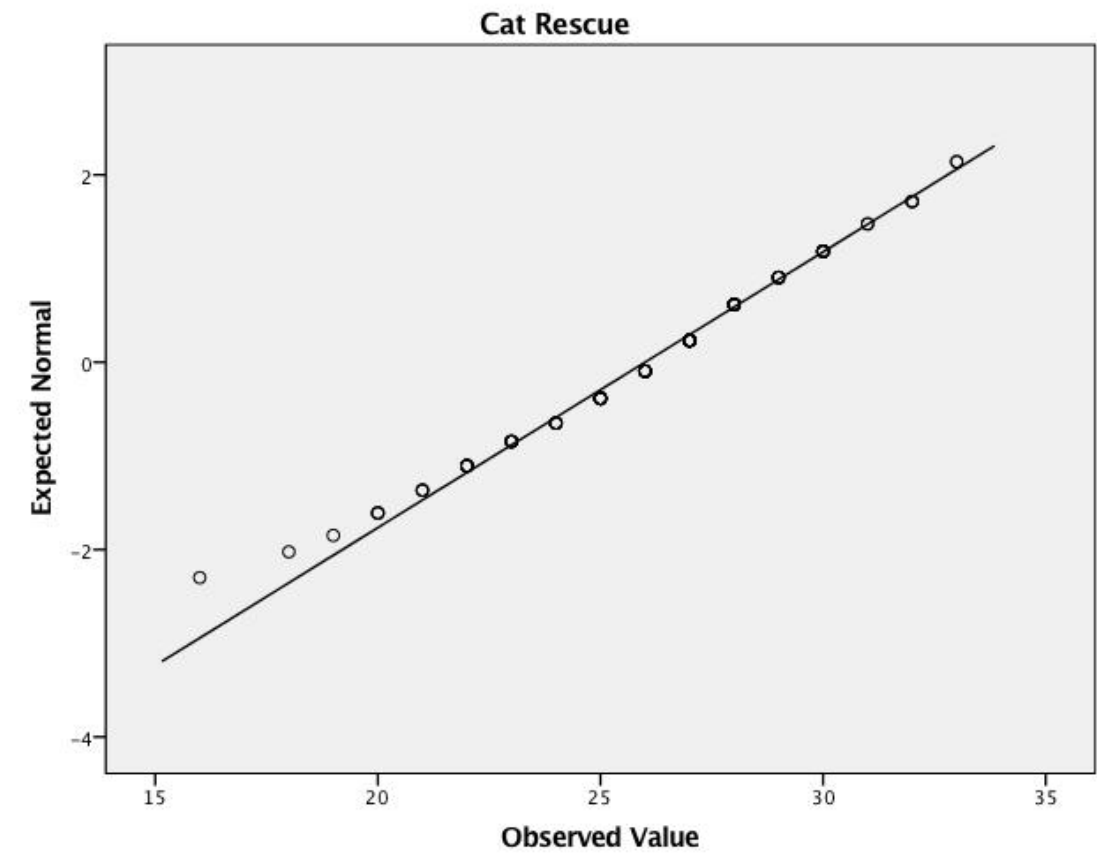
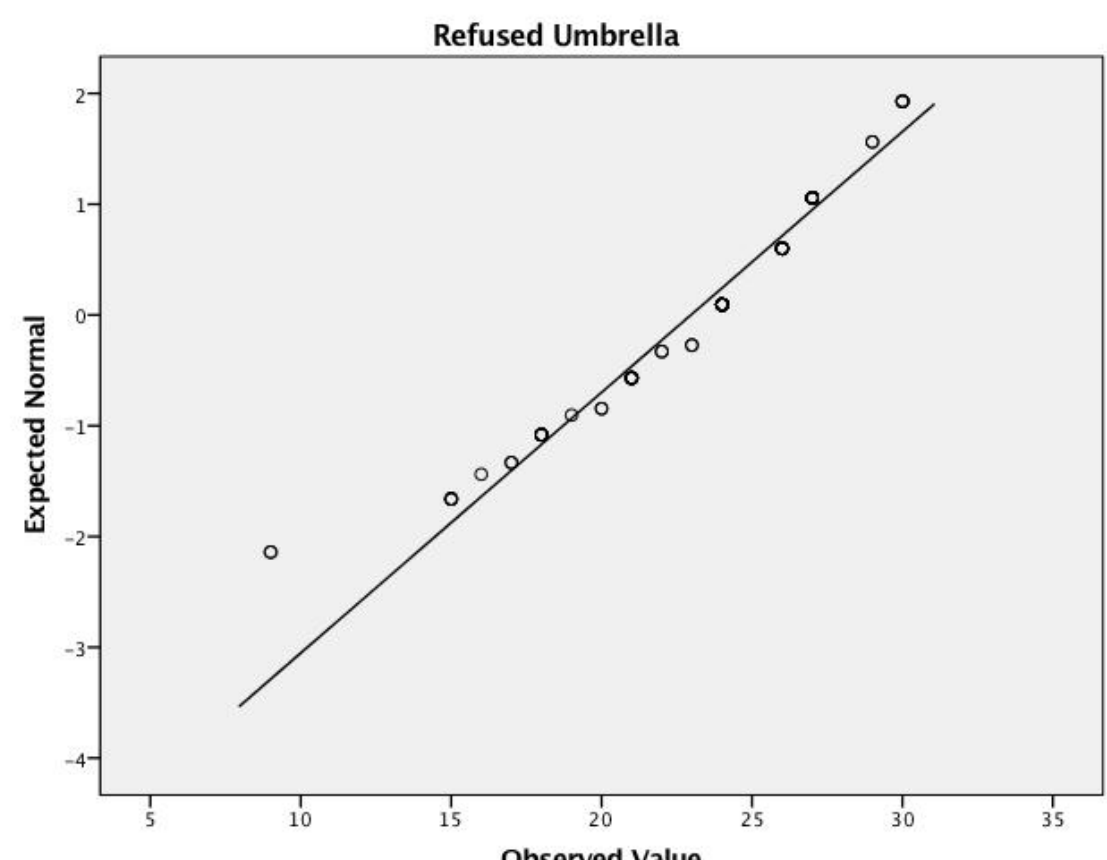
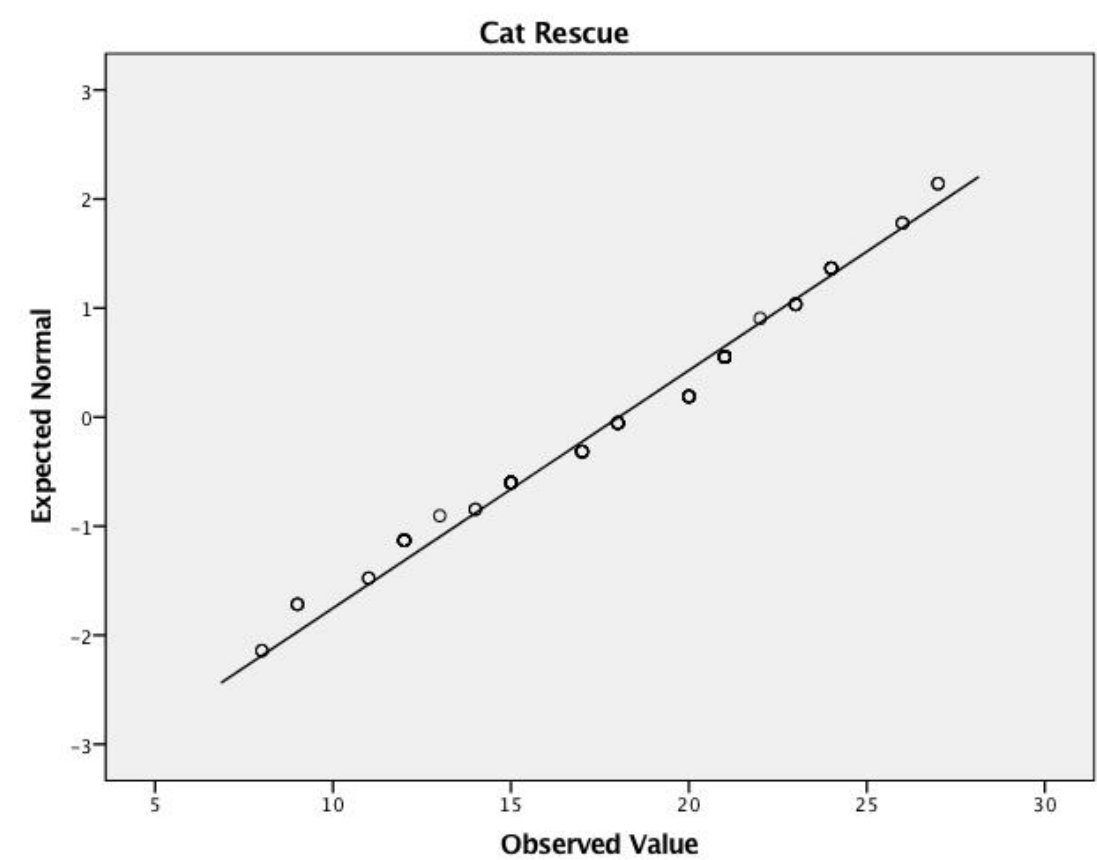


Figure 3 and 4. Q-Q Plots showing normality of MC Composite Scores.



Discussion

- We have established a set of standardized and normed results for two additional discourse tasks that clinicians can use to quickly evaluate discourse and compare to same-age peers.
- There now exist MC and CoreLex lists for all of the picture elicited discourse samples in the AphasiaBank protocol.
- The generated lists could serve as clinically useful non-transcription-based checklists for narrative assessment when discourses are elicited according to AphasiaBank protocols.
- The availability of these lists for the Broken Window, Cat Rescue, and Refused Umbrella tasks may allow for analysis of a comparable discourse task when using the same task is not ideal (i.e., short test-retest intervals) since these tasks yielded lists of approximately the same length.
- However, the comparability of these lists should be directly examined.