

Communicative Effectiveness Profile

The Communicative Effectiveness Profile (CEP) was developed by Menn, Ramsberger, and Helm-Estabrooks (1994) as an approach to analyzing BDAE “cookie theft” picture descriptions and other narratives. The CEP provides guidelines for counting correct information units produced and for computing two major indexes: the index of lexical efficiency, which measures the ratio of informative words to total words produced, and the index of grammatical support, which measures the grammaticality of the phrases that contain these informative words. This system allows a clinician to determine the extent to which an individual may display emptiness of speech or agrammatic speech. These measures may be augmented with a count of the number of neutral probes (e.g., “How about over here?”) that the examiner had to use to obtain a more complete speech sample from the PWA. Information extracted by nonneutral probes (e.g., “What is the mother doing?”) is excluded from the analysis because the PWA’s task is to describe the picture in such a way that someone not familiar with its contents would have a good sense of what it depicts.

CEP Procedure

Obtain Narrative Discourse Sample

Present target action picture (e.g., BDAE “cookie theft”) to the PWA with the following instructions: “Describe everything you see going on here. Try to use full sentences.” If an incomplete description is elicited, neutral probes may be used (e.g., “What about over here?” “Anything else?”). The verbal description is tape-recorded and later transcribed and analyzed according to the following measures.

CEP Step 1: Count Total Number of Words Produced

The clinician should count the total number of words that the individual has produced in response to a request to provide a narrative description of a pictured scene. The following should be counted:

- Correct words
- Incorrect words
- Self-corrections
- Repetitions
- Fragments that seem to be identifiable as broken-off words
- Paraphasic words
- Words in relevant statements
- Words in digressions
- Use of *a* as a grammatical word
- Words in frame statements (e.g., “Now let’s see here . . .”)
- Words in comments (e.g., “This is a bad picture”)

The following should not be counted:

- Responses to “leading” (nonneutral) probes (e.g., “What is she doing?”)
- Hesitation noises and interjections (“um,” “ah,” “er,” “hm”)
- Untranscribable mumbles
- Fragments identified as false starts on a word that eventually is produced

Nonaphasic speaker sample: Average number of words = 80 (range = 46–150)

CEP Step 2: Count Number of Correct Content Units

Correct content units are discrete, new bits of information supplied by the narrator. List each correct content unit, and then underline and count each one, using the following guidelines:

- Words that describe correct elements of the pictures, such as “the girl,” “is reaching,” and “for a cookie”
- Single pieces of information conveyed by several words (e.g., “turn it off,” “trying to get things out”—count one content unit for each group)

- Correct personal pronouns (e.g., “she” for *mother*)
- Only the best mention of a content unit that is repeated without adding more information
- Reuse of words that convey additional information (e.g., “The boy—is reaching” and later “the boy—is falling”)
- Incomplete correct content words that give sufficient information to be understood (e.g., “chil-ren” for *children*)
- Interjections that convey meaning of picture content (e.g., “Oops!”)

The following should not be counted:

- Words that give misleading information about picture content
- Misleading paraphasias (e.g., “chair” for *stool*, “pup” for *cup*)
- Neologisms
- Incorrect personal pronouns (e.g., “he” for *mother*)
- Informative words that are repeated and do not add information to the narrative (place these words in parentheses)
- Interjections that carry meaning only by virtue of intonational contour (e.g., “Oh”)

Nonaphasic speaker sample: Average number of content units = 18 (range = 13–24)

CEP Step 3: Count Number of Correct Words in Content Units

This step involves counting the total number of correct words contained within each correct content unit. The following should be counted:

- All correct words in each content unit—each content unit, of course, contains at least one correct word, but it may contain other correct words (e.g., “the mother,” two correct words; “is falling over,” three correct words)

The following should not be counted:

- Incorrect words in a content units (e.g., the phrase “I suppose he must be their mother” has six correct words and one incorrect word, *be*, which is excluded from the count for a total of six correct words)

CEP Step 4: Count Number of Correct Bound and Contracted Grammatical Morphemes

This step involves identifying the number of correct bound and contracted grammatical morphemes (i.e., endings) on correct words in content units produced by the narrator.

Count the following:

- Bound grammatical morphemes on plural, past, possessive *-s*, *-ing*, and so on
- Contracted grammatical elements such as the negative *-n't* and the verb forms *-s* (e.g., “he’s”), *-re* (e.g., “they’re”), and *-ll* (e.g., “he’ll”)

Do not count the following:

- Incorrect endings (e.g., “stools”) because there is only one stool in the picture
- Endings on incorrect words (e.g., “chairs”) because there is no chair in the picture

Using these four numbers (total number of words, number of correct content units, number of correct words in content units, and number of correct bound and contracted grammatical morphemes in content units), proceed to compute the two indexes of communicative effectiveness: the index of lexical efficiency (ILE) and the index of grammatical support (IGS).

CEP Step 5: Compute the Index of Lexical Efficiency

The index of lexical efficiency (ILE) is a ratio of the total number of words in the narrative response divided by the number of correct content units produced. Unlike nonaphasic speakers, individuals with aphasia may produce many words that are useless to the listener or may not be part of any content unit, thus yielding a high index of lexical efficiency (too many words vis-à-vis content). Others may produce only content words, thus giving their narrative a telegraphic quality.

ILE formula: = Total number of words produced / number of correct content units

Nonaphasic speaker sample: Average ILE = 3.7 (range = 2.5–5.0)

CEP Step 6: Compute Index of Grammatical Support

The index of grammatical support (IGS) indicates the average number of “supporting words” and grammatical morphemes in each content unit. The lowest possible IGS is 1.0, for the production of only content words with no grammatical morphemes (e.g., “Boy. Cookie. Mother. Wash.”).

IGS formula: Total number of words in content units + total number of correct grammatical endings / number of content units

Nonaphasic speaker sample: Average IGS = 3.6 (range = 2.3–5.5)

CEP Analyses of Picture Descriptions

For illustration purposes, the following examples will demonstrate the use of the Communicative Effectiveness Profile for analyzing BDAE “cookie theft” picture descriptions. These were obtained from one nonaphasic speaker and two PWA with nonfluent, agrammatic aphasia.

Sample I: Nonaphasic High School Graduate (Control Participant)

“A mother and two kids in the kitchen. The mother is washing dishes. The water is running in the sink. The two kids, the boy and a girl. . . . The boy is on a stool; the stool is falling. The girl is reaching for the cookies that the boy was going to get. The sink is running over. The mother is standing washing the dishes; the water’s running on the floor. The stool is falling. A cup . . . two cup [sic] and a dish in the mother’s hand. The mother’s standing up in the water.”

Total number of words: 92; number of probes: 0

Correct CUs	Correct words in CUs	Endings in CUs
1. a mother	2	
2. and two	2	
3. kids	1	-s
4. in the kitchen	3	
5. (the mother) is washing	4	-ing
6. dishes	1	-es
7. the water	2	
8. is running	2	-ing
9. in the sink	3	
10. (the two kids) the boy	5	-s
11. and a girl	3	
12. the boy	2	
13. is on	2	
14. a stool	2	
15. (the stool) is falling	4	-ing
16. the girl	2	
17. is reaching	2	-ing
18. for the cookies	3	-s
19. (that the boy) was going to get	7	-ing
20. (the sink) is running over	5	-ing
21. the water’s	2	-s
22. (running) on the floor	4	-ing
23. two	1	
24. cup	1	
25. and a dish	3	
26. (in the mother’s) hand	4	-’s
27. (the mother’s) standing up in the water	7	-’s, -ing
Totals: 27	79	15

Index of lexical efficiency: $92 / 27 = 3.4$

Index of grammatical support: $(79 + 15) / 27 = 94 / 27 = 3.5$

Sample 2: Nonfluent, Agrammatic Aphasia

"Water. The girl down. Washing the dishes. She got . . . cookies. Fall down. He got cookies."

Total number of words: 15; number of probes: 0

Correct CUs	Correct words in CUs	Endings in CUs
1. water	1	
2. the girl	2	
3. washing	1	-ing
4. the dishes	2	-es
5. She got . . . cookies	3	-s
6. fall down	2	
7. he got cookies	3	-s
Totals: 7	14	4

Index of lexical efficiency: $15 / 7 = 2.1$

Index of grammatical support: $(14 + 4) / 7 = 18 / 7 = 2.6$

Sample 3: Nonfluent, Agrammatic Aphasia

"On the stool. Girl. Reached . . . at the cookie jar. Girl . . . reaching . . . at the cookie jar. Woman . . . wiping . . . the dishes. Faucets . . . is flowing . . . on the linoleum. Dirty dishes . . . and cup . . . is standing around. That's all."

Total number of words: 34; number of probes: 0

Correct CUs	Correct words in CUs	Endings in CUs
I. on the stool	3	
2. girl	1	
3. reached at	1	-ed
4. the cookie	2	
5. jar	1	
6. woman	1	
7. wiping	1	-ing
8. the dishes	2	-es
9. faucets	1	-s
10. is flowing	1	-ing
II. on the linoleum	3	
12. dirty	1	
13. dishes	1	-s
14. and cup	2	
Totals: 14	21	6

Index of lexical efficiency: $34 / 14 = 2.3$

Index of grammatical support: $(21 + 6) / 14 = 27 / 14 = 1.9$