

Main Concept Analysis

Training Manual

v02.23.2021

(Broken Window as training example)

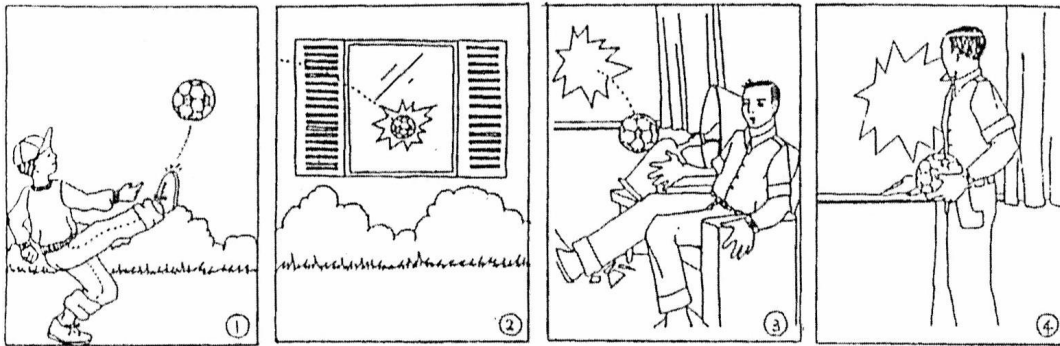


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Introduction

Main Concept Analysis (MCA) is a discourse assessment originally developed by Nicholas and Brookshire (1995) that measures the informativeness of a discourse sample about a given topic. Main concept checklists for several widely used tasks (including picture description, picture sequence, story retell, and procedural stimuli) have been developed based on discourse samples of control speakers (Richardson & Dalton, 2016; 2020). MCA is a hybrid discourse measure that provides some information on micro-linguistic features of the discourse sample as well as more macro-linguistic features about the overall adequacy of the discourse sample to communicate an intended message.

MCA has shown good sensitivity in differentiating between controls and individuals with communication disorders (e.g., Kong, Whiteside, & Bargmann, 2016; Dalton & Richardson, 2019) and between individuals with fluent and non-fluent aphasia (Kong et al., 2016). Importantly, studies have shown that changes in informativeness are associated with treatment performance (Albright & Purves, 2008; Avent & Austermann, 2003; Coelho, McHugh, & Boyle, 2000; Cupit, Rochon, Leonard, & Laird, 2010; Stark, 2010) and are associated with listener's perceptions of communication quality (Cupit et al., 2010; Ross & Wertz, 1999).

Each main concept consists of several *essential elements*, corresponding to the subject, main verb, object (if appropriate), and any subordinate clauses (Nicholas & Brookshire, 1995). The main concept is assigned one of 5 codes depending on the accuracy (are the essential elements accurate?) and completeness (are essential elements present?) of the production.

Coding:

- AC = accurate and complete = contains all elements of the main concept on the checklist with no incorrect information
- AI = accurate and incomplete = contains no incorrect information, but leaves out at least one essential element of the main concept on the checklist
- IC = inaccurate and complete = contains at least one incorrect piece of essential information (e.g., “knight” for “prince”) but includes all essential elements of the main concept on the checklist
- II = inaccurate and incomplete = clearly corresponds with a main concept on the checklist but includes at least one incorrect essential element and fails to include at least one essential element
- AB = absent = did not produce the main concept

Scoring*:

Richardson and Dalton, 2016

Accurate & Complete (AC): 3 Points

Accurate & Incomplete (AI): 2 Points

Inaccurate & Complete (IC): 2 Points

Inaccurate & Incomplete (II): 1 Point

Absent (AB): 0 Points

Kong, 2009

Accurate & Complete (AC): 3 Points

Accurate & Incomplete (AI): 2 Point

Inaccurate (I, IC and II): 1 Point

Absent (AB): 0 Points

**To our knowledge, norms for AphasiaBank stimuli are only available for the Richardson & Dalton 2016 scoring system. If using the Kong, 2009 system, scores cannot be compared to the Richardson & Dalton, 2016 norms. See Kong et al., 2016 for main concepts, checklists, and norms for additional stimuli.*

Nicholas and Brookshire also developed a series of coding rules to assist in determining the accuracy and completeness of main concepts. These coding rules are now supplemented with the published checklists, which provide common alternatives produced for each main concept, since

there is variability in the syntax and vocabulary that could be used to produce a main concept. These alternative lists are not comprehensive, so it is possible that a client may produce an acceptable alternative that is not in the checklist.

Required Readings/Resources:

The following background readings and resources are needed to accurately and reliably implement main concept analysis:

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(1), 145-156.

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.

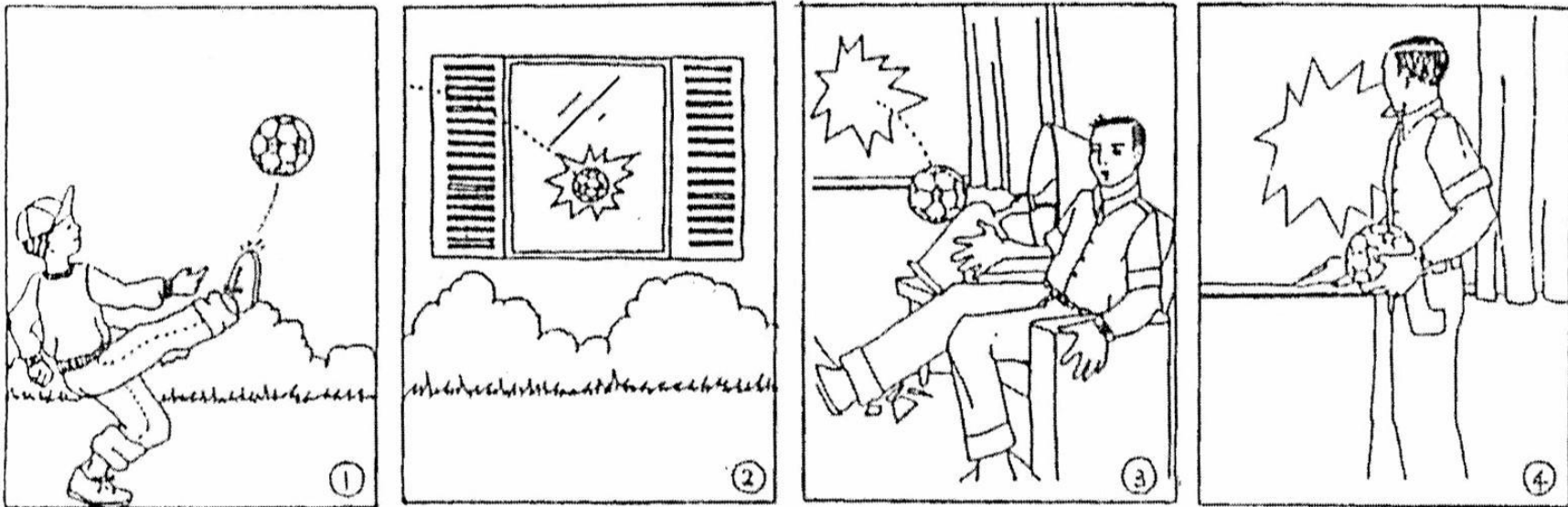
Richardson, J. D., & Dalton, S. G. H. (2020). Main concepts for two picture description tasks: an addition to Richardson and Dalton, 2016. *Aphasiology*, 34(1), 119-136.

Dalton, S. G. H., & Richardson, J. D. (2019). A large-scale comparison of main concept production between persons with aphasia and persons without brain injury. *American journal of speech-language pathology*, 28(1S), 293-320.

Richardson and Dalton Lab “Living” Rules for Determining Accuracy and Completeness of Main Concepts with Examples:

https://docs.google.com/document/d/1dx2aPGi6z_sPl1CCC0vbyNyVECwFRBLkHBXo9UrOWyg/edit?usp=sharing

Broken Window Picture Stimulus



Broken Window Main Concept Checklist

Essential information is *italicized* and **bolded**. Each essential segment is numbered (superscript) with alternative productions (if any were produced) listed by number below. These alternative productions ARE NOT intended to be an exhaustive list but represent some of the more common productions of the normative sample and are included to aid in scoring. Additional, but non-essential, information often spoken to complete the main concept is in normal font. If multiple utterances can correspond with an MC, select the best utterance presented for the purposes of coding/scoring.

1) ¹*A/The boy* ²*was* ³*outside.*

- a. *He, any name (e.g., Johnny, Mark)*
- b. *Is, decided to go*
- c. *In his yard, on the lawn, out of the house, etc.*

Note: Sometimes combined with MC2 in a statement such as “The boy was playing soccer outside” or “The boy was kicking the ball in the yard”. These statements would receive AC codes for MC1 and MC2.

2) ¹*A/The boy* ²*was playing* ³*soccer.*

- a. *See 1.1 above*
- b. *Plays, kicks, practices*
- c. *With the soccer ball, with the ball, with the football* (*if dialectically appropriate)*

Note: “He has a ball” or “He has a soccer ball” did not count towards this concept because it does not imply any kind of action with the soccer ball, and boy-action-ball was the concept that met criterion.

3) ¹*The ball* ²*breaks* ³*the man’s/neighbor’s window.*

- a. *Soccer ball, football* (see 2.3)*
- b. *Goes through, crashes through/into, flies through, sails through/into, shatters, is kicked through*
- c. *glass*

4) ¹*The man* ²*is sitting* in a chair and/or inside the house.

- a. *The dad, the father, the neighbor, the guy, any name*
- b. *Lounging, resting, relaxing, inside*

Note: Most common were “The man is sitting,” “The man is inside,” and “The man is sitting inside.”

Note: “The man is watching TV” or something similar did not count for this concept; that was a separate

5) ¹*The man* ²*was startled.*

- a. *See 4.1*
- b. *Surprised, amazed, afraid, astonished, freaked out, stunned, shocked, angry, upset, not happy, mad*

Note: Occasionally, this concept was combined with MC3 in a statement such as, “The ball crashed through the window and startled the man” or with MC4 in a statement such as “The man sitting there was startled” or “The startled man was sitting in the living room”.

6) ¹*The ball* ²*breaks* ³*a lamp.*

- a. *See 3.1*
- b. *Knocks down, knocks over, smashes into, hits*

7) ¹*The man* ²*picks up* ³*the ball.*

- a. *See 4.1*

b. Grabs, gets, holds, catches, captures, has

c. See 3.1

Note: Occasionally, “The man stands up with the ball” or “The man jumps up with the ball” were used to express this concept.

8) ¹The man ²looked ³out of the window.

a. See 4.1

b. Looks

c. Outside, out, out of the glass

Note: “The man goes to the window,” or “The man goes outside” do not count towards this concept. These were separate relevant concepts that did not meet criterion.

Nicholas & Brookshire Coding Rules with Examples from Richardson & Dalton

Accuracy

Wording

- The wording of essential information does not have to be the same as that of the listed main concept, but the general meaning must be the same.
- Some alternate versions of essential information in specific main concepts are given in parentheses in the main concept lists. There may be appropriate alternatives not listed.
- Figures of speech and colloquialisms are acceptable.
- Cookie Theft Example - For the main concept, "The woman is doing the dishes," the following statements would be considered accurate because they are plausible given the stimulus picture:
 - The mother is cleaning the dishes.
 - The maid is drying a plate.
 - The lady was washing her dishes.
- Broken Window Example – For main concept 4 “*¹The man ²is sitting* in a chair and/or inside the house”, the following statements would be considered accurate.
 - The father is relaxing in his recliner.
 - The neighbor is sitting in the living room.
 - The man is resting and watching TV.

Grammatical form and word order

- Essential information does not have to be spoken in standard grammatical form or standard word order, as long as deviations would not lead to miscomprehension of the essential meaning of the main concept.
- Cookie Theft Example - For the main concept, "The woman is doing the dishes," the following statements would be considered accurate:
 - Mother do dishes.
 - Lady drying some plate.
 - Woman dishes drying them.
- Broken Window Example – For the main concept 6 “*¹The ball ²breaks ³a lamp.*” the following statements would be considered accurate.
 - Ball break lamp
 - Ball lamp broken

Articulation

- Essential words do not have to be correctly articulated to be considered accurate, as long as they would be intelligible to a listener as the target words in the context of what the speaker is saying.
 - Assume that the listener has seen the stimulus picture.
- Broken Window Example
 - Concept 6: “*¹The ball ²breaks ³a lamp.*”
 - “knocked over a **lap** in the man’s house after going through the window”

- Accurate based off of Nicholas & Brookshire articulation rules and based on picture stimulus
- Concept 3: *¹The ball ²breaks ³the man's/neighbor's window.*
 - “And window ch bwoke”
 - “bwoke” can be understood clearly enough as to mean ‘broke’
- Concept 2: *¹A/The boy ²was playing ³soccer.*
 - “Dah boy bahlayed soccer”
 - Accurate based off of Nicholas & Brookshire articulation rules and based on picture stimulus

Inaccurate words in accurate main concepts

- If the essential information in a main concept is accurate, but inaccurate words also are included in the concept, consider the main concept accurate unless the inaccurate words alter essential information to make it inaccurate.
- Cookie Theft Example - If someone said, "The woman is drying the dishes with a bath towel," the concept would be considered accurate even though the woman is using a dish towel, because the essential information is accurate.
- Broken Window Example - For main concept 4 “*¹The man ²is sitting* in a chair and/or inside the house”, if someone said, "The man is sitting reading a newspaper," the concept would be considered accurate even though the man is not reading anything, because the essential information (bold and italicized “*¹The man ²is sitting*”) is accurate.

Effects of statement form on essential information

- The form in which a speaker chooses to state a main concept affects which information is considered essential.
- Cookie Theft Example - Someone describing how to do dishes can say the first main concept as "Put water in the sink," or "Run the water." If the speaker said, "Put water in the kitchen box," the main concept would be considered inaccurate, because the verb "put" requires a preposition and an object (which must be correct). However, if the speaker said, "Run the water in the kitchen box," the main concept would be considered accurate, because the verb "run" does not require a preposition and an object.
- Broken Window Example - Haven't actually seen an example of one of these

Inaccurate pronoun referents

- If a referent is inaccurate but a pronoun that refers to it is accurate, consider the statement with the pronoun accurate.
- Cookie Theft Example - If someone said, "The man is washing dishes. She is not paying attention to her kids," the first statement would be considered inaccurate but the second would be considered accurate.
- Broken Window Example - For main concept 7 “*¹The man ²picks up ³the ball.*” If someone said, "The woman picks up the ball. He looks out the window," the first statement would be considered inaccurate (due to “woman” instead of “man”) but the second would be considered accurate because the pronoun correctly refers to a male.

Restatement of essential information

- If essential information is stated one way and then restated, score the final version spoken.
- Cookie Theft Example - For example, if someone said, "The woman he is doing the dishes," the statement would be considered inaccurate. If the speaker said, "The man no woman is doing the dishes," the statement would be considered accurate.
- Broken Window Example - For example, for main concept 2 "¹*A/The boy* ²*was playing* ³*soccer.*", if someone said "The boy was playing baseball", the statement would be considered inaccurate. If the speaker said, "The boy is playing baseball, no, soccer," the statement would be considered accurate.

Completeness

Missing essential information

- If only some of the essential information (***bold italicized***) for a main concept is mentioned, either in its list form or in a form that has the same general meaning, consider the main concept incomplete.

Statements containing some of the essential information

- If a statement that is not listed as a main concept contains some of the essential information for a main concept, consider the main concept incomplete.
- Cookie Theft Example - For example, if someone said, "The woman is standing there," "woman" would be considered an incomplete main concept for "The woman is doing dishes." This would be the case as long as "woman" was not counted toward another main concept and the character has not been mentioned previously. Such statements serve to establish a character, element, or action in a story.
- Broken Window Examples
 - Concept 4: ¹***The man*** ²***is sitting*** in a chair and/or inside the house.
 - “And into a **man’s**,” - statement contains some accurate information but is not fully complete. Introduction of new character = AI
 - Concept 2: ¹***A/The boy*** ²***was playing*** ³***soccer***.
 - “It is a **ball**” - introduction of new main essential element (ball as alternative to soccer) = AI

Nonspecific words

- If nonspecific words are spoken in place of essential information, consider the main concept incomplete.
- Cookie Theft Example - For example, "The woman is washing that thing," would be considered an incomplete main concept.
 - *BUT* In some cases there may be legitimate uncertainty about a specific person or element in a picture (e.g., "Someone is fishing" [WAB Picnic Scene]). In such instances, the nonspecific word will appear on the main concept list and its use will not render the main concept incomplete.

Pronoun referents

- If the referent for a pronoun is ambiguous, consider the main concept that contains the ambiguous pronoun incomplete, but only for the first use of the pronoun for that referent
- Do not consider a main concept incomplete if there is no antecedent referent for a pronoun but the referent is clear from context/unambiguous.
 - For example, if there is only one "she" or "he" or "they" in a picture, or only one figure is completing a specific action, the pronoun would be unambiguous without an antecedent referent.
- Cookie Theft Example – For example, “He is about to fall” is unambiguous without a referent because the only male figure in the picture is the little boy standing on the stool.
- Broken Window Example
 - For main concept 4 “¹***The man*** ²***is sitting*** in a chair and/or inside the house.” The production “He is sitting inside” is unambiguous because there is only one person pictured inside the house.

Notes on Nicholas and Brookshire Rules

- Main concepts do not have to be spoken in the same order they are shown in the main concept list.
 - Broken Window Example
 - “*There is a little boy playing soccer, he’s outside in the yard*”
 - MC2 is produced first and should be coded as AC. MC1 is produced second and should also be coded as AC.
- If a main concept is spoken several times, ALWAYS score the final version.
 - Broken Window Example
 - “*The boy is playing soccer, practicing for the team try-outs, so he’s kicking the ball, and it goes right through the window*”
 - Both “*the boy is playing soccer*” and “*he’s kicking the ball*” apply to MC2. Since, “*he’s kicking the ball*” is produced later, that is the utterance that should be scored for MC2.
 - This is true even if the later utterance results in an error code, while the first utterance would receive an AC code.
- Essential elements for main concepts can be produced across multiple utterances.
 - Many different ways used to segment into utterances. Practicing clinicians may not have the time or training on specific segmenting approaches. If essential elements are produced within a reasonable distance within a string of words, regardless of where utterance boundaries may be placed, they can still count towards a single main concept.
 - Broken Window Example
 - MC8: *¹The man ²looked ³out of the window.*
 - Utterance 1: “*man gets up.*”
 - Utterance 2: “*mad mad mad.*”
 - Utterance 3: “*looks out the window.*”
- The verb tense used in the production should **not** impact the code received. Any inflected form of the verbs listed in the checklist should be allowed.
 - Broken Window Example
 - MC8: *¹The man ²looked ³out of the window.*
 - “*the man is looking outside*”
 - AC
 - “*so the man will go look out the glass to see who’s there*”
 - AC
 - “*the man looks out the window*”
 - AC
- One utterance can be used to produce two or more main concepts
 - Broken Window Example
 - MC7 (*¹The man ²picks up ³the ball.*) and MC8 (*¹The man ²looked ³out of the window.*)
 - “the man

Broken Window Scoring Examples

Broken Window

¹*A/The boy* ²*was playing* ³*soccer.*

AC **“boy was playing outside with a ball.”**

AI **“boy ball”**

- *No verb is produced.*

IC **“they kick this around”**

- *Clear pronoun referent for “this” from previous statement.*
- *Incorrect pronoun “they.”*

II **“and baseball or something”**

- *Incorrect noun use.*
- *No verb is produced.*

Taken from Appendix 4 of:

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.

Broken Window Scoring Sheet

	Essential Element 1	Essential Element 2	Essential Element 3	MC Code
MC1 Sometimes combined with MC2	<u>The boy</u> (he, any name)	<u>Is</u> (was, decided to go)	<u>Outside</u> (in his front yard, on the lawn, out of the house)	
MC2	<u>The boy</u> (he, any name)	<u>plays</u> (kicks, hits, practices) “has” is not acceptable	<u>Soccer</u> (with the soccer ball, with the ball, with the football*) *if dialectically appropriate	
MC3	<u>The ball</u> (soccer ball, football*)	<u>Breaks</u> (goes/crashes/flies/sails/is kicked through or into, shatters)	<u>The window</u> (the glass)	
MC4	<u>The man</u> (dad/father, neighbor, guy, any name)	<u>Is sitting</u> (lounging, resting, relaxing, is inside) but not “watching tv” alone		
MC5 Sometimes combined with MC3	<u>The man</u> (he, any name)	<u>Was startled</u> (surprised, amazed, afraid, astonished, freaked out, stunned, shocked, angry, upset, mad, not happy)		
MC6	<u>The ball</u> (soccer ball, football*)	<u>Broke</u> (hits, smashes, knocks down)	<u>A lamp</u>	
MC7	<u>The man</u> (he, any name)	<u>Picked up</u> (grabs, gets, holds, catches, captures, has)	<u>The ball</u> (soccer ball, football*)	
MC8	<u>The man</u> (he, any name)	<u>Looked</u>	<u>Out of the window</u> (outside, out, out of the glass)	

References

- Albright, E., & Purves, B. (2008). Exploring SentenceShaperTM: Treatment and augmentative possibilities. *Aphasiology*, 22(7-8), 741-752.
- Avent, J., & Austermann, S. (2003). Reciprocal scaffolding: A context for communication treatment in aphasia. *Aphasiology*, 17(4), 397-404.
- Coelho, C. A., McHugh, R. E., & Boyle, M. (2000). Semantic feature analysis as a treatment for aphasic dysnomia: A replication. *Aphasiology*, 14(2), 133-142.
- Cupit, J., Rochon, E., Leonard, C., & Laird, L. (2010). Social validation as a measure of improvement after aphasia treatment: Its usefulness and influencing factors. *Aphasiology*, 24(11), 1486-1500.
- Dalton, S. G. H., & Richardson, J. D. (2019). A large-scale comparison of main concept production between persons with aphasia and persons without brain injury. *American journal of speech-language pathology*, 28(1S), 293-320.
- Kong, A. P. H., Whiteside, J., & Bargmann, P. (2016). The Main Concept Analysis: Validation and sensitivity in differentiating discourse produced by unimpaired English speakers from individuals with aphasia and dementia of Alzheimer type. *Logopedics Phoniatrics Vocology*, 41(3), 129-141.
- 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(1), 145-156.
- 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.
- Richardson, J. D., & Dalton, S. G. H. (2020). Main concepts for two picture description tasks: an addition to Richardson and Dalton, 2016. *Aphasiology*, 34(1), 119-136.
- Ross, K. B., & Wertz, R. T. (1999). Comparison of impairment and disability measures for assessing severity of, and improvement in, aphasia. *Aphasiology*, 13, 113-124.
- Stark, J. A. (2010). Content analysis of the fairy tale Cinderella—A longitudinal single-case study of narrative production: “From rags to riches”. *Aphasiology*, 24(6-8), 709-724.