Comparison of Main Concept and Core Lexicon Productions between the Modern and Original Cookie Theft Stimuli in Healthy Control Participants

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Introduction

- Discourse analysis provides insights into functional communication abilities that standard assessments do not.
  - Main Concept Analysis and Core Lexicon are two measures that are clinically practicable and informative.[1,2]
- One of the most frequently used stimulus items to elicit discourse is the "Cookie Theft" image from the BDAE.[3]
  - Original image has been updated and edited to balance items on the left and right side of the image, reduce stereotypical representations of gender roles, and add color.[4]
- Given the rich history of research using the original Cookie Theft, development of main concept and core lexicon checklists are warranted.
  - Facilitate comparisons between historical and future research and allow clinicians and researchers to select the most appropriate stimulus.

Specific Aims:
1) Develop Main Concept Analysis and Core Lexicon checklists for the original and modern Cookie Theft stimuli using healthy control samples.
2) Identify differences in productions of discourse elicited by the two stimuli in healthy controls.

Methods

Transcripts
- 45 control transcripts of the original cookie theft stimulus from DementiaBank.
  - 17 Female, 28 Male; mean age: 62 yrs (46-80); mean education: 14 yrs (11-20)
- 48 control transcripts of the modern cookie theft stimulus from JHU
  - 35 Female, 15 Male; mean age: 60.5 yrs (20-89)

Elicitation Differences
- Original: "Look at the picture and tell me everything that you see going on in the picture."
- Modern: "describe everything that is happening in the picture (as though describing it for the blind), trying to use complete sentences."

Main Concept Development
- Followed process outlined in Richardson & Dalton, 2015.
- A list of all relevant concepts was created from the transcripts for each task.
- Then tallied how frequently relevant concepts were produced.
- Main Concepts were produced by ≥33% of the sample.

Core Lexicon Development
- Followed process outlined in Dalton & Richardson, 2015.
- Lists of all lemmas in each transcript were created.
- The frequency of occurrence of lemmas across transcripts was calculated.
- Any lemma that was produced by 50% or more of the sample was included as a core lexicon item.

Results

Main Concept
- 171 unique relevant concepts identified for the original Cookie Theft.
- 164 unique relevant concepts identified for the modern Cookie Theft.
- 9 and 14 main concepts identified for the original and modern stimuli, respectively (Table 1).
  - 6 shared; 3 specific to original Cookie Theft; 8 specific to modern Cookie Theft.

Core Lexicon Checklists
- 374 unique words produced for the original Cookie Theft.
- 712 unique words produced for the modern Cookie Theft.
- 26 and 41 core lexicon items for the original and modern stimuli, respectively (Figure 1).
  - 19 shared; 7 unique to original Cookie Theft; 21 unique to modern Cookie Theft.

Table 1. Main Concept checklists for the original and modern Cookie Theft stimuli.

	Original Cookie Theft Stimulus		Modern Cookie Theft Stimulus
MC1	The woman is doing the dishes	MC1	The father is washing the dishes
MC2	The water is overflowing in the sink	MC2	The sink is overflowing onto the floor
MC3	The mother is standing in the water		
		MC3	The mother is outside
		MC4	The mother is mowing the lawn
		MC5	She is on the phone
		MC6	She is mowing the flowers
		MC7	The cat is chasing birds
MC4	The boy is getting cookies out of the cookie jar	MC8	The little boy is getting cookies out of the cupboard
MC5	The boy is giving a cookie to the girl		
MC6	The boy is on the stool	MC9	He is standing on the stool
MC7	He is falling off / The stool is tipping over	MC10	He is falling off the stool
MC8	The little girl is reaching for a cookie	MC11	The little girl is eating a cookie
MC9	The girl has her finger to her mouth		
		MC12	The cookies are falling on the floor
		MC13	The dog is eating cookies
		MC14	There are other buildings outside

References
1. 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. *AJSLP*, 24(4), S923-S938.
2. 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. *AJSLP*, 28(1S), 293-320.
3. Goodglass, H., Kaplan, E., & Barresi, B. (2000). Boston Diagnostic Aphasia Examination-(BDAE-3).
4. Berube, S., Nonnemacher, J., Demsky, C., Glenn, S., Saxena, S., Wright, A., ... & Hillis, A. E. (2019). Stealing cookies in the twenty-first century: Measures of spoken narrative in healthy versus speakers with aphasia. *AJSLP*, 28(1S), 321-329.

Figure 1. CoreLex lists for the original and modern Cookie Theft stimuli, with overlapping vocabularies.
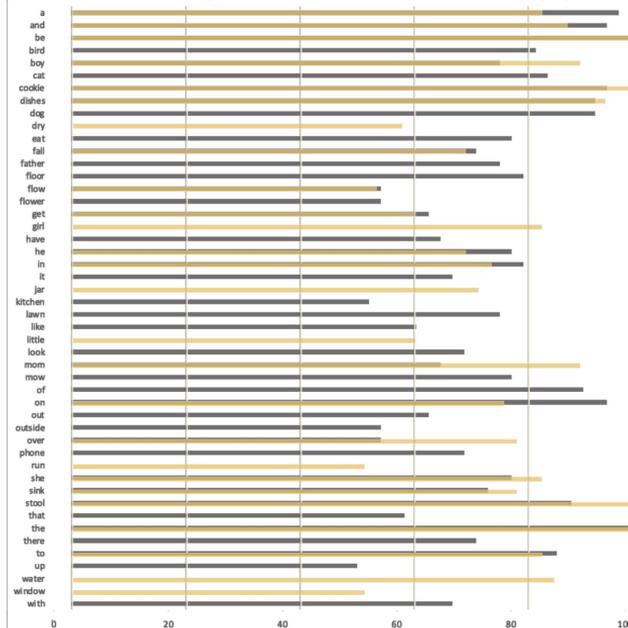
Discussion

- The two stimuli demonstrate overlapping and unique items for both MCA and CoreLex.
- The modern cookie theft stimulus has new characters and actions and is visually richer.
- The modern instruction seems to be effective in eliciting longer descriptions, made up of more main concepts and core lexical items.
  - This work again demonstrates that image complexity and task instructions impact task performance in a normative sample.
- Creation of MCA and CoreLex checklists for both cookie theft images will allow direct comparisons of performances across stimuli.
- Given the extensive use of the original cookie theft this will better situate future research within a historical framework.
- Future research should compare performance of PWA and other clinical populations on the two images to further advance clinical utility of these stimuli.