

Dementia: Effects on the Language Skills of Bilingual Speakers

Christopher Logan Durr, B.S.

Faculty Sponsor: Ethan Kristek, Ed.D., CCC-SLP

Fontbonne University - Department of Communication Disorders and Deaf Education

Abstract

Dementia is a type of condition that is generally characterized by any progressive decline in the brain's ability to function cognitively and linguistically, brought by either injury or disease. Around the world, roughly 55 million people, live with dementia, with an incidence rate of nearly 10 million per year. Some of the individuals affected by this condition are also bilingual speakers, who comprise about 43% of the global population (World Health Organization: WHO, 2023). Individuals who speak more than one language actively engage in code-switching, where they must alternate between languages. Because of this, speech-language pathologists and other allied health professionals need to know how to properly analyze assessment results for language characteristics seen in bilingual individuals with dementia. The following review will analyze common characteristics of the language in individuals with dementia and how to create an effective treatment from assessment findings.

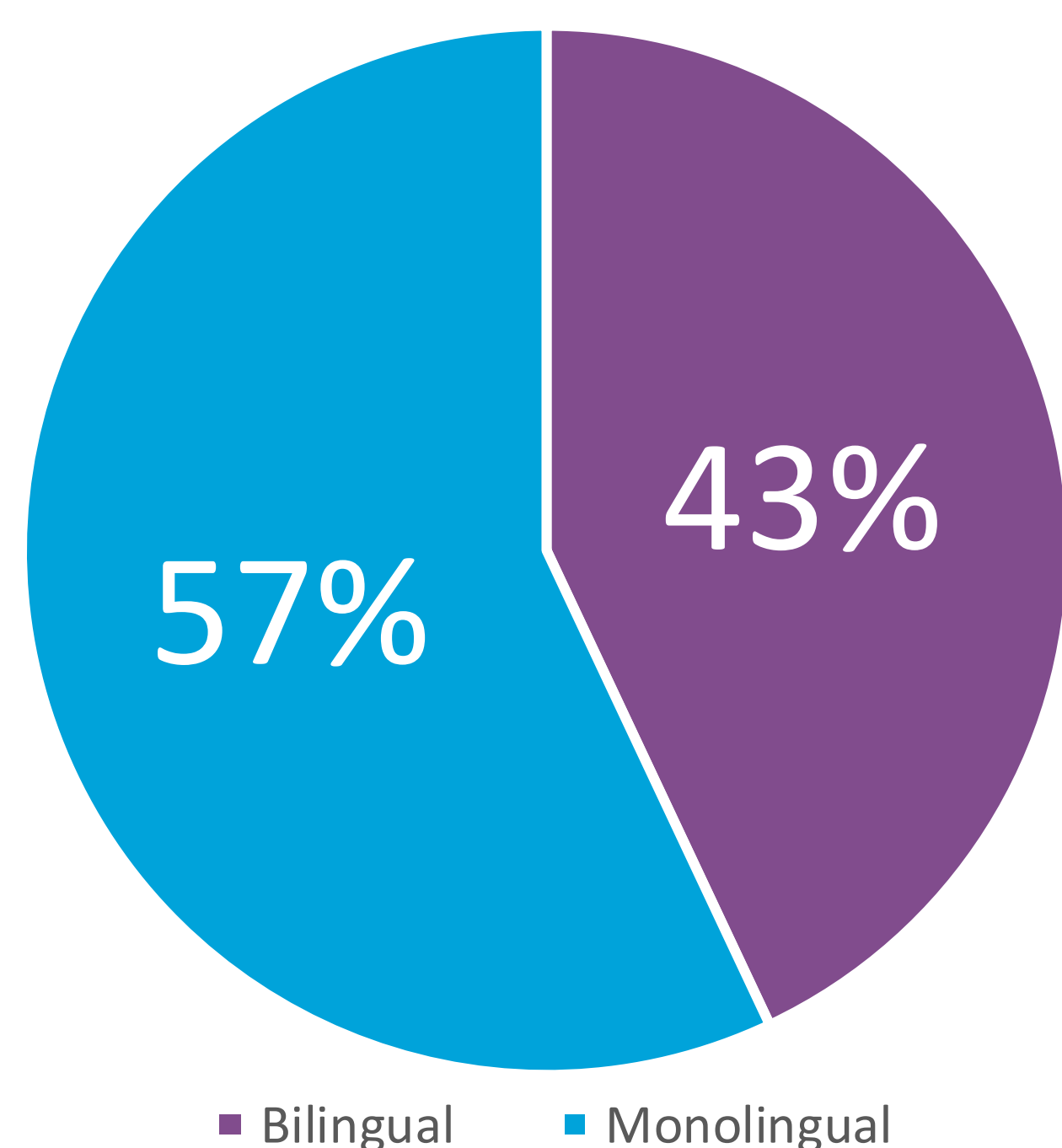
Learning Outcomes

- 1) Learners will be able to identify language characteristics that are associated with bilingual individuals with dementia.
- 2) Learners will be able to identify how to interpret diagnostic results for language characteristics that are associated with bilingual individuals with dementia.
- 3) Learners will be able to identify how to use their findings of language characteristics to develop an effective treatment plan for bilingual individuals with dementia.

Language Characteristics of Bilingual Individuals with Dementia

Fluency	Inhibition	Cognitive processing demands	Language comprehension
<ul style="list-style-type: none"> Fluency is a language characteristic associated with bilingual individuals with dementia, which refers to the ability to speak a language smoothly and without hesitation. Bilingual individuals with dementia may experience a decline in their fluency in both languages, which can be measured using language assessments. (Van Den Noort et al., 2019) 	<ul style="list-style-type: none"> Inhibition refers to the ability to suppress irrelevant information and control impulses, and bilingual individuals with dementia often experience difficulties in this area. Inhibition impairments may manifest as difficulty switching between languages, increased language errors, and difficulties in regulating behavior and emotions. (Van Den Noort et al., 2019) 	<ul style="list-style-type: none"> Cognitive processing demands refer to the cognitive resources required to switch between and inhibit languages in bilingual individuals with dementia. Bilingual individuals with dementia often have to work harder to manage language use due to interference from both languages, which can increase cognitive processing demands. (Van Den Noort et al., 2019) 	<ul style="list-style-type: none"> Language comprehension is a language characteristic that can be affected in bilingual individuals with dementia, where they may have difficulty understanding and processing language in both their first and second language. This can lead to communication difficulties and impact daily functioning, highlighting the importance of early diagnosis and tailored interventions for bilingual individuals with dementia. (Van Den Noort et al., 2019)

Bilingual and Monolingual speakers worldwide (2022)



Data Interpretation and Language Characteristics

- The data interpretation found the following for each highlighted language characteristic through the utilization of their respective assessments (Grossmann et al., 2021).

Controlled Oral Word Association Test (COWAT)

Fluency

- Difficulties in word retrieval
- Reduced verbal output
- Increase in hesitations and pauses during speech
- Score of 15 or below for individuals aged 60-69.

Stroop Test

Inhibition

- Difficulties in suppressing irrelevant information
- Slower reaction times
- Poor performance on tasks requiring inhibitory control
- Time taken to complete the test is significantly longer than the average completion time for the individual's age and education level.
- High number of errors made during the test.

Controlled Oral Word Association Test (COWAT)

Cognitive processing demands

- Difficulties in performing tasks that require high levels of attention.
- Difficulties in tasks with multiple steps or tasks with time constraints.
- Score of 15 or below for individuals aged 60-69.

Boston Naming Test (BNT)

Language comprehension

- Difficulties in understanding complex sentences.
- Difficulty in following instructions.
- Difficulty in comprehending abstract concepts.
- Score of 19 or below out of 30 for individuals aged 60-69.

Efficacious Treatment

Fluency treatment:

- Speech therapy can be used to improve word retrieval and increase verbal output. Additional interventions, such as memory aids and training in compensatory strategies, may also be helpful (Van Den Noort, Vermeire, et al., 2019)

Inhibition treatment:

- Cognitive training programs that focus on inhibitory control can be used to improve performance on tasks requiring suppression of irrelevant information. Additionally, interventions that promote relaxation and stress reduction may also be helpful (Van Den Noort, Vermeire, et al., 2019).

Cognitive processing demands treatment:

- Cognitive rehabilitation can be used to improve attention and executive functioning. Simplifying tasks and breaking them down into smaller steps can also be helpful (Van Den Noort, Vermeire, et al., 2019)

Language comprehension treatment:

- Speech therapy can be used to improve understanding of complex sentences and abstract concepts. Visual aids and memory aids may also be helpful in improving comprehension. Additionally, providing clear and concise instructions can be beneficial (Van Den Noort, Vermeire, et al., 2019)

Implications

In conclusion, the efficacious treatment plan and data interpretation of the language characteristics in bilingual individuals with dementia has important implications for speech-language pathologists. With this information, speech-language pathologists can tailor treatment plans to address specific language deficits and create a more effective therapy plan. Additionally, this data can be used to monitor progress and make adjustments as needed. Overall, this information is crucial in improving communication and quality of life for bilingual individuals with dementia (Bubbico et al., 2019). These results may have significant implications for public health and language education policies aimed at promoting cognitive health and well-being in aging populations.

Acknowledgements

- Bubbico, G., Chiacchiaretta, P., Parenti, M., di Marco, M., Panara, V., Sepede, G., Ferretti, A., & Perrucci, M. G. (2019). Effects of second language learning on the plastic aging brain: Functional connectivity, cognitive decline, and reorganization. *Frontiers in Neuroscience*. <https://doi.org/10.3389/fnins.2019.00423>
- Chertkow, H. MD, FRCP (C); Whitehead, V. MA; Phillips, N. PhD; Wolfson, C. PhD; Atherton, J. PhD; Bergman, H. MD. (2010). Multilingualism (but not always bilingualism) delays the onset of Alzheimer disease: Evidence from a bilingual community. *Alzheimer Disease & Associated Disorders*, 24(2), 118-125. DOI: 10.1097/WAD.0b013e3181ca1221
- Grundy, J. G., & Anderson, J. A. E. (2017). Commentary: The relationship of bilingualism compared to monolingualism to the risk of cognitive decline or dementia: A systematic review and meta-analysis. *Frontiers in Aging Neuroscience*. <https://doi.org/10.3389/fnagi.2017.00344>
- Grossmann, J. A., Koelsch, V. M., Merve, G. D., Aschenbrenner, S., Teichmann, B., & Meyer, P. (2021). Effects of foreign language learning on executive functions in healthy older adults: Study protocol for a randomized controlled trial. *BMC Geriatrics*, 21, 1-14. <https://doi.org/10.1186/s12877-021-02051-x>
- Van, d. N. M., Vermeire, K., Bosch, P., Staudte, H., Krajenbrink, T., Jaswetz, L., Struys, E., Yeo, S., Barisch, P., Perriard, B., Sook-Hyun, L., & Lim, S. (2019). A systematic review on the possible relationship between bilingualism, cognitive decline, and the onset of dementia. *Behavioral Sciences*, 9(7), 81.. <https://doi.org/10.3390/bs9070081>
- Van, d. N. M., Struys, E., & Bosch, P. (2019). Individual variation and the bilingual advantage—Factors that modulate the effect of bilingualism on cognitive control and cognitive reserve. *Behavioral Sciences*, 9(12), 120. <https://doi.org/10.3390/bs9120120>
- World Health Organization: WHO. (2023, March 15). *Dementia*. <https://www.who.int/news-room/factsheets/detail/dementia>

DEMENTIA WORLDWIDE & USA

