

Is Verbal Response Time Related to Naming Accuracy in Aging?

Eve Higby^{1,2,3}, JungMoon Hyun¹, Loraine K. Obler^{1,2,3}, Martin L. Albert^{2,3}, Dalia Cahana-Amity^{2,3}

1. The Graduate Center of the City University of New York, 2. Boston University School of Medicine, 3. VA Boston Healthcare system

Introduction

- Accuracy on lexical retrieval tasks such as picture naming has been shown to decline with age (Nicholas, Obler, Albert & Goodglass, 1985).
- A longitudinal study of naming abilities showed significant declines over time in the older participants (Au et al., 1995).
- Most picture naming studies in older adults do not look at speed of naming. However, speed of performance on motor tasks has also been shown to decline with age (Forstmann et al., 2011).
- One study that compared younger and older adult participants found differences in picture naming latencies (Morrison, Hirsh, and Duggan, 2003).
- A recent study by Verhaegen and Poncelet (2013) found differences in speed of picture naming between adults 50-69 years of age and those 70 and older.

Research Questions

- Does performance by older adults on picture naming tasks decline with age for both accuracy and speed?
- Do participants over the age of 70 perform significantly slower than participants between 50-69? (Replication of Verhaegen & Poncelet, 2013)
- What is the relationship between speed and accuracy on these naming tests?
- Does speed of motor response significantly affect speed of picture naming?
- Is the relationship between age group and speed different for items with the lowest accuracy versus those with the highest accuracy?

Participants

- We tested 321 adults aged 51-89 years (mean: 71.7 years).

Age groups	51-59	60-69	70-79	80-89
N	38	78	147	58
Gender	12m; 26f	31m; 47f	84m; 63f	34m; 24f
Education (mean, years)	14.8	14.9	15.4	15.2

Method

Boston Naming Test (BNT)

- 60 black-and-white line drawings of objects
- Participants name each picture only once
- Performance scored for accuracy and RT

Action Naming Test (ANT)

- 57 black-and-white line drawings of actions
- Participants name each picture only once
- Performance scored for accuracy and RT

Motor response task

- Participants respond to a stimulus as quickly as possible by pressing a button
- Performance scored for RT

Statistical analysis

-Linear regression analyses were conducted for all relationships.

First, a whole group regression was calculated, and then separate regression lines were calculated for each of the age groups.

- One-way ANOVA was used to compare group means.

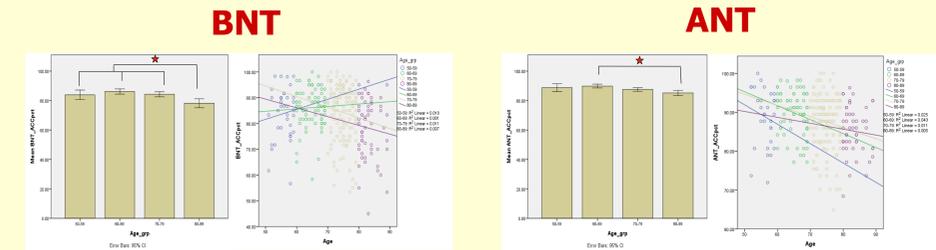
- All analyses controlled for the effects of gender and education.

Email for communication: ghigby@gc.cuny.edu

Results

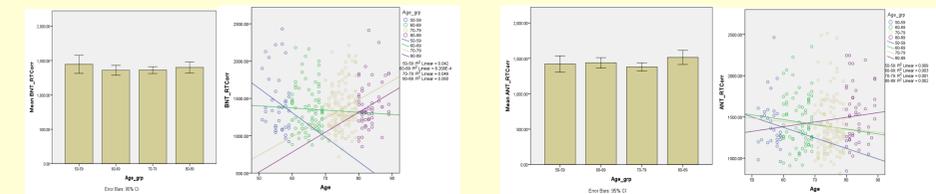
Age and accuracy

Age significantly predicts accuracy on both the BNT and ANT in a negative direction.



Age and response times (RT)

Age does not predict response times on either of the tests.

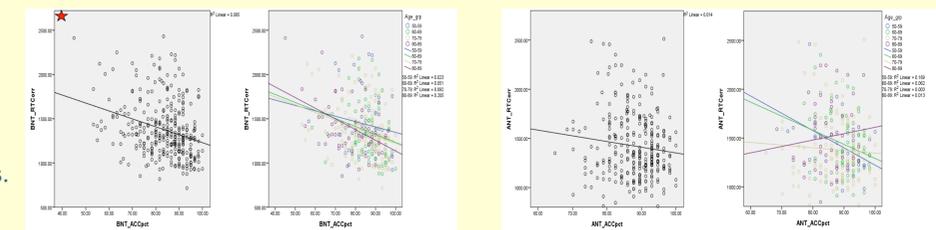


Accuracy and response times

There is a significant correlation between accuracy and response times on the BNT, but not on the ANT.

On the BNT, accuracy and RT is significantly correlated only for the 70-79 and 80-89 groups.

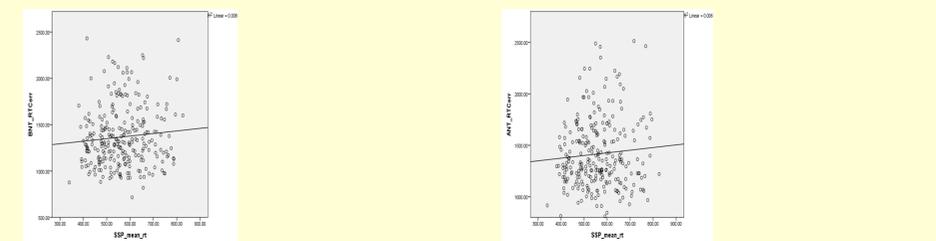
On the ANT, accuracy and RT is significantly correlated only for the 50-59 and 60-69 group.



Response times for naming and motor task

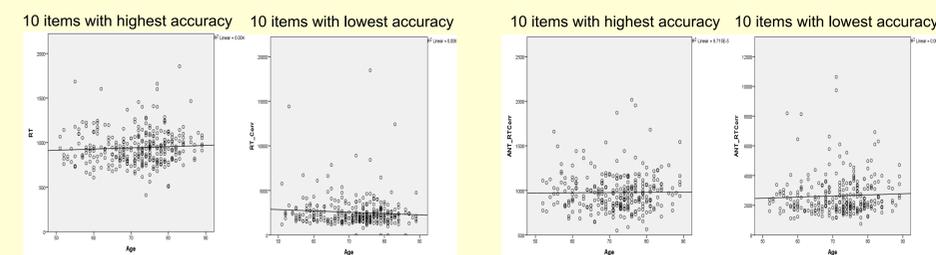
There was no correlation between response times on the BNT and the baseline motor response task or between the ANT and the baseline.

Adding baseline response times did not improve the regression model for age as a predictor of RT on either test.



Highest and Lowest Accuracy Items

Within the 20 test items with the lowest and highest accuracy, there was no relationship between age and RT on either test.



In Sum

- Accuracy for both object and action picture naming declines with age. The 80-89 age group performed significantly worse than the rest on the BNT and significantly worse than the 60-69 group on the ANT.
- Response time for naming does not decline with age, nor are there any differences between age groups.
- Verbal response time for naming appears to be independent of motor response times.
- Items at the highest and lowest ends with regard to accuracy showed the same non-significant relationship between age and response times.
- Unlike what was found in Verhaegen & Poncelet (2013), we did not observe an increase in response times for the 70-79 or the 80-89 group.

Acknowledgments

This project was supported in part by the Clinical Science Research and Development Service, US Department of Veterans Affairs, by Grant 5RO1AG014345-12 (PIs: Martin L. Albert & Loraine K. Obler) from the National Institute on Aging.