

AGE-RELATED DIFFERENCES IN IMPLICIT LEARNING OF HIGHER-ORDER REGULARITIES WHEN AGE GROUPS ARE MATCHED ON OVERALL ACCURACY

Selam Negash,¹ James H. Howard, Jr. ^{2,3}, Michelle R. Harris ², Laura C. Romain ², Douglas R. MacLeod ², & Darlene V. Howard ²

¹Mayo Clinic Rochester ²Georgetown University & ³The Catholic University of America

Abstract

Research on the aging of implicit sequence learning suggests there are age deficits in learning of higher-order sequential patterns (Howard & Howard, 1997). The extent to which the observed deficits are due to performance differences in accuracy, however, is not clear, as the age groups in earlier studies were not equated on overall accuracy. The present experiment investigated whether age deficits in learning higher-order regularities still persist even after young and old groups are matched on overall accuracy. 24 young and 24 older adults were tested on a variation of an Alternating Serial Reaction Time (ASRT) task, in which a 3-item pattern alternated with random trials (e.g., 1r2r3r). Learning was measured by the difference in performance between pattern and random trials (trial-type effect) on response time and accuracy. The age groups were matched on overall accuracy by modifying the end-of-block feedback of the ASRT task for the old group so that it only displayed their speed information, withholding their accuracy information. Results indicated that while both age groups were able to learn the 3-element ASRT pattern, there were age deficits in the magnitude of learning in that younger people revealed greater trial type effects than did older people. These findings suggest that the age deficits observed in earlier studies were not due to age differences in overall accuracy, but reflect a true deficit in learning higher-order regularities, consistent with context processing and simultaneity theories of aging.

Goals

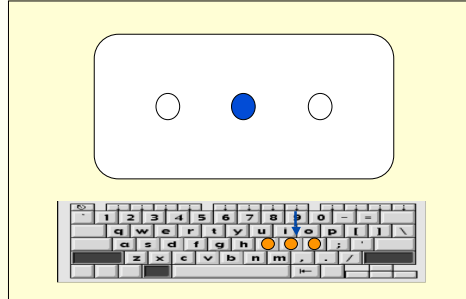
- To investigate age-related differences in implicit learning of short and higher-order regularities
- To determine whether age deficits in learning higher-order regularities occur even when the age groups are matched on overall accuracy
- To determine whether such learning occurs without ability to develop declarative knowledge about the pattern.

Participants

	Young	Elderly
Gender	15F, 9M	13F, 11M
Age	20.8 (1.4)	72.4 (6.1)
Education	14.7 (1.0)	17.5 (2.9)
Self-rated health	4.6 (0.56)	4.3 (0.70)

Note: Standard deviations in parentheses

Serial Reaction Time Task

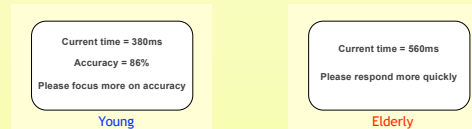


Procedure

- 3-element ASRT Task
- Pattern trials alternate with Random trials (e.g., 1-r-2-r-3-r)
- 1 block = 70 trials (6-item sequence repeated 10 times; 10 random warm-up trials)
- 2 sessions, 4 epochs/session = 8 epochs; 1 epoch = 5 blocks

End-of-Block Feedback:

Accuracy feedback removed for the old group to encourage speed



Measure of learning:

Trial-Type Effect: difference in performance between pattern and random trials on RT and accuracy measures.

Explicit measures: Verbal reports, Card Sorting task, and Recognition task.

Results #1:

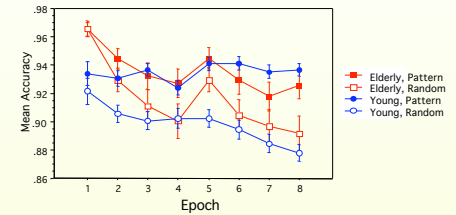
Age Groups Were Matched on Overall Accuracy

	Young	Elderly
Overall Accuracy	92 (.070)	92 (.100)

Note: Standard deviations in parentheses

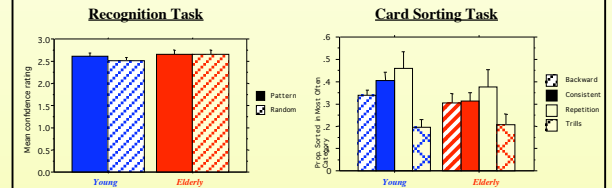
Results #2:

Age Deficits were Observed in Pattern Learning



Results #3:

Pattern Learning Occurred Without Awareness



Conclusions

- The learning was implicit in that no one was able to describe the pattern accurately or discriminate between pattern and random trials
- Age deficits in learning short and higher-order regularities occurred even when the age groups were equated on overall accuracy
- > These findings implicate a true deficit in learning higher-order regularities, consistent with context processing and simultaneity theories of aging.

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email: negash.selamawit@mayo.edu

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