

Assessing Internet Cognition

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Introduction

The Internet continues to grow in its influence of how individuals access and use information in their everyday problem solving. To date, little research exists on whether ability to find and process information on the Internet may be affected by individual thinking and information processing, a construct we call "Internet cognition".

We hypothesize that successful navigation of the Internet requires:

- 1) The ability to read and understand text.
- 2) Cognitive processing skills such as ability to organize information.

Internet Assessment

Internet Functionality Test (IFT)

Assesses the students' ability to find information online. The IFT asks students to use the Internet however they want to find the answers to questions. These have been selected such that participants will likely not know the answers without searching. Two versions of the test were created:

Trivia: In the trivia assessment, questions focused on general knowledge (see examples 1 and 2).

Health: In the health version, questions focused on medical knowledge (see examples 3 and 4).

Performance on each item was assessed in three ways, each reflecting a different level of cognitive processing:

1) Accuracy: whether the correct answer was found.

2) Efficiency: the amount of time to find the answer.

3) Quality: the Google PageRank of visited websites. *Google PageRank is a general index (0-10) of importance and interconnectedness of websites, with a higher number indicating a more interconnected and more important website.*

Measurement Properties

For the **Trivia** sample, item-total correlations were moderate to strong in terms of overall accuracy (r ranged from .23 - .76), and overall quality (r ranged from .52 - .90).

For the **Health** sample, item-total correlations for accuracy were low, indicating the scale needs revision (r ranged from .01-.25).

How fast can you do it?

IFT Example Questions:

1. What was the original name of the band "The Temptations"?
2. How old was Thomas Edison when he died?
3. What part of the eye is affected by cataracts?
4. How many stages of renal disease are there?

Figure 1: IFT Trivia Results

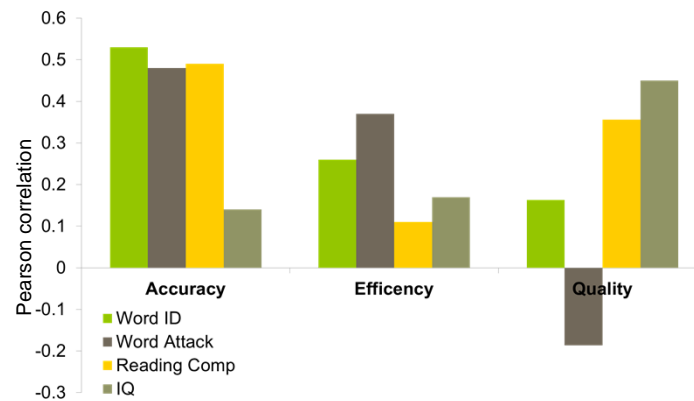
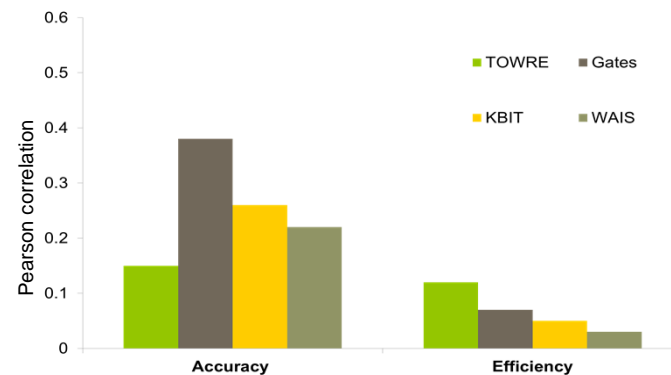


Figure 2: IFT Health Results



Samples

The two types of IFT tests were given to two different samples of participants.

IFT Trivia Sample: $n = 20$ participants, $M = 13$ years. Recruited through their participation in a larger research study

IFT Health Sample: $n = 86$ participants, $M = 20.12$ years. Recruited through the FSU undergraduate research population

Other Assessments

In line with our hypotheses, assessments of reading, comprehension, and cognitive processing were also administered, but differed slightly between the two samples:

IFT Trivia Sample:

1. Reading text: The Word Identification and Word Attack subtests of the Woodcock Johnson require participants to read words and non-words for accuracy.
2. Text comprehension: The reading comprehension subtest of Woodcock Johnson requires participants to read a passage and answer corresponding questions.
3. Cognitive processing: Stanford-Binet short form IQ scale.

IFT Health Sample:

1. Reading text: Tests of Word Reading Efficiency (TOWRE), real word efficiency. Students had to read lists of real words as fast as they could for 45sec.
2. Text comprehension: Gates-MacGinitie Reading Comprehension test (Gates) for Adults. Students had 35min to read short passages and answer multiple choices questions based on the text.
3. Cognitive processing: Kaufman Brief Intelligence Test, Second Edition (KBIT) Matrices subtest, and the WAIS digit span backwards.

Conclusions

These findings suggest that individual differences in Internet cognition do exist, and that they can be reliably assessed, particularly in children. We suggest that future studies should expand on the idea of Internet cognition, especially whether it is a skill that can be easily taught.

We sought to expand our initial results from the IFT Trivia test to adults and particularly towards how adults interact with health related information online. There is a push towards a better understanding of what is termed "health literacy" (e.g., NIH RFA), and we wanted to explore if Internet cognition was related to health literacy.