



Simple Technology – Better Decisions: Interpretation of the Home HIV Test

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Abstract

This research investigated the relationships between **risk literacy**, **understanding** of diagnostic testing statistics, and **recommendations** for behaviors after a positive result with the home HIV test. Participants responded while viewing manipulations of the individualized **educational materials** for young adults. We found that a **decision aid** can increase understanding of conditional risk. Additionally, the relationships between risk literacy and decision making are mediated by overall understanding of diagnostic testing statistics.

Aims

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- Improve understanding of diagnostic testing statistics, especially understanding of the positive predictive value.
- Increase recommendations for re-testing.
- Model theoretically relevant individual differences that predict differences in understanding of diagnostic testing statistics and decision making.

Methods

Participants

- 514 participants: recruited with mTurk
- Ages ranged from 18 to 77 ($M = 37.58$, $SD = 13.08$)
- 66.9% female, 32.9% male
- Received monetary compensation
- Read a scenario and responded to individual difference, performance, and recommendation measures.

Methods

Measures

Risk literacy

- Berlin Numeracy Test (Cokely et al., 2012)
- Three-item Numeracy Test (Schwartz et al., 1997)

Diagnostic Test Statistic Understanding

- **Prevalence:** The likelihood of HIV for a given risk group.
- **Sensitivity:** The probability that a test result will be positive for a disease among individuals with the disease.
- **Specificity:** The probability that a test result will be negative for a disease among individuals without the disease.
- **Negative Predictive Value (NPV):** The likelihood that an individual does not have a disease given they received a negative test result for that disease.
- **Positive Predictive Value (PPV):** The likelihood that an individual does have a disease given they received a positive test result for that disease.

Recommendations for Behaviors

Manipulations: Home HIV Test Excerpt

- Original Brochure Information (Control)
- Control + Prevalence Statistic
- Control + Decision Aid
- Control + Re-test Statement
- Control + Decision Aid + Re-test

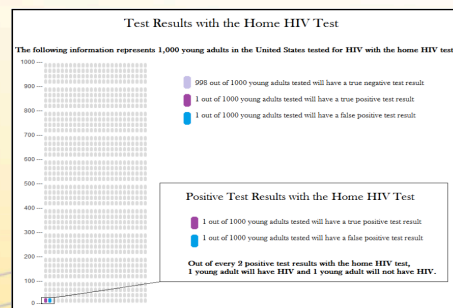


Figure 1. The decision aid was added to educational materials and increased understanding of the PPV.

Results

A Decision Aid Can Increase Understanding of Diagnostic Testing Statistics

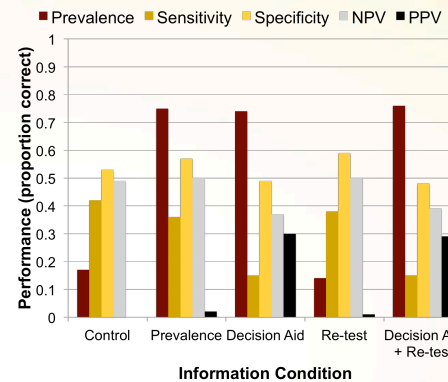


Figure 2. Main effect of decision aid on understanding of diagnostic testing statistics

Decision Aid x PPV Understanding Interaction on Recommendations for Dangerous Behaviors

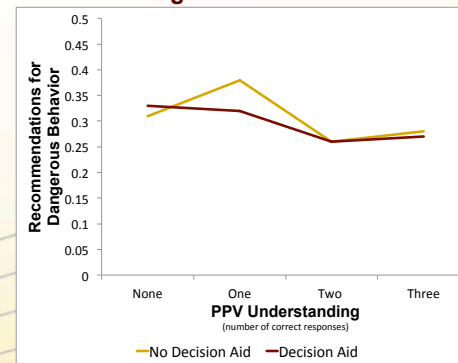


Figure 3. The influence of the decision aid on recommendations for risky behavior depended on understanding of the PPV. The decision aid reduced recommendations for dangerous behavior in individuals with lower understanding of the PPV.

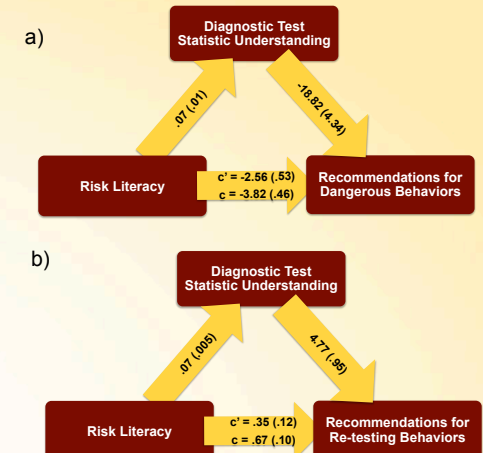


Figure 4. Diagnostic test statistic understanding partially mediated the relationships between risk literacy and (a) recommendations for dangerous behaviors and (b) recommendations for re-testing. The unstandardized path coefficients are displayed with standard errors in parentheses.

Conclusions

- A decision aid can increase understanding and reduce recommendations for dangerous behaviors after false positive tests.
- A decision aid increases understanding of most diagnostic testing statistics.
- The decision aid reduced recommendations for dangerous behavior in individuals with lower understanding of the PPV.
- Risk literacy and understanding predict recommendations for decision making after a positive result with a home test.

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