Impact of using a next button in a web-based health survey on time to complete and reliability of measurement

Ron D. Hays

(Rita Bode, Nan Rothrock, William Riley, David Cella, Richard Gershon)

October 2, 2009, 12-1pm

http://twitter.com/RonDHays

http://gim.med.ucla.edu/FacultyPages/Hays/

http://www.nihpromis.org/

RFA-RM-04-011

- Patient-reported outcomes measurement information system (PROMIS) project produced:
 - Item banks measuring patient-reported outcomes
 - Computer-adaptive testing (CAT) system
 - Publicly available
 - Clinicians and researchers

PROMIS Banks (454 items)

http://www.assessmentcenter.net/ac1/

- Emotional Distress
 - Depression (28)
 - Anxiety (29)
 - Anger (29)
- Physical Function (124)
- Pain
 - Behavior (39)
 - Impact (41)
- Fatigue (95)
- Satisfaction with Participation in Discretionary Social Activities (12)
- Satisfaction with Participation in Social Roles (14)
- Sleep Disturbance (27)
- Wake Disturbance (16)

SE and Reliability

- For z-scores (mean = 0 and SD = 1):
 - -Reliability = 1 SE²
 - = 0.91 (when SE = 0.30)
 - = 0.90 (when SE = 0.32)
- With 0.90 reliability
 - 95% Confidence Interval
 - z-score: -0.62 → 0.62
 - T-score: $44 \rightarrow 56$

T-scores = (z-score * 10) + 50

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POLL:NGPOINT

In general, would you say your health is:

O Excellent

O Very good

 \mathbb{O} Good

O Fair

O Poor



Study Aims

- Examine effects of:
 - Requiring (versus not) selecting Next button after responding to an item
 - Allowing (versus not) going back after each response to review or change it
 - on:
 - Time to respond to items
 - Number of missing responses
 - Reliability
 - Score on domain tested

Study Design

Four experimental conditions

- 1) Automatic advance, not allowed to go back > Auto/No back
- 2) Automatic advance, allowed to go back > Auto/Back
- 3) Next after response, not allowed to go back > Next/No back
- 4) Next after response, allowed to go back - > Next/Back



Study Sample

- 807 participants in Polimetrix PollingPlace registry
 - Average age: 53 (range: 18-88)
 - 64% female
 - 87% White; 7% Hispanic; 3% African American, 3% Native American
 - Education Level: 2% less than HS grad; 18% HS Grad; 44% some college; 37% college+
- Age, gender, race/ethnicity and education did not differ by experimental condition.

Demographics by Group

	Auto/No	Auto/Back	Next/No	Next/Back
% Female	63	65	64	63
% White	89	92	94	91
% Hispanic	7	6	6	2
% College	77	82	83	82
Age (mean)	56	52	57	57

Sample purification

- Identified respondents whose response times were unreasonably fast
 - Deleted 18 respondents in the Auto/No back group who took an average of less than 2 seconds to answer the items
- To compensate for these deletions
 - Deleted the 18 respondents in each of the other groups with the fastest time per item
 - 10 in Auto/Back, 2 in Next/No Back, and 1 in Next/Back groups had <2 seconds/item response

Performance of social/role activities (56 items)

- Items administered using 5-point frequency scale:
 - Never, rarely, sometimes, often, always
 - "I am limited in doing my work (include work at home)"
 - "I am able to do all of my regular family activities"
 - "I am able to do all of my regular leisure

Satisfaction with social/role activities (56 items)

- Items rated on a 5-point extent scale:
 - Not at all, a little bit, somewhat, quite a bit, very much
 - "I am happy with how much I do for my family."
 - "I am satisfied with my ability to work (include work at home)."
 - "I am satisfied with my current level of social

Differences between groups

- Time to respond to items
- Number of missing items
- Internal consistency reliability
- Mean domain scores

Significant differences in time spent were found

- Automatic advance
 - With no back button, 13 items per minute answered
 - With back button, 12 items per minute
- When required to use the Next button
 - With no back button, answered 9 items per minute
 - With back button, 8 items per minute

Missing data and reliability did not differ by group

	Auto/No	Auto/Back	Next/No	Next/Back
Soc./Role Performance	0.63	1.23	1.60	1.01
Soc./Role Satisfaction	1.00	0.87	1.51	1.13

* Internal consistency reliability estimates were all 0.99.

* There were <u>no</u> significant differences in mean domain scores across groups.

Recommendations

- Use of automatic advance rather than Next button
 - Especially helpful for persons with physical limitations that could make fine motor control more difficult
- Use of back button
 - Guard against accidental key entry
 - Response time cost was minimal
 - No effect on scores or missing responses

Caveats

- Use of Next button has advantage of making it easier to skip items
 - Need "prefer not to answer" choice if using automatic advance
- Automatic advance doesn't work for "select all that apply" items
- In CAT, allowing persons to go back to prior item is trickier

Acknowledgements

- PROMIS I is a U.S. National Institutes of Health (NIH) Roadmap initiative funded by cooperative agreements to a Statistical Coordinating Center (David Cella, PI, U01AR52177) and 6 primary research sites (late 2004 until 2009).
- PROMIS II has 12 primary research sites including
 - Development and Initial Validation of PROMIS GI Distress Scale
 - Dinesh Khanna and Brennan Spiegel, Pls

Thank you!



HEALTH SERVICES RESEARCH SEMINAR SERIES

UCLA Division of General Internal Medicine & Health Services Research presents:

Ron Hays, Ph.D.

Professor of Medicine and Health Services

"Impact of using a Next Button in a Web-based Health Survey on time to Complete and Reliability of Measurement"

Friday, October 2nd, 2009 - 12:00 p.m. - 1:00 p.m.

911 Broxton Plaza, Room 214 Lunch Provided