Statistical Work Group
Who we are and What we plan to do

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OREGON
HEALTH & SCIENCE
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Statistical Work Group

Formed upon request from the UDS NP work group

<alphabetical order>

Hiroko Dodge (OHSU & UDS Neuropsychology Work Group)
Steve Edland (UCSD)
Richard Kryscio (Kentucky)
Danping Liu (NACC)
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Dan Mungas (UC-Davis & UDS Neuropsychology Work Group)
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Zheyu Wang (NACC)
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Our Mission

To come up with **"suggestions and options"** so that CTF/NACC can make a well-informed decision.

Topic to be covered include:

@ What types of reliability/validity

@ How to collect the validation data

@ Implementation process

@ Budget (related with validation data collection)

@ How to harmonize old/new tests so that we can conduct seamless longitudinal analyses without wasting the data already collected

Plan

(Unless someone asks to hurry up...)

- Plan to have a conference call once per month
- e-mail exchanges between the calls

What types of reliability/validity

- *Potential* new tests (**all are non-proprietary**)

  1. Digit Span F/B from the Philadelphia Brief Assessment of Cognition (PBAC) [working memory]

  2. Craft stories [episodic memory]

  3. Face-name test [episodic memory]

  4. MoCA [dementia severity]

  5. MINT [naming]

  6. Benson Complex Figure Copy/Delayed [visual processing/memory]

Note

- Tests to be kept (all are non-proprietary)
    1. Trail A [processing speed]
    2. Trail B [executive function]
    3. Category fluency Animals and Vegetables [semantic language]

What types of reliability/validity

- **Validities**
    1. **Test-retest reliability (could be skipped?)**
    2. **Inter-rater reliability   (could be skipped?)**
    3. **Criteria related validity (normal, MCI, AD)**
    4. **Convergent validity (scores behave similarly to current measures)**

Things to consider

- AD: limit to early stage AD? if so what is the best operational criteria?

- Test-retest: interval between two assessments

- Criterion related validity (consider biomarkers?)

How to collect validation data

A. *Each center administers one new test in addition to current UDS to minimize participants' burden (?)*

   Pros: lower burden to participants

   Cons: administratively difficult to manage different tests (i.e., forms) to different centers

   Subjects' characteristics (cognitive) could differ by centers

B. *Each center administers current UDS "AND" all 5 new tests (craft stories, face-name test, MoCA, Benson Complex figures, MINT) to small # of subjects (N to be determined statistically)*

A different implementation approach

- ***Administer current battery to the current cohort, use new battery to initial participants (?)***

    Pros: Seamless longitudinal analysis

    Cons: Administratively difficult

    Takes too long to fully convert to new battery (?)

How to collect validation data

Potential factors we need to consider when we collect validation data (balancing factors)

> Sex
>
> Age (<80, >=80)
>
> DX (normal, MCI, early AD)
>
> Education (< high school ed vs. >=high school)
>
> Race/Ethnicity (Spanish?/Chinese?)
>
> Geography

Spanish version needs to be developed/validated separately (could take time)

Upload validation data (with UDS) to NACC vs. Use spread sheet from each center

Issues related to *harmonization* (conversion) analysis

AIM: to allow seamless continuous analysis without wasting data collected already

✓ Presentations this afternoon: 2 potential approaches

@Multiple Imputation

@IRT

Issues related to *harmonization* (conversion) analysis

✓ Current NACC participants: ***majority is follow-up (e.g., in 2010, only 20% was initial visit, the rest was follow-up visit)***

1. Need to consider ***practice effects*** in the current tests when we estimate conversion equations?

   @We need to limit to validation analysis to initial visits?

   @Taking into account duration of follow-up in the conversion equation?

2. Some tests require item by item data instead of total score---e.g., item scores in MMSE

3. Consider "fatigue effects": half ---conduct old test first, half---conduct new test first to eliminate the effect of fatigue on test scores

Issues related to *harmonization* (conversion) analysis

- ✓ Sensitivity analyses (whether conversions using different approaches come up with the similar results)

- ✓ Down the road….
  Changes in scores over time—how useful changes in scores are in predicting the conversion/stability of cognitive states

Thank you!

Comments/Inquires:

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