

# Different Methods for Capturing PROs

Susan Vitale, PhD, MHS

Division of Epidemiology and Clinical Applications

National Eye Institute, NIH

# Financial Disclosures

NO FINANCIAL RELATIONSHIPS TO  
DISCLOSE

Advances in  
technology and  
methodology  
have created  
more ways to  
assess PROs



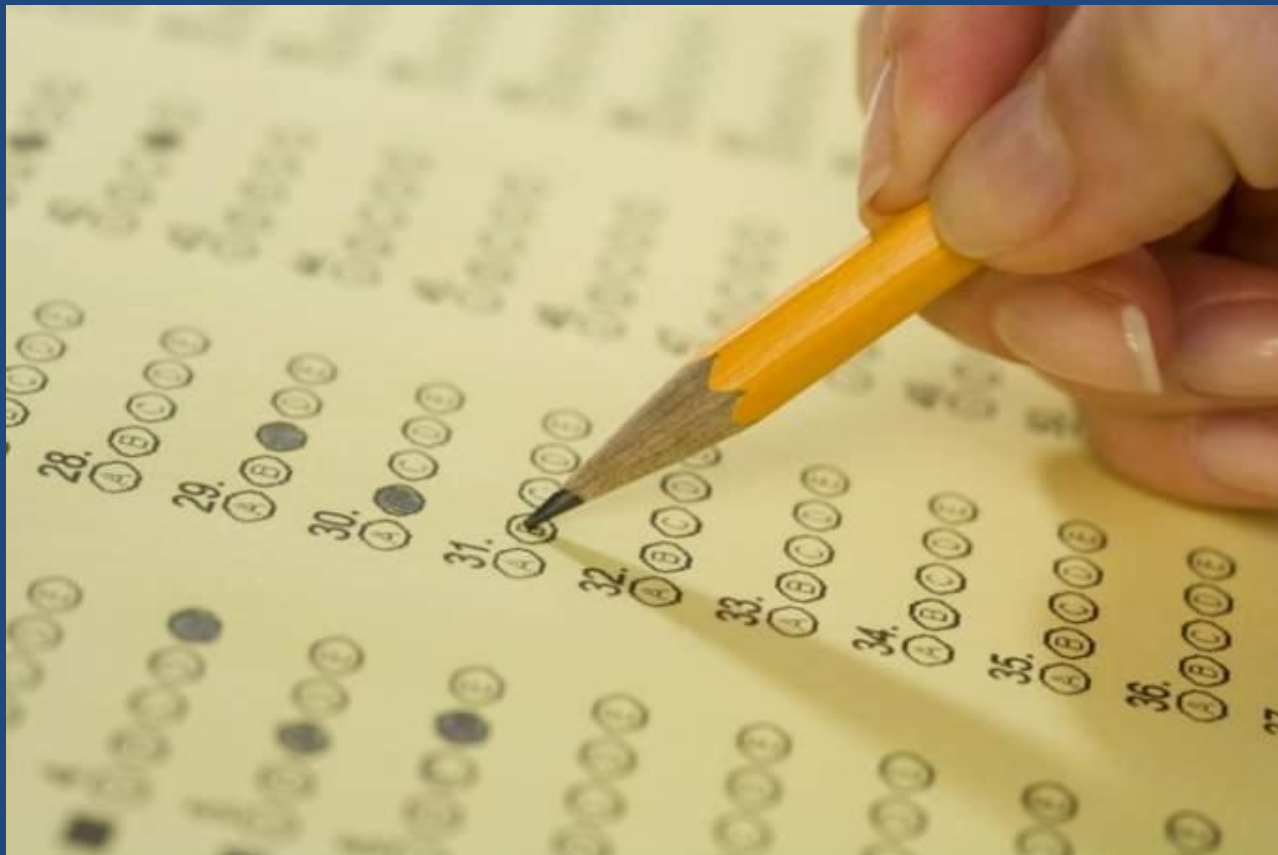
# Overview of talk

- Mode of administration (paper, electronic)
- Traditional development versus IRT-based techniques
- CAT/Promis brings together these two threads



# Modes of administration

## Paper



# Disadvantages of paper questionnaires

Skipped pages

Need data  
entry

Bulk/storage



# Modes of administration

## Electronic



# Drawbacks of electronic questionnaires

Identity



Comfort with computers



Internet access



# Particular advantages of ePROs for visual conditions

Presenting images of visual aberrations



Adjusting formatting



# Recent studies of ePROs in ophthalmology

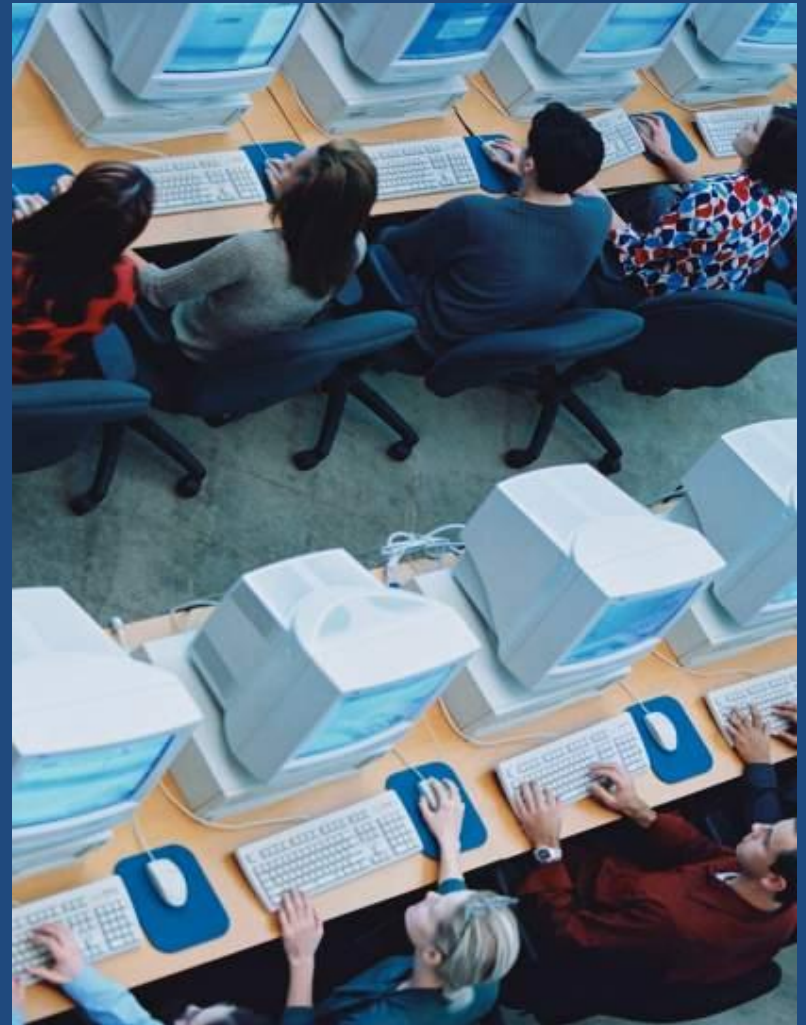
Clayton et al, 2013

OSD patients and controls

Web vs paper-based

NEI-VFQ, OSDI, NEI-RECQ

Most subscales equivalent, regardless of mode of administration



# Recent studies of ePROs in ophthalmology

Ünver, Yavuz, and Sinclair, 2009

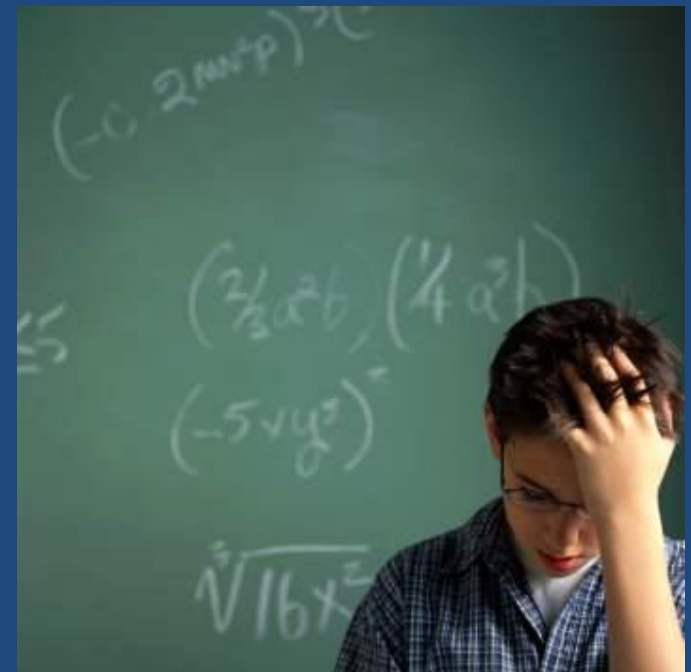
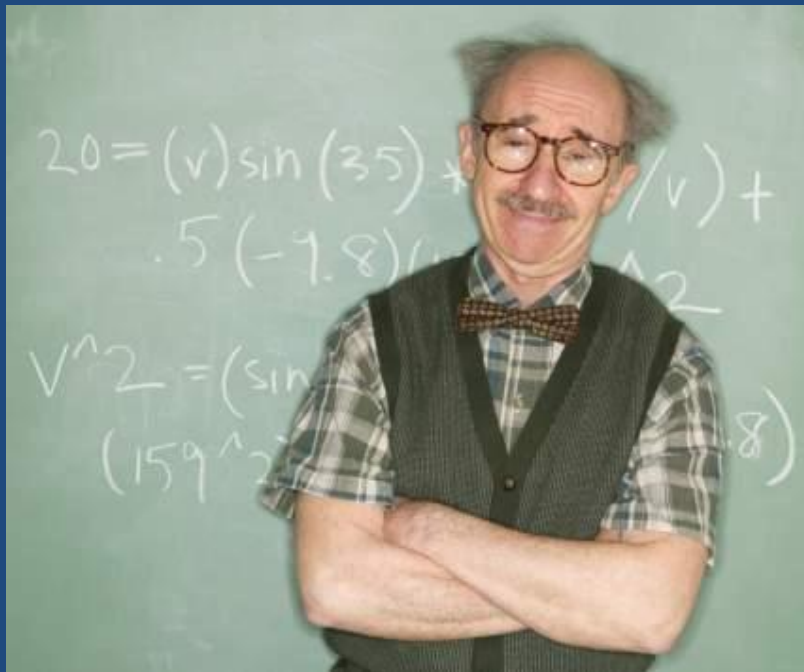
Retina patients

Palm-Pilot VFQ vs standard NEI-VFQ

Substantial time savings



# Analytic techniques for PROs



# Analytic techniques

Item response theory  
(IRT)



Classical test theory  
(CTT)





# Conventional questionnaire development (CTT)

Identify domains and items

Choose response options

*(0=never; 1=rarely;  
2=sometimes; 3=often; 4=all  
the time)*

Attempt to cover a broad  
range of issues



# Conventional questionnaire development (CTT)

- Pilot-test the questionnaire
- Find groups of related items  
*(subscales)*
- Compute score for each subscale
- Compare scores between groups



# Conventional questionnaire scoring





# Item Response Theory

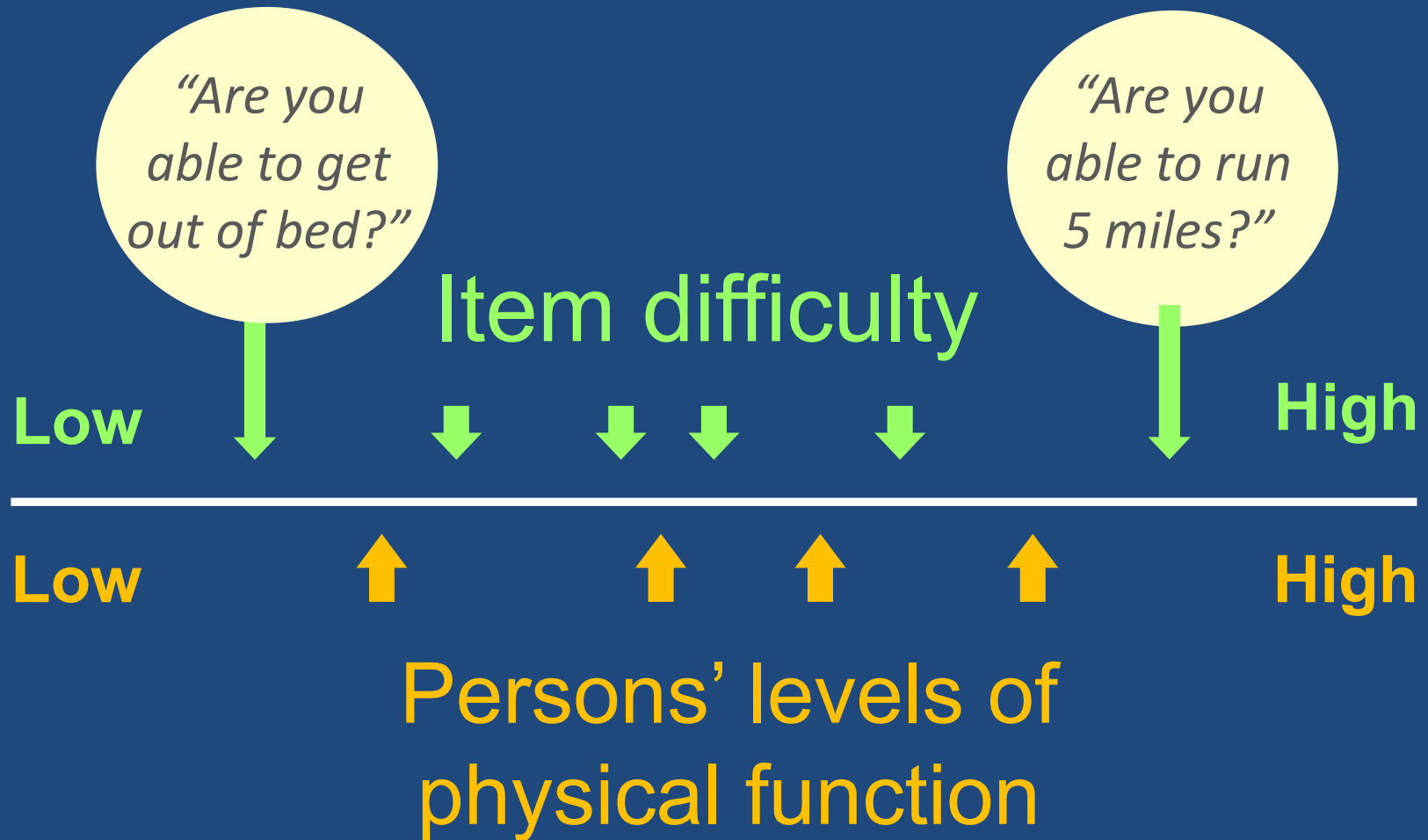
Unidimensional trait of interest

Items encompass the entire range of that single trait

Item difficulty is mathematically related to person ability



# IRT: People and items are represented on the same scale



# Advantage of IRT

Items are on a metric scale

Items interchangeable, as long as they have the same difficulty level

More efficient testing



# Computerized Adaptive Testing (CAT)

Select the most informative follow-up question to an initial question

Questions are adapted to the patient based on responses to the previous question



# PROMIS<sup>®</sup>

Patient Reported Outcomes  
Measurement Information  
System

Uses answers that patients  
provide to questions

Produces numeric values to  
indicate patients' state of  
wellbeing or suffering, as well  
as their ability or lack of  
ability to function



# Fatigue Item Bank

Lower Back  
Pain

Depression

Cancer

Heart Failure

COPD

*Same metric, same meaning*

# PROMIS<sup>®</sup>

Reliable, precise measures of patient-reported health status for physical, mental, and social well-being

PROMIS<sup>®</sup> tools can be used across a wide variety of chronic diseases and conditions and in the general population



# PROMIS<sup>®</sup>

Comparability: measures are standardized so there are common domains and metrics across diseases/conditions

Flexibility: can be administered in a variety of ways, in different forms

Inclusiveness: items designed for all people, regardless of literacy, language, physical function, or life course

<http://www.nihpromis.org/about/overview>





