# Item Response Theory Session 12, Lecture 10 11/29/06

### Outline

- Item Response Theory vs. Classical Test Theory
- Basic assumptions and concepts
- Three main types of models
- Examples from the literature



















![](_page_5_Figure_1.jpeg)

![](_page_6_Figure_0.jpeg)

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![](_page_7_Figure_0.jpeg)

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## **Computer Adaptive Testing**

•Starts with an average item (b=0)

- •Based on previous items, "zeros in" on an estimate of test-taker's theta that is as precise as possible (by giving items with high information at the current estimate of theta.
- •When the desired precision is reached, the test stops.

•Result: as brief a test as possible BUT

- •Scores among test-takers are measured on the same scale
- •All test-takers scores are measured with the same precision

#### Assessment of Self-Reported Physical Activity in Patients With Chronic Pain: Development of an Abbreviated Roland-Morris Disability Scale

Michael W. Stroud,\* Patrick E. McKnight,<sup>+</sup> and Mark P. Jensen\*

The Journal of Pain, Vol 5, No 5 (June), 2004: pp 257-263

Can a long scale on pain-related disability be reduced without loss of information?

## Sample Characteristics

988 patients with chronic pain (425 men, 573 women) who were screened for possible treatment at the University of Washington Multidisciplinary Pain Program.

Average age of study patients was 43.5 years, mostly white 84.4%, 59.5% reported that they were unemployed as a result of pain. 56.7% were receiving financial compensation for their pain.

Roland-Morris Disability Scale (18-item version)	<ol> <li>I stay at home most of the time because of my back.</li> <li>I walk more slowly than usual because of my back.</li> <li>Because of my back, I am not doing any of the jobs that I usually do around the house.</li> <li>Because of my back, I use a handrail to get upstairs.</li> <li>Because of my back, I lie down to rest more often.</li> <li>Because of my back, I have to hold on to something to get out of an easy chair.</li> <li>Because of my back, I try to get other people to do things for me.</li> <li>I get dressed more slowly than usual because of my back.</li> <li>I only stand up for short periods of time because of my back.</li> <li>I find it difficult to get out of a chair because of my back.</li> <li>I find it difficult to turn over in bed because of my back.</li> <li>I have trouble putting on my socks (or stockings) because of the pain in my back.</li> <li>I sleep less well because of my back.</li> <li>I avoid heavy jobs around the house because of my back.</li> <li>Because of my back, I am nore irritable and bed tempered with people than usual.</li> <li>Because of my back, I go upstairs more slowly than usual.</li> </ol>
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## Criteria for Keeping Items

- Want high discrimination (a)
- BUT, even highly discriminant items will have low information for thetas that are far from that item's b.
- So, you want a good range of b's, as well.

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![](_page_11_Figure_0.jpeg)

![](_page_11_Figure_1.jpeg)

![](_page_12_Figure_0.jpeg)

![](_page_12_Figure_1.jpeg)