The Scientific Method

• Goal:

• Guidelines:
  – Systematic approach:
  – Control of Conditions:
  – Empirical:
  – Critical:

4 Steps in Experimentation Process
Developing Hypotheses

• Concrete and logical ideas
• Inductive and deductive relationships
• Operationally define IVs and DVs

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Developing Hypotheses

1. Define IV and DV
   • IV =
   • DV =

2. Operationally define how the IV and DV are to be measured

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Developing Hypotheses

3. Statement of hypothesized relationship between IV and DV

4. Statement of how the IV and DV will be examined or tested
   • “Based on the findings of Smith (2002) it is hypothesized that males will score lower on the anxiety scale than females”

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Issues in Measuring PA

1.

2.

3.

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Validity

- Ability of test to measure what it is supposed to
  - Ecological validity =

- Concurrent validity =

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Reliability

- Ability of a test to yield consistent and stable scores
  - Test-retest =

  - Interrater =

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Questionnaires for Adults

- LTEQ (Godin et al., 1985)
  - assesses amount of mild, moderate, strenuous exercise done for at least 15 min in leisure
  - transforms to METS by multiplying mild (3), moderate (5), and strenuous (9)
  - positive: easy to administer
  - negative: low T-R reliability for mild and moderate

7-Day PAR

- Blair et al. (1985), Sallis et al. (1993)
- Report # hours spent in sleep, moderate, hard, and very hard activities during past week
  - transformed to METS by multiplying mild (4), moderate (6), and strenuous (10)
  - positive: assesses both occupational and leisure activity
  - negative: reliability of past exercise?

IPAQ

- International Physical Activity Questionnaire
- Assesses amount of mild, moderate, and strenuous physical activity done in previous week
  - housework, gardening, etc
- Brand new – so limited knowledge of validity
  - has a website
Other Measures

- Ratings of Perceived Exertion (Borg, 1998)
  - Used to assess exercise intensity
  - 6 = “very very light” to 20 = “very very hard”
  - positive = valid and reliable assessment
- Cognitive Interviews
  - response latency (time lapse in Q & A)
  - confidence ratings (degree of confidence)

Measuring Children’s PA

- How old do children have to be to accurately assess their self-report of activity?

Objective Assessments

- Pedometers
  - track step counts
  - positive –
  - negative –
Objective Assessments

• Accelerometers
  – vertical/horizontal/lateral movement
  – positive –
  – negative –

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Objective Assessments

• Heart Rate Monitors
  – assess intensity
  – positive –
  – negative –

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Criterion Assessments

• Behavioral Observation
  – watch person, record their physical activity
  – positive –
  – negative –

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