A checklist for evaluating the validity and suitability of existing physical activity and sedentary behavior instruments

Maria Hagströmer, Karolinska Institutet, Sweden

Heather Bowles, NCI/NIH

Presented at

Measurement of Active and Sedentary Behaviors: Closing the Gaps in Self-Report Methods

National Institutes of Health, Bethesda, MD • July 21, 2010

Which instrument is the best for my study?

- How to assess the quality of a validation study
- What to consider if I want to set up a validation study
- What to consider in reviewing validity studies

Overview

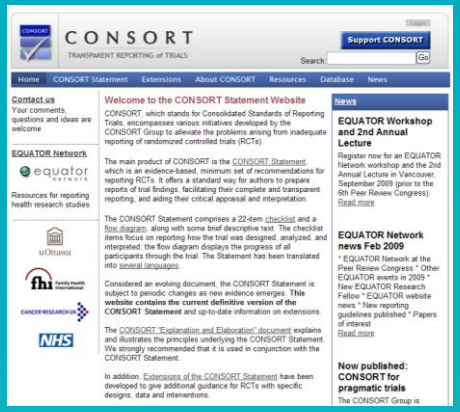
- Background and purpose
- Development of a methodological quality checklist
- Evaluation template
- Next step, inter-rater reliability

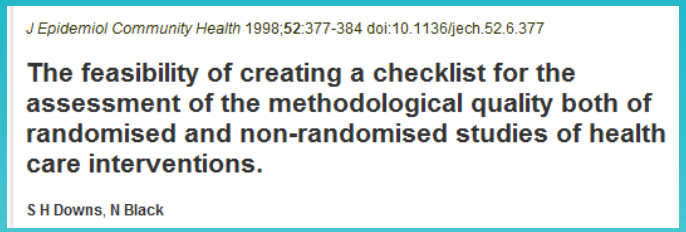
Background

- Multiple physical activity self-report instruments are found in the literature
- Lack of guidance for the uninitiated about how to choose a self-report instrument from the many available
- Lack of guidance for assessment of validation study quality

Existing guidance

- CONSORT Statement – recommendations on how to report RCT´s
- STROBE Statement – how to report observational studies
- Downs & Black – checklist for assessment of quality of randomised and non-randomised studies





Purpose

- To develop a checklist to assess key criteria for physical activity/sedentary behavior validation studies

- The checklist can help guiding instrument selection from a registry as well as design and reporting of physical activity/sedentary behavior instrument validation studies

Framwork components

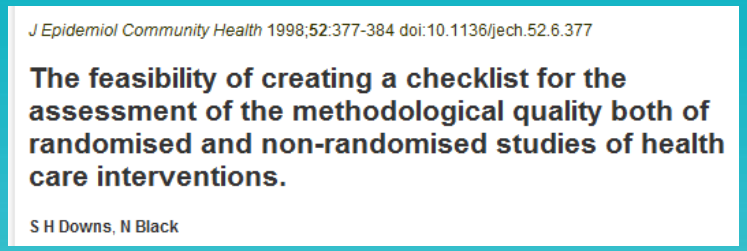
- Medline search for pulished guidelines
- Rennie & Wareham 1998

Public Health Nutrition: 1(4), 265–271

The validation of physical activity instruments for measuring energy expenditure: problems and pitfalls

Kirsten L Rennie and Nicholas J Wareham*
Department of Community Medicine, Institute of Public Health, University of Cambridge, Cambridge CB2 2SR, UK

- Key criteria: Physical activity construct clearly defined
- Downs & Black 1998



J Epidemiol Community Health 1998;**52**:377-384 doi:10.1136/jech.52.6.377

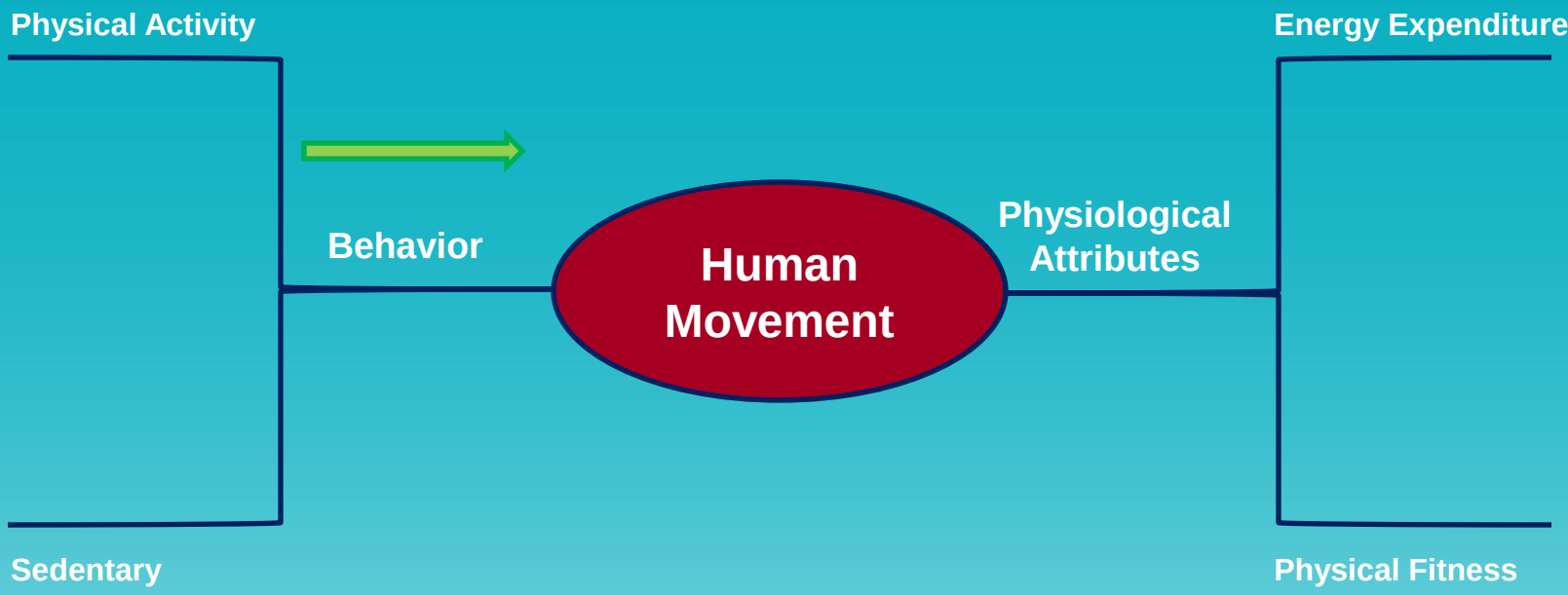
The feasibility of creating a checklist for the assessment of the methodological quality both of randomised and non-randomised studies of health care interventions.

S H Downs, N Black

- Additional methodological criterias to questionnaire design

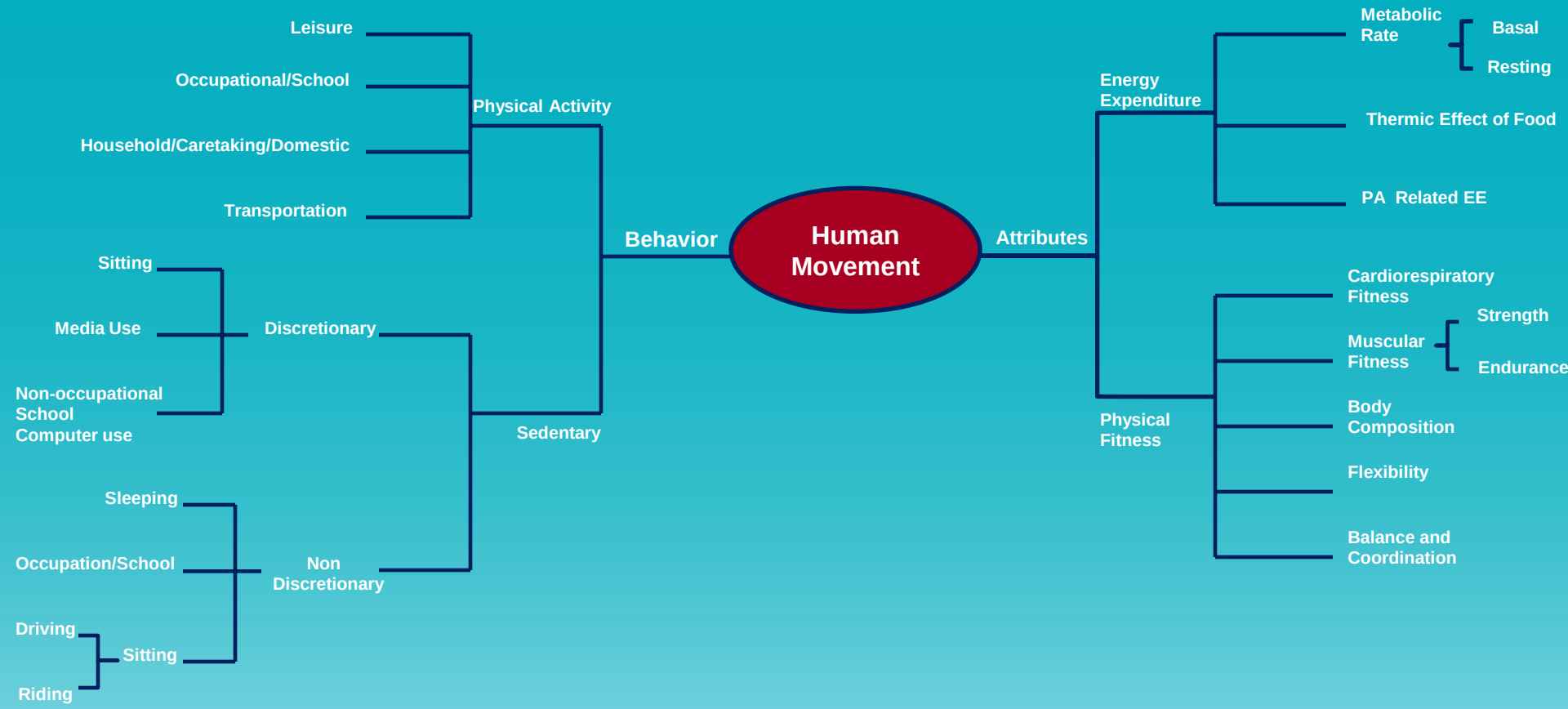
Key criteria

Conceptual framwork Human Movement



Pettee Gabriel & Morrow, 2010

Human Movement Framework



Pettee Gabriel & Morrow, 2010

Evaluation template

- Subscale A: Reporting, 9 possible points
- Subscale B: External validity, 3 possible points
- Subscale C: Internal validity – bias, 9 possible points

X Yes = 1

No = 0

Subscale A: Reporting

1. Is the hypothesis/aim/objective clearly described?
2. Are the operational definitions of main physical activity contructs to be validated clearly described in the Introduction or Method section?
3. Are the characteristics of the participants included in the study clearly described?
4. Are the distributions of principal confounders clearly described?

Reporting cont.

5. For studies validating an existing measure has the original source been cited? For studies validating a modified version of an existing measure, has the original source been cited and the modifications been clearly described?

6. Are the methods of administration and/or data reduction for the self-report measure and the reference measure cleary described?

Reporting cont.

7. Have the characteristics of participants with missing, incomplete, and/or invalid data been described?

8. Does the study provide information about the variability in the data for the main physical activity constructs?

9. Have limits of agreement and/or confidence interval been reported for the main analysis?

Subscale B: External validity

1. Were the individuals asked to participate in the study representative of the entire population from which they were recruited?

2. Were those participants who were enrolled in the study representative of the entire population from which they were recruited?

3. Was the self-report measure administration (e.g researcher-participant contact, survey mode etc) representative of the procedures applied under epidemiologic or behavioral research constraints?

Subscale C: Internal validity

1. Was an attempt made to minimize altered physical activity behavior by the participant in response to awareness and burden of measurement?

2. Was an attempt made to blind research staff to the activity levels or characteristics of the participants to prevent leading responses to the self-report measure?

Internal validity cont.

3. Does the reference measure assess the physical activity construct(s) of interest with greater accuracy than the self-report measure, and are errors in the reference method uncorrelated with errors in the self-report measure?

4. Did the self-report measure and the reference measure assess physical activity in the same time frame?

Internal validity cont.

5. Was complicance with the measurement protocol acceptable?

6. Was reproducibility of the main physical actiity constructs reported for the self-report measure?

7. Were statistical tests used appropriate to assess validity for the main physical activity constructs between the self-report measure and the reference measure?

Internal validity cont.

8. If any of the results of the study were based on ”data dredging” was this made clear?

9. Did the study have sufficient sample size to assess agreement?

Summary

- Lack of guidance on how to assess the quality of validation studies
- A checklist with 21 items is developed based upon the literature
- The checklist will be tested for inter-rater reliability

Thank you for your attention!

Welcome to Sweden!