Slide

1.

2.

3. “fatal flaw of obesity research”

lack of physical activity is linked to obesity, first physical activity guidelines stipulated by federal government, but we should know whether people adhere to these guidelines or not. This could have implications for policy

4.

5. first law of thermodynamics, change in energy stores refers to changes in body composition

energy balance provides an alternative way to measure EI, which is typically very difficult and clouded with measurement error and within person variability, gold standard and cheap, objective measures exist for both EE and ES. Gold standard is DXA and DLW

6. There is clearly relationships between EE, ES, EI, so modeling energy balance instead of just one component can make model more useful and powerful. People in the obesity research field already use energy balance in their mathematical models, but “even with DLW and DXA measurements, the relationship doesn’t hold and its suspected this is due to measurement error and biological variation” -Diana Thomas

7. followed individuals for a year, and get 5 measurements of a lot of stuff every 3 months. Only the gold standard measure of ES, no replciation on gold standard DLW. Don’t technically have replicates, but will use this data to help build a measurement error model for energy balance

8. Diagnostic for checking distribution of measurement errors given by Carroll.

9. We suspect that cheaper devices measuring EE and ES have biases involved in their measurements and formulas. For the subset of individuals who received DLW, we ran the multiple regression, even though the armband and DLW are measuring the same thing, other covariates still seem to be important. Could mean device is biased by certain demographic factors. We are also making an assumption that the relationship is linear

10. For our purposes, we will have units in avg kcal/day, because DLW gives estimate over course of 2 weeks, we want to keep units consistent. We don’t need to specify exactly which cheap measurement we’re using (so long as its not self-report) as any instrument can be modeled in the general framework we’re presenting. Usual can be thought of as 2-3 year average

11. give justification for assuming conditional independence

12. same model as what we fit with EBS data, don’t expect estimates for gamma to be biased, but slope on W is not true relationship between y and x. sigma2 includes measurement error and within person variability

13. measurement error model. Make distributional assumption about latent variables (joint)

14.