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Childhood Obesity Prevention: What should we be doing?

Tom Baranowski, PhD

Professor of Pediatrics (Behavioral Nutrition & PA)

USDA/ARS Children's Nutrition Research Center

Baylor College of Medicine

Houston, Texas, 77030, USA

www.bcm.edu/cnrc/faculty/?PMID=9519



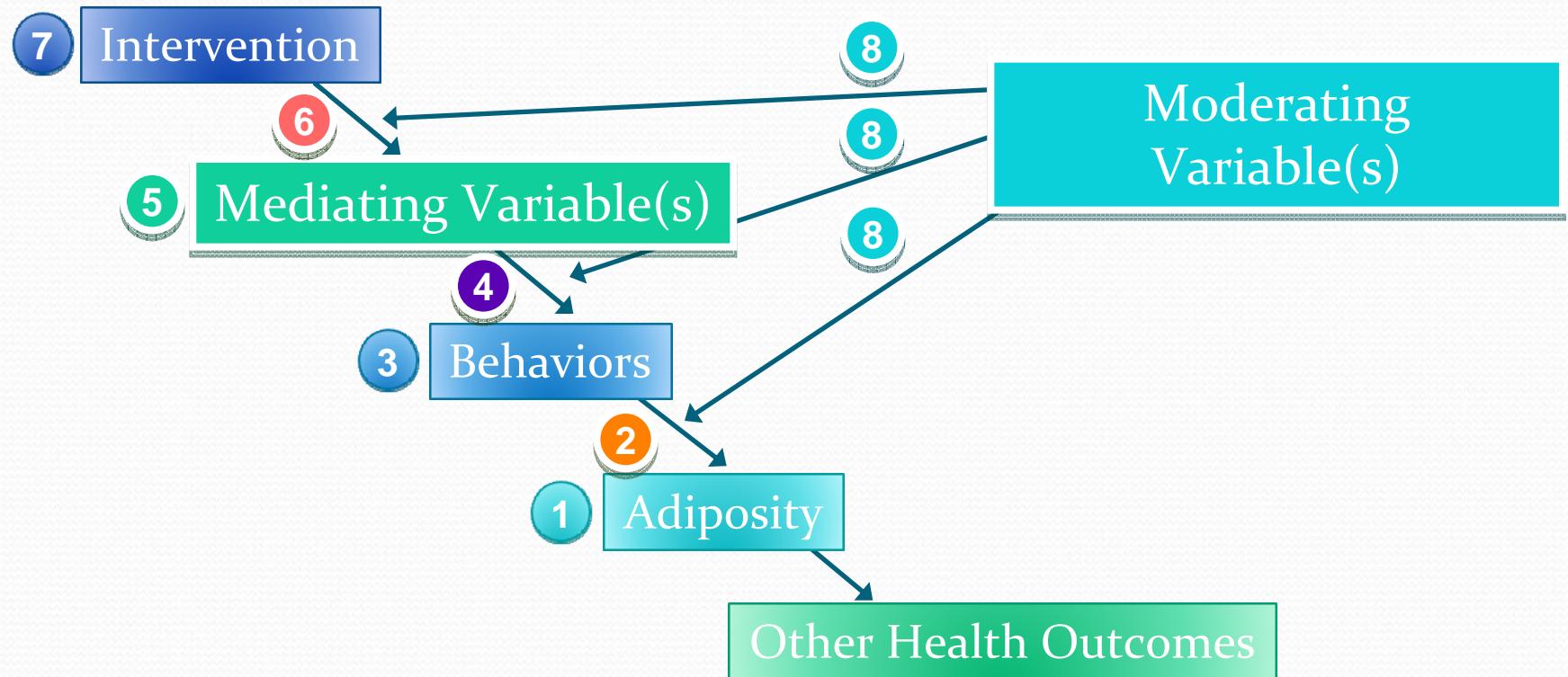
Obesity Prevention Interventions (population based)

- Most are not working
- When work, very small changes
- Not clear what intervention components lead to change
 - Obesity prevention – children
 - (C Summerbell, et al, Cochrane Database Syst Rev, 2005 (3):CD001871)
 - Obesity prevention – adults
 - (VE Lemmens, et al, Obes Rev, Feb 19 2008)
 - Family based obesity prevention/PA promo
 - (TM O'Connor, et al, Am J Prev Med, submitted)

Obesity Prevention Interventions (population based)

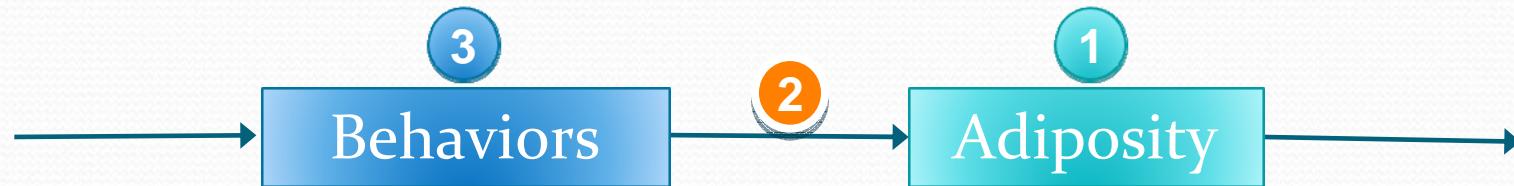
- Why are we in this situation?
- What should we be doing?

Mediating-Moderating Variable Model (MMVM) Offers a Framework To Understand Why We Are Here



Assumptions of the MMVM

- Is pan-theoretical
- Interventions must be adequately implemented according to theory based protocol
- Interventions impact mediating variable(s)
 - Influences on behavior (personal, social, ecological, biological)
- Changes in mediating variables change behaviors
- Changes in behavior change adiposity
- Changes in adiposity change physiological outcomes
- Relationships are strong and causal
- Moderators: Variables accounting for differences



- 2a. What behaviors are most strongly and causally related to adiposity?
 - Targeted behaviors not related to adiposity, e.g. sweetened beverages
 - (C Bachman, et al, Nutr Rev, 2006;64:153-174)
 - Relationships of behaviors to adiposity change with age?
 - (R Jago, et al, Int J Obes, 2005;29(6):557-564)
 - Hard to find patterns over time
 - (T Nicklas, et al, Am J Prev Med, 2003;25(1):9-16)
 - (T Nicklas, et al, J Am Coll Nutr, 2001;20:599-608)
 - (T Nicklas, et al, J Am Diet Assoc, 2004;104:753-761)
 - (T Nicklas, et al, J Am Diet Assoc, 2004;104:1127-1140)



- Walter Willett questions:
 - Do FV protect against adiposity?
 - Should we encourage FV intake?
 - FJ promotes obesity?
 - Baked potatoes promote obesity?
- Russ Pate says we've never really studied “inactivity”
 - (ESSR 2008, 36:173-178)



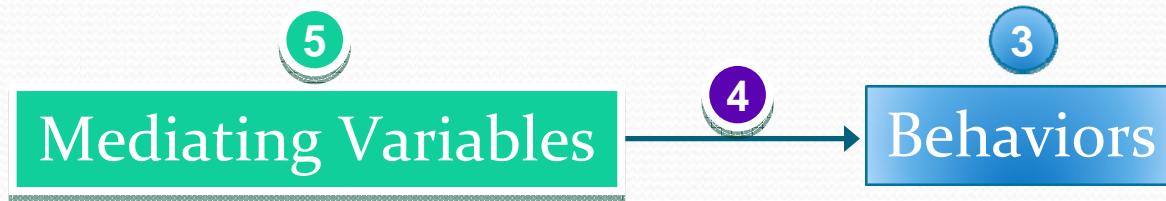
- 2b. How complex are these relationships?
 - Perhaps intakes of foods or food groups are parts of larger patterns, i.e. dietary intake patterns, e.g. Mediterranean diet
 - (J Woo, et al, Euro J Clin Nutr, 2008;62:480-487)
 - Do these complex eating patterns better predispose to change?



- 2c. What is the level of caloric intake excess that is predisposing to obesity? Is this level the same in all sub-groups?
 - 100 calories/day?
 - (J Hill, Science, 2003;299:853-855)
 - 110-1017 calories/day?
 - (YC Wang, et al, Pediatrics, 2006;118:e1721-e1733)
 - 329-2013 calories/day?
 - (C Bouchard, Int J Obes, 2008;32:879-880)
 - 350 calories/day of NEAT?
 - (JA Levine, et al, Science, 2005, 307:584-586)



- 3a. Are we using measures of these behaviors with acceptable metrics (validity, reliability, sensitivity to meaningful change)?
 - Metrics often not reported in articles
 - (T Baranowski, et al, Am J Prev Med, 1998;15(4):266-297)
 - Validity of 0.9 necessary to minimize misclassification error
 - (C de Moore, et al, Pub Health Nutr, 2003;6:393-399)
 - We don't usually get close
 - PA → adiposity?
 - (O Bar-Or, T Baranowski, Ped Exercise Sci, 1994;(6):348-360)
 - Severe under-reporting by the obese
 - How to correct? Huang method?



- 4a. What mediating variable or combinations of mediating variables are necessary to change behavior?
 - What are the best mediating variables?
 - Hypothesized mediating variables not related + suppressors
 - (L Haerens, et al, Int J Behav Nutr Phys Act, 2007;4:55)
 - How do mediating variables change (process)?
 - Tailoring: (R Hawkins, et al, Health Ed Res, 2008;23:454-466)
 - What strength of relationship is minimally necessary
 - E. Cerin graphs

Figure b.10. Bio-behavioral Model of Likely Influences on Diet, Physical Activity and Adiposity

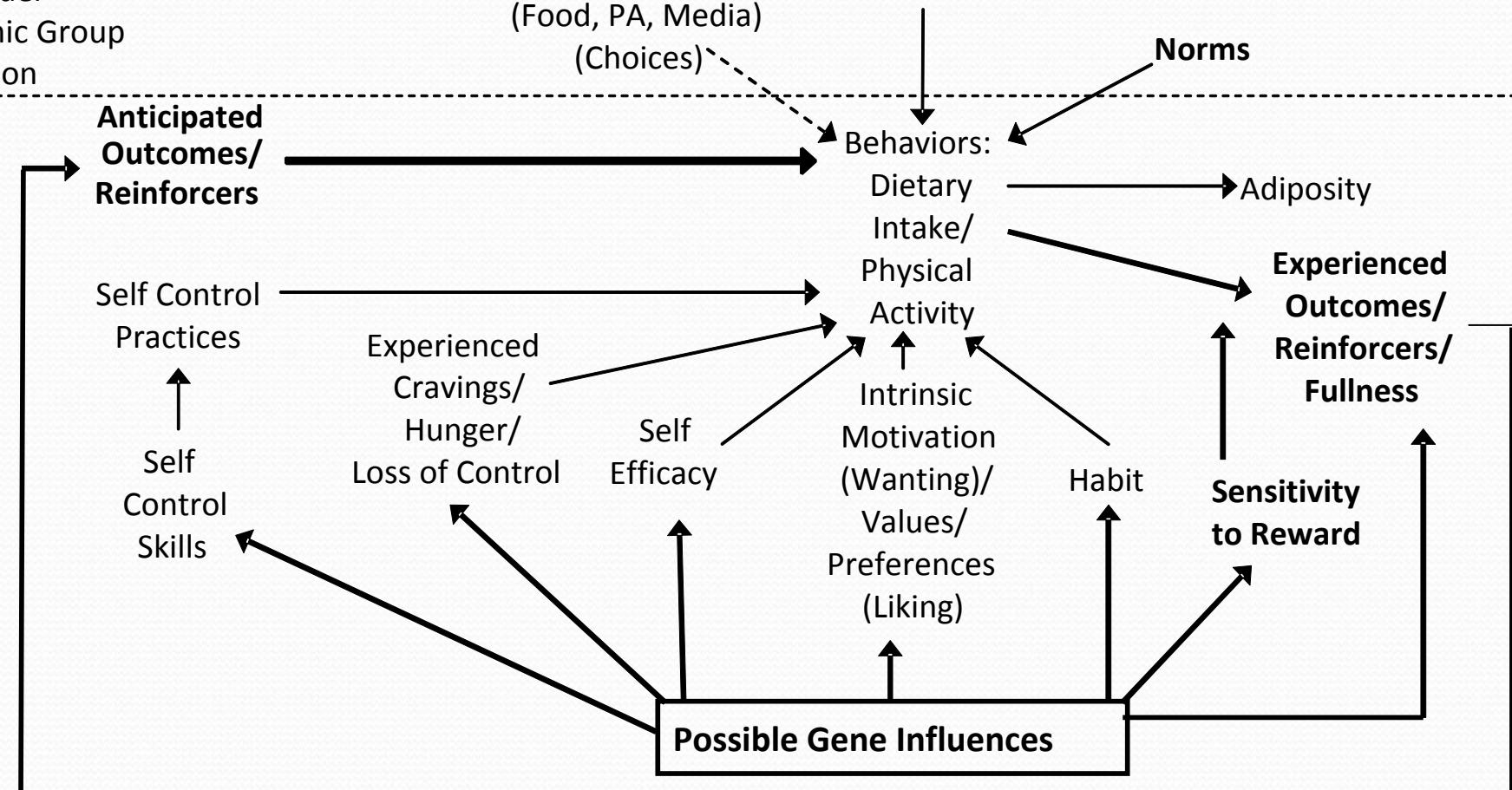
Contextual Factors:

Socioeconomic Status (income, education)
 Gender
 Ethnic Group
 Region

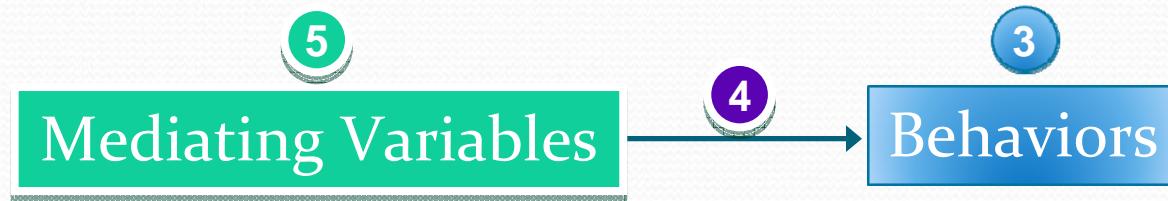
Home
 Environment
 (Food, PA, Media)
 (Choices)

Parenting
 (Food, PA, Media)

Environmental
 Influences



Bolded lines and words are hypothesized gene related influences; environmental influences; Non bolded items below dotted line are psychosocial influences.



- 5a. Are we using measures of these mediating variables with acceptable metrics (validity, reliability, range, sensitivity to meaningful change?)
 - Self efficacy
 - (K Watson, et al, Health Educ Res, 2006;21 Suppl:i47-57)
 - “Validated measure”
 - (C deMoor, T Baranowski, Pub Health Nutr, 2003;6:393-399)

What Should We Be Doing? (1)

- Obesity prevention intentions need to target the interventions at the most influential causal behavior and psychosocial variables among the children at the highest risk for obesity

What Should We Be Doing? ⁽²⁾

To get that information we need:

- A longitudinal study
 - Wrap around design
- Using the best measures of adiposity, behaviors and psychosocial variables
- Among ethnic minority children
 - (where obesity is most common)
- With a large enough sample to enable complex analyses

Wrap Around Design:

Grades	Year 1	Year 2	Year 3	Year 4
3 rd	3 rd			
4 th		4 th		
5 th			5 th	
6 th	6 th			6 th
7 th		7 th		
8 th			8 th	
9 th	9 th			9 th
10 th		10 th		
11 th			11 th	
12 th				12 th
In 4 years – cover 10 years of development with overlap				

**We Have A Lot Of Work To Do
Before We Solve the Obesity
Reduction Problem!**

Thank You!
ARIGATŌ!
DANKE!
EFHARISTÓ!
MERCI BEAUCOUP!
MGÒI!
MUCHAS GRACIAS!
MUITO OBRIGADO!
SERDECZNIE DZIĘKUJĘ!
SHUKRAN!
TACK SÅMYCKET!
TAKK!
XIE XIE!