

Shop with your eyes open:

choosing tools to evaluate your nutrition education program

moderator

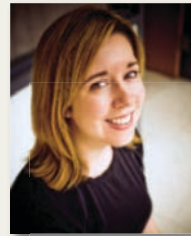


**Deirdra
Chester**
PhD, RD

speakers



**Marilyn
Townsend**
PhD, RD



**Mical
Shilts**
PhD



**Karina
Diaz Rios**
PhD, RD



**Lenna
Ontai**
PhD

SNEB 2020



By the end of the session you will be able to...

Identify different types of validity & reliability and the relevance of each

Understand the significance of the phrase 'beyond self-report' for validation

Better analyze published papers to determine target audience fit and accuracy of the evaluation tool

learning objectives



purpose of validation

To prove your tool has meaning

To prove it means what you say it does

To assess its accuracy

tool purpose



1

evaluation

pre-post evaluation of
community programs

2

risk prediction

identification of those most
in need of intervention

3

program planning

address risk behaviors of
target group

4

tailoring

selection of behavioral
goals for an intervention

5

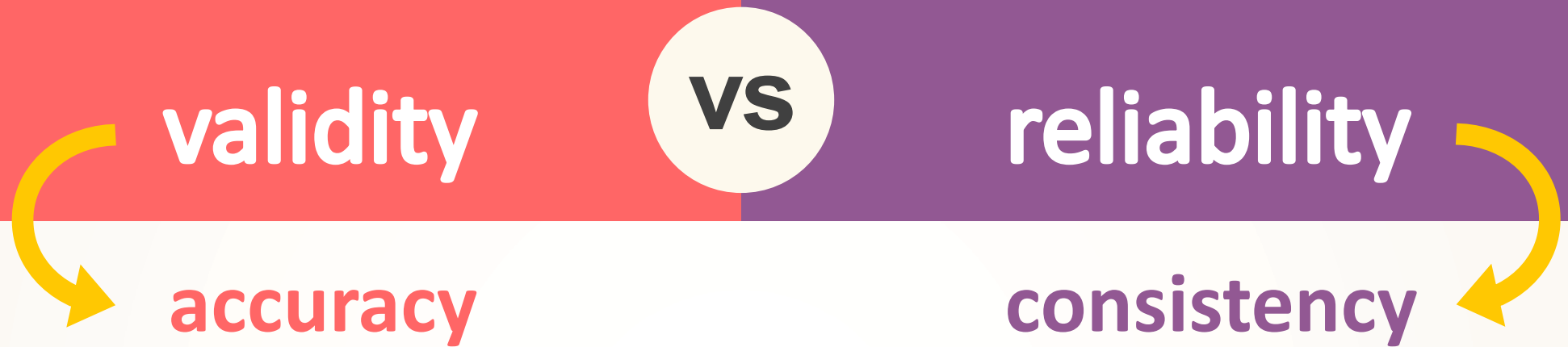
surveillance

assessment of population
outcomes over time

6

survey

assessment of community
needs and behaviors



A tool can be reliable while *not* being valid

So, important to study both

validity

vs

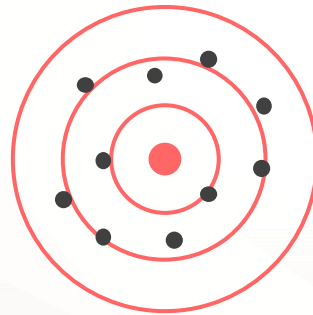
reliability

accuracy

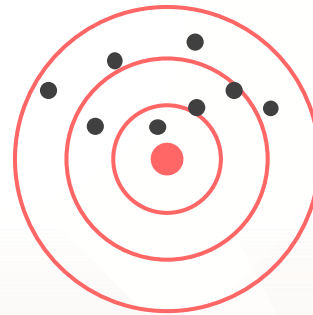
consistency



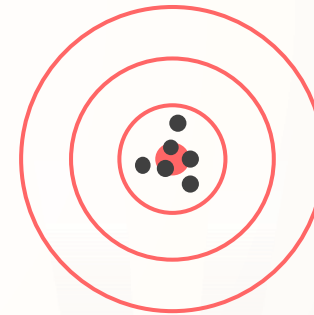
reliable
not valid



low validity
low reliability



not reliable
not valid



reliable
and valid

validity



accuracy

validity

accuracy




content

content
relevance

literature search
expert panel

[illegible]

 not if measures
what is intended

face

suitable for
audience


cognitive interviews
cultural adaptation

19




Tengo frutas listas para que mi niño(a)
se las coma.

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
sari	algúnos	varios	sari	húdra
maruca	días	días	todos	los días

 not if content is appropriate

convergent

subjective
measure

- 24-hr diet recall
- food frequency
- behavior checklist
- food checklist

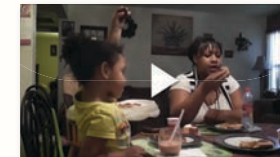
HK Category	HK Subscale	Items, n	Convergent Variables	r, P
dietary	Fruit/vegetable	7	Vegetables, cups equivalents	.36***
	HK dietary scale	14	Food Behavior Checklist	.47*****
other	Television	1	Average total television, min	-.53***
	Other screen time	1	Average total video/computer, min	-.50***


 not if related to BMI

critério


objective
measure

blood values
BMI, waist:height
video observations



 not if readability is appropriate

validity

 not if measures
what is intended

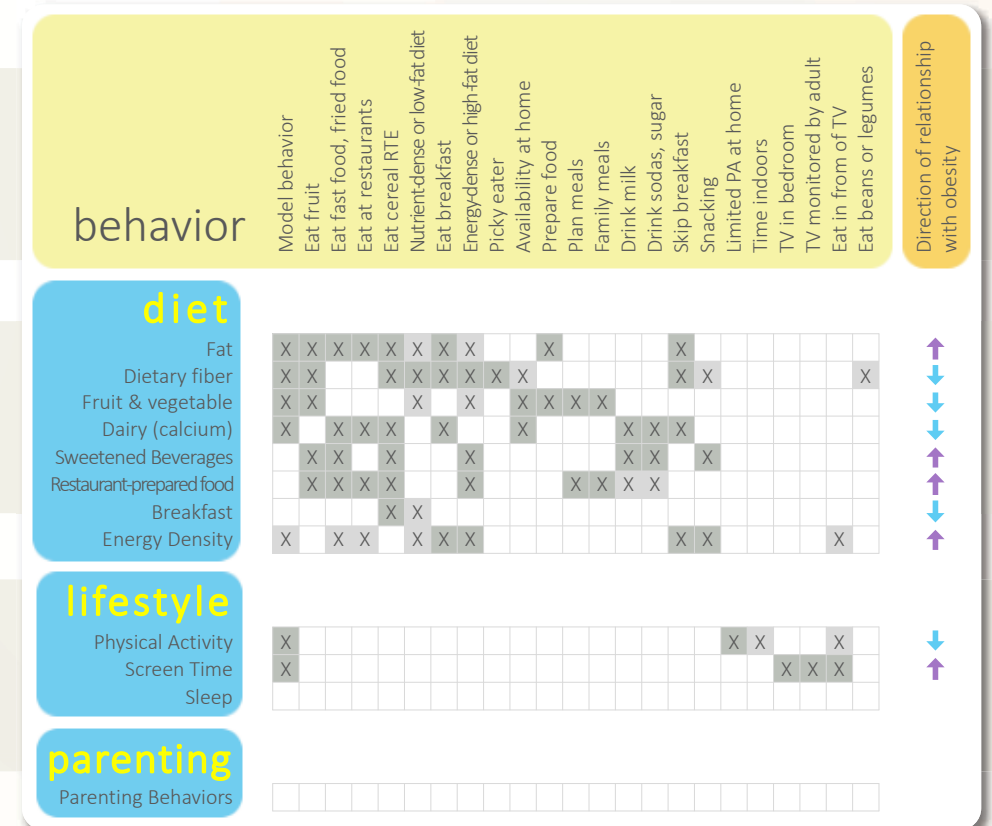
expert panel

1 domain identification

literature review

2 domain relevance for target respondent

3 existing tool identification
literature review



validity

accuracy



content

content
relevance

literature search
expert panel

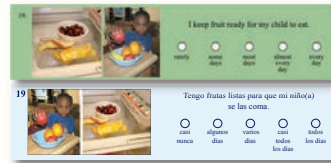


not if measures
what is intended

face

suitable for
audience

cognitive interviews
cultural adaptation



not if content
is appropriate


face

validity



suitable for
respondent

assessment of suitability to target respondent | systematic

 not if content
is appropriate

cognitive
interviews

clarity

Can you please read the question aloud?

comprehension

How would you respond to
this question?

appropriateness

Are there any words you
would change?

relevance

What does this scenario look like in
your household?

visuals

Does the photo represent the question
asked?

face


validity



suitable for
respondent

cognitive
interviews

example

 not if content
is appropriate

When shopping, do you use the Nutrition Facts
on the food label to choose food?



never



sometimes



often



always

When shopping, do you use the Nutrition Facts on the food label to choose food?

☐ never

☐ sometimes

☐ often

☐ always



When shopping, do you use the “Nutrition Facts” on the food label to choose food?

☐ never

☐ Yes,
sometimes

☐ Yes,
often

☐ Yes,
always



Nutrition Facts	
Serving Size 2 crackers (14 g)	
Servings Per Container About 21	
Amount Per Serving	
Calories 60	Calories from Fat 15
% Daily Value*	
Total Fat 1.5g	2%
Saturated Fat 0g	0%
Polyunsaturated Fat 0g	
Monounsaturated Fat 0.5g	
Cholesterol 0mg	0%
Sodium 70mg	3%
Total Carbohydrate 10g	3%
Dietary Fiber Less than 1g	3%
Sugars 0g	
Protein 2g	



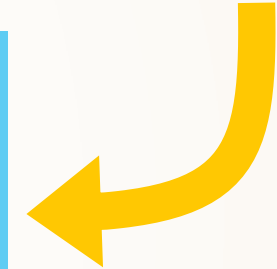
When shopping, do you use the “Nutrition Facts” on the food label to choose food?

☐ never

☐ Yes,
sometimes

☐ Yes,
often

☐ Yes,
always



Nutrition Facts	
Serving Size 5 Crackers (15g)	
Servings Per Container About 30	
Amount Per Serving	
Calories 60	Calories from Fat 15
% Daily Value*	
Total Fat 1.5g	2%
Saturated Fat .5g	2%
Trans Fat .5g	
Polyunsaturated Fat 0g	
Monounsaturated Fat .5g	
Cholesterol 0mg	0%
Sodium 170mg	7%
Potassium 15mg	0%
Total Carbohydrate 11g	4%
Dietary Fiber 0g	0%
Sugars 0g	
Protein 1g	



Do you use this label when food shopping?

☐ never

☐ Yes,
sometimes

☐ Yes,
often

☐ Yes,
always


face

validity

suitable for
respondent

cultural
adaptation

assessment of suitability to target respondent | systematic

 not if content
is appropriate



domains

clarity

comprehension

appropriateness

relevance

visuals

equivalence

face


validity



suitable for
respondent

cultural
adaptation

example

 not if content
is appropriate

I buy fruit

Yo Compro frutas

☐ casi nunca ☐ a veces ☐ con frecuencia ☐ con mucha frecuencia ☐ siempre

I eat fruit times a day

Yo Como frutas veces al día

domain

clarity

comprehension

appropriateness

relevance


visuals

equivalence

face

validity



 not if content
is appropriate

suitable for
respondent

example

cultural
adaptation

*Yes, he
eats fruit*

I eat fruit times a day

Como frutas veces al día



Yo como frutas veces al día

domain

clarity

comprehension

appropriateness

relevance

visuals

equivalence


face

validity

suitable for
respondent

cultural
adaptation

example

 not if content
is appropriate

Do you eat *this* vegetable?

English



☐ Artichoke



☐ Asparagus



☐ Brussel
sprouts



☐ Eggplant



☐ Mushrooms

Do you eat *other* vegetables?

Spanish



☐ Chayote



☐ Chiles
Secos



☐ Nopales



☐ Tomatillos



☐ Jugo de
vegetales

domain

clarity

comprehension

appropriateness

relevance

visuals

equivalence

> [Nutrients](#). 2018 Nov 2;10(11):1617. doi: 10.3390/nu10111617.

Evaluation Tool Development for Food Literacy Programs

Andrea Begley ¹, Ellen Paynter ², Satvinder S Dhaliwal ³

content

content
relevance

Evidence search on Australian food literacy
construct and components

Item identification for intervention domains
from existing relevant tools

Content and format feedback
from program facilitators
from food literacy experts (n=4)

face

suitable for
audience

Acceptability and Comprehension
literacy, numeracy, cognitive load
via observation and discussion

Wording and relevance
participant feedback

Readability
Flesh Kincaid reading formula

published example

validity

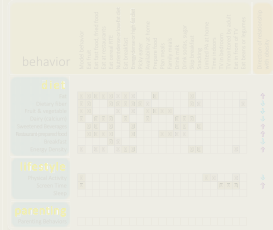
accuracy



content

content
relevance

team of experts
literature reviews

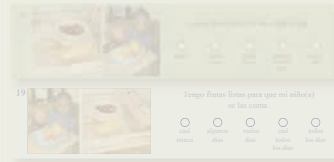


not if measures
what is intended

face

suitable for
audience

cognitive interviews
cultural adaptation



not if content
is appropriate

convergent

subjective
measure

24-hr diet recall
food frequency
behavior checklist
food checklist

HK Category	HK Subscale	Items, n	Convergent Variables	r, P
dietary	Fruit/Vegetable	7	Vegetables, cups equivalents	.36***
	HK dietary scale	14	Food Behavior Checklist	.67***
other	Television	1	Average total television, min	-.53***
	Other screen time	1	Average total video/computer, min	-.50***

not if related to BMI


convergent

validity



subjective
measure

compare accuracy to a similar measure of a construct | systematic

 not if related to BMI

24-hr diet
recall

food
frequency

behavior
checklist

food
checklist

For example:

Do fruit & vegetable item responses from an obesity risk assessment tool correspond to cups of fruit & vegetables reported on 24-hr recalls?

Do responses from a screen time items from an obesity risk assessment tool correspond to daily screen time minutes from a 24-hr screen time log?

convergent

validity



⊘ not if related to BMI

compare accuracy to a similar measure of a construct | systematic

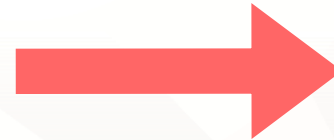
subjective
measure

24-hr diet
recalls

36-hour
activity &
screen time

food
behavior
checklist

The image shows two forms. The top form is titled "My Child's Activity & Food Diary" and features a night sky illustration with stars and a moon. It includes fields for "For office use", "Your next appointment time", and "Date". Below the title, it says "Fill out this diary for 24 hours. Start at 6:00 a.m. The topics are child's school time, sleep, screen time, and physical activity. In addition, record YOUR screen time and physical activity." The bottom form is titled "Food Behavior Checklist" and includes questions about fruit/vegetable intake, fruit drink/sport drink consumption, and citrus fruit/citrus juice intake. It has checkboxes for "yes" and "no" and a scale for frequency.



The image shows a form titled "Healthy Kids" with a header for "Name" and "Date". It contains four numbered sections with photos and questions. Section 1 shows a family eating and asks "I sit and eat a meal with my child." with frequency options. Section 2 shows a child eating fruit and asks "My child eats fruit." with frequency options. Section 3 shows a child in bed and asks "My child goes to bed around" with a time input. Section 4 shows a child eating cookies and asks "My child eats cookies" with frequency options. The form is branded with the University of California logo.

convergent

validity



subjective
measure

compare accuracy to a similar measure of a construct | systematic

 not if related to BMI



HK Category

dietary

other

HK Subscale

items, n

Convergent Variables

r, P

Fruit/vegetable

7

Vegetables, cups equivalents

.36***

HK dietary scale

14

Food Behavior Checklist

.47*****

Television

1

Average total television, min

-.53*****

Other screen time

1

Average total video/computer, min

-.50*****



common use

Easy to administer

Low cost

Low burden



interpretation caution

Social desirability

Inability to self-assess accurately

Memory



make robust

Combine with

objective measures, i.e., BMI,
video, blood biomarkers

beyond self-report

convergent

validity

Multi-modal validation approach

24-hr recalls + measured wt & ht

Convergent accuracy established
obesity risk assessment tool

> J Nutr Educ Behav. Jul-Aug 2018;50(7):705-717.

doi: 10.1016/j.jneb.2018.01.022. Epub 2018 Mar 19.

An Obesity Risk Assessment Tool for Young Children: Validity With BMI and Nutrient Values

Marilyn S Townsend¹, Mical K Shilts², Dennis M Styne³, Christiana Drake⁴, Louise Lanoue⁵, Lenna Ontai⁶

ABSTRACT

Objective: Demonstrate validity and reliability for an obesity risk assessment tool for young children targeting families' modifiable home environments.

Design: Longitudinal design with data collected over 100 weeks.

Setting: Head Start and the Special Supplemental Nutrition Program for Women, Infants, and Children.

Participants: Parent-child pairs ($n = 133$) provided food behavior assessments; 3 child-modified, 24-hour dietary recalls; $3 \geq 36$ -hour activity logs; and measured heights and weights.

Main Outcome Measure: Five measures of validity and 5 of reliability.

Results: Validity was excellent for the assessment tool, named Healthy Kids, demonstrating an inverse relationship with child body mass index percentile-for-age ($P = .02$). Scales were significantly related to hypothesized variables ($P \leq .05$): fruit or vegetable cup equivalents; folate; vitamins A, C, and D; β -carotene; calcium; fiber; sugar; screen, sleep, and physical activity minutes; and parent behaviors. Measures of reliability were acceptable.

Conclusions and Implications: Overall, children with higher Healthy Kids scores had a more healthful profile as well as lower body mass index percentiles-for-age 1.5 years later. Healthy Kids has potential for use by nutrition professionals as a screening tool to identify young children most at risk for excess weight gain, as an evaluation to assess intervention impact, and as a counseling tool to tailor intervention efforts. Future research should include validation in other settings and with other populations.

Key Words: evaluation, obesity, overweight, preschool, risk assessment (J Nutr Educ Behav. 2018;50:705-717.)

Accepted January 29, 2018. Published online March 19, 2018.

INTRODUCTION

Parents have direct influence over their children's physical, food, and social environments.¹ Yet, many families' nutrition and parenting practices and lifestyle behaviors create home environments that set young children on trajectories for unhealthful weight

gain. Among low-income preschoolers, 31% are overweight or obese in the US.² In response to the staggering obesity rates among children, Congress authorized federal programs to include an obesity prevention focus in their education programs for families with young children. These programs include *Head Start*;

the *Special Supplemental Nutrition Program for Women, Infants, and Children* (WIC);³ the *Supplemental Nutrition and Assistance Program-Education* (SNAP-Ed);⁴ and the *Expanded Food and Nutrition Education Program* (EFNEP).⁵ These 4 programs have a presence in all or most low-income communities in the US. Consequently, they have the potential to affect obesity prevalence among participants.⁷ Recognizing that this young age may be ideal for inter-

published example

validity

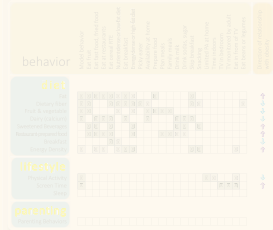
accuracy



content

content
relevance

team of experts
literature reviews

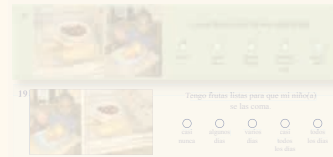


not if measures
what is intended

face

suitable for
audience

cognitive interviews
cultural adaptation



not if content
is appropriate

convergent

subjective
measure

24-hr diet recall
food frequency
behavior checklist
food checklist

HR Category	HR Subscale	Items, n	Convergent variables	C, P
dietary	fruit/vegetable	9	Vegetables, cups equivalents	.92***
	HR dietary scale	14	Food Behavior Checklist	.92***
other	television	1	Average total television, min	.92***
	Other screen time	1	Average total video/computer, min	.92***

not if related to BMI

criterion

objective
measure

blood values
BMI, waist:height
video observations



not if readability
is appropriate

crit


erion

validity



objective
measure

accuracy as related to a well-established standard of comparison (gold standard)

 not if readability
is appropriate


blood values

BMI,
waist:height

video
observation

For example:

Do parent responses on a childhood obesity risk
assessment tool correspond to the child's blood
biomarkers for obesity?

 not if readability
is appropriate


critrion

validity



external
objective
measure

accuracy as related to a well-established standard of comparison (gold standard)

 not if readability
is appropriate

blood
biomarkers
for obesity



Pro-Inflammatory	Anti-Inflammatory	Metabolic	Lipid	Carotenes
Leptin IL-6 IL-8 TNF α RBP-4 CRP	Adiponectin IL-10 IGFBP-1	Insulin Glucose HOMA QUICKI TG:GLU	Cholesterol Triglycerides HDL-C LDL-C (calc) CHOL:HDL-C TG:HDL-C	Retinol α -carotene β -carotene
14	4	7	8	3

criterion

validity

Comparison with objective measure
inflammatory biomarkers

Tool scores align with biomarkers
children with better HK scores
have lower inflammation index

AFRI_Healthy Kids Study Among 3–5 Years Olds: Validation with Biomarkers of Low-Grade Chronic Inflammation

► Marilyn S. Townsend, PhD,¹ Mical K. Shilts, PhD,² Louise Lanoue, PhD,¹ Christiana Drake, PhD,³ Dennis M. Styne, MD,⁴ Leslie Woodhouse, PhD,⁵ and Lenna Ontai, PhD⁶

Abstract

Background: Many families with young children practice nutrition, parenting, and lifestyle behaviors that set their children on trajectories for unhealthful weight gain. Potential adverse health effects of excessive body fat can result in the secretion of proinflammatory molecules and increased risk of inflammation and metabolic diseases. A pediatric obesity risk assessment tool named Healthy Kids (HK), demonstrated validity in a longitudinal study with child's measured BMI and 36-hour diet, screen, sleep, and activity logs. Our objective was to provide additional evidence of validity with low-income families with literacy issues using an inflammation index composed of four proinflammatory biomarkers.

Methods: Parent/child pairs ($n=104$) from Head Start and Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) provided HK, blood samples, and measured heights/weights. Select child inflammatory markers were discretized into two groups of HK scores. Data were analyzed with a mixed model adjusted for children's age and BMI.

Results: A significant HK–time interaction effect was shown for the child inflammation index with two data collection points 1 year apart ($p_{\text{int}}=0.039$). This index increased over 12 months in children with less healthful behaviors ($p=0.007$), but not in children with more healthful profiles ($p=0.58$).

Conclusions: Children with less healthful HK scores had an elevated inflammation index indicating a low-grade chronic systemic inflammatory state. Taken together with our previously published findings, the HK tool has potential as a rapid and easy-to-administer assessment of the family environment and the child's obesity risk. HK can be useful for federal nutrition programs for evaluation, risk assessment, goal setting, and/or program planning in clinical and community environments.

Keywords: biomarker; inflammation; obesity; risk assessment; validation; young children

Introduction

The 2016 prevalence of preschool children who are overweight is 26% and obese is 16%, despite concerted public health efforts.¹ Low-income families

complications, such as insulin resistance, metabolic syndrome, cardiovascular problems, and asthma.^{4–6}

The potential adverse health effects of excessive body fat are determined largely by type and distribution of fat.⁴ Excessive abdominal fat, also known as visceral fat, results in the secretion and activation of proinflammatory cells

published example

criterion

validity



external
measure

video
observation

accuracy as related to external, objective standard of comparison



not if readability
is appropriate



criterion

validity

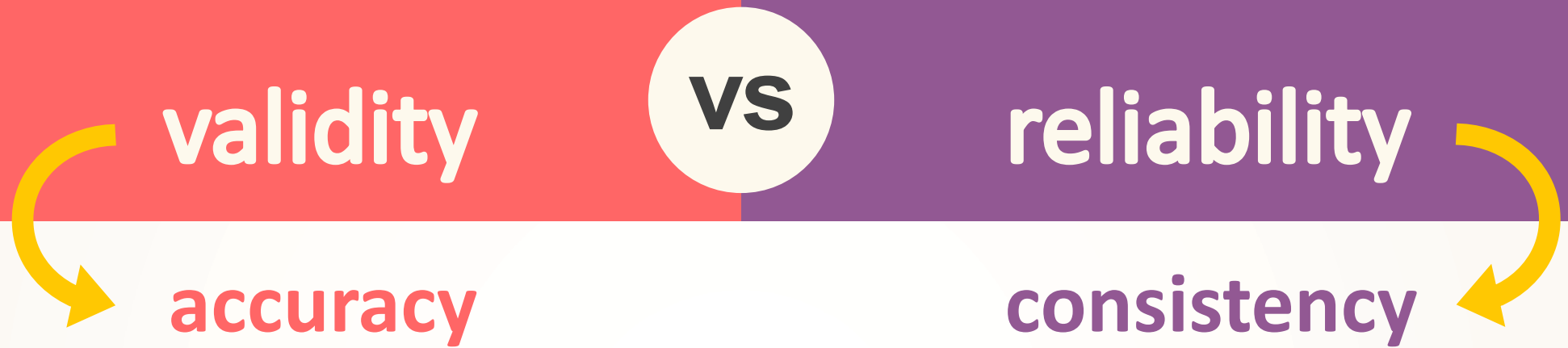
> [Appetite](#). 2019 May 1;136:62–69. doi: 10.1016/j.appet.2019.01.016. Epub 2019 Jan 21.

My Child at Mealtime Parent Self-Assessment of Food Related Behaviors: Validation With Mealtime Behaviors

Lenna L Ontai ¹, Carolyn Sutter ², Stephanie Sitnick ³, Mical K Shilts ⁴, Marilyn S Townsend ⁵

Parent Centered Items	Physical manipulation	Verbal directive/demand	Bargaining
I tell my child she will get a treat for eating.	.243	.303*	.379**
I remind my child to keep eating her food.	.304*	.287*	.277*
I tell my child he will get in trouble for not eating.	.037	.192	.335**
I struggle with my child to get her to eat.	.048	.260*	.219
I warn my child he will not get a treat if he does not eat.	.242	.247	.301*
I hand-feed my child to get her to eat.	.259*	.047	.289*
I say to my child, "Hurry up and eat your food."	.140	.082	-.097
I tell my child that she needs to eat an item on her plate.	-.008	-.009	.159
I tell my child I do not like that he is not eating.	.084	.083	.331**
I tell my child that I will reward her for eating with TV, playtime, or videogames.	.057	.231	.234
My child skips meals.	.041	.003	-.136
I beg my child to eat his food.	-.036	-.076	.168

published example



A tool can be reliable while *not* being valid

So, important to study both

reliability



consistency

reliability

consistency

time stability

test-retest reliability
reliability coefficient r



internal consistency

Cronbach coefficient alpha
confirmatory factor analysis



discrimination

item discrimination
index



difficulty

item difficulty
index





measure

item 1

item 2

item 3

item 4

item 5

parent
centered
feeding

Tell child to eat all their food

Hand feed child to get them to eat

Say “hurry up and eat”

Use bribes to get child to eat

Punish child for not eating

eats
vegetables

I eat vegetables

I eat snack foods like carrots

I eat more than one kind of
vegetable each day

I eat a vegetable at my main meal

I keep vegetables ready to eat



internal
consistency

reliability

factor analysis

1. I get my child to eat by explaining that the food is good for him.
2. My child sits and eats with an adult.
3. I tell my child she will get a treat for eating.
4. I plan meals.
5. I ask my child to try a little bit of a new food.
6. I remind my child to keep eating her food.
7. I prepare at least one food that I know my child will eat.
8. I praise my child for eating.
9. I help my child with eating (cut food, cool the food).
10. I get my child to eat by making food fun.
11. I tell my child he will get in trouble for not eating (no toys, time out).
12. My child eats a snack at about the same time every day.
13. My child eats dinner at about the same time every day.
14. I struggle with my child to get her to eat (pick her up and put her in the chair).
15. I warn my child he will not get a treat if he does not eat.
16. I say good things about the food my child is eating.
17. I ask my child to pick from foods already cooked.
18. I hand-feed my child to get her to eat.
19. I say to my child, "Hurry up and eat your food".
20. I tell my child that she needs to eat an item on her plate ("Eat your chicken").
21. I tell my child I do not like it that he is not eating.
22. I ask my child questions about the food she is eating.
23. I let my child serve himself.
24. I tell my child that I will reward her for eating with TV, playtime, or videogames.
25. A TV is on when my child eats.
26. My child skips meals.
27. I beg my child to eat his food.

child centered behaviors

1. I get my child to eat by explaining that the food is good for him.
2. My child sits and eats with an adult.
4. I plan meals.
5. I ask my child to try a little bit of a new food.
7. I prepare at least one food that I know my child will eat.
8. I praise my child for eating.
9. I help my child with eating (cut food, cool the food).
10. I get my child to eat by making food fun.
12. My child eats a snack at about the same time every day.
13. My child eats dinner at about the same time every day.
16. I say good things about the food my child is eating.
17. I ask my child to pick from foods already cooked.
22. I ask my child questions about the food she is eating.
23. I let my child serve himself.

($\alpha = 0.80$)

parent centered behaviors

3. I tell my child she will get a treat for eating.
6. I remind my child to keep eating her food.
11. I tell my child he will get in trouble for not eating (no toys, time out).
14. I struggle with my child to get her to eat (pick her up and put her in the chair).
15. I warn my child he will not get a treat if he does not eat.
18. I hand-feed my child to get her to eat.
19. I say to my child, "Hurry up and eat your food".
20. I tell my child that she needs to eat an item on her plate ("Eat your chicken").
21. I tell my child I do not like it that he is not eating.
24. I tell my child that I will reward her for eating with TV, playtime, or videogames.
26. My child skips meals.
27. I beg my child to eat his food.

($\alpha = 0.81$)

internal
consistency

reliability

Internal consistency established
confirmatory factor analysis

Mi Child at Mealtimes items
items consistently measure
the two scales of interest

> *Appetite*. 2019 May 1;136:62–69. doi: 10.1016/j.appet.2019.01.016. Epub 2019 Jan 21.

My Child at Mealtime Parent Self-Assessment of Food Related Behaviors: Validation With Mealtime Behaviors

Lenna L Ontai¹, Carolyn Sutter², Stephanie Sitnick³, Mical K Shilts⁴, Marilyn S Townsend⁵

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ABSTRACT

The importance of caregiver feeding styles on children's dietary outcomes is well documented. However, the instruments used to assess feeding style are limited by high literacy demands, making self-assessment with low-income audiences challenging. The purpose of the current study is to report on the development of My Child at Mealtime (MCMT), a self-assessment tool with reduced literacy demands, designed to measure feeding styles with parents of preschool-aged children. Cognitive interviews were conducted with 44 Head Start parents of 2–5 year old children to develop question wording and identify appropriate visuals. The resulting tool was administered to 119 ethnically diverse, low-income parents of 2–5 year old children. Factor analysis resulted in a two-factor structure that reflects responsiveness and demandingness in a manner consistent with existing assessment tools. Results indicate the final visually enhanced MCMT self-assessment tool provides a measure of parenting style consistent with existing measures, while reducing the literacy demand.

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Obesity rates for preschool-age children have dramatically increased in the last two decades. In the U.S., obesity rates in 2–5 year olds have risen continuously since 1980 (Fryar, Carroll, & Ogden, 2012). While the most recent data reflects a significant decline in this rate, down to 8% from the previous peak of more than 12% in 2010 (Ogden, Carroll, Kit, & Flegal, 2012), the rates remain high for African American (11.3%) and Hispanic (16.7) 2–5 year olds. Furthermore, low-income children this age demonstrate an even higher rate of obesity (14.4% of 2–4 year olds) than the general population (10.4% of all U.S. 2–5 year olds) (Dalenius, Borland, Smith, Polhamus, & Grummer-Strawn, 2012). Such statistics reflect an ongoing need for obesity prevention intervention efforts tailored for low-income ethnically diverse families with young children. A report by the Institute of Medicine (2005) notes that the environmental conditions in which these obesity trends are established start early in life and are largely influenced by parents and other adults that care for young children. As such, there has been an increased interest in understanding the processes by which parenting contributes to the development of obesity in

young children (Sleddens, Gerards, Thijs, De Vries, & Kremers, 2011), and incorporating parent education into prevention intervention programs for parents of young children (Gerards, Sleddens, Dagnelie, De Vries, & Kremers, 2011).

Recent efforts toward understanding parent contributions to child obesity have differentiated between general parenting styles and parenting practices related to feeding, with each making significant yet distinct contributions to the development of children's dietary behaviors. In contrast to parenting practices which focus on directly influencing what a child eats (e.g. restriction of food, serving fruits and vegetables, pressure to eat), general parenting is considered the "style" that parents adopt in their interactions with their children and is considered to set the contextual emotional environment in which specific interactions between parents and children take place (Darling & Steinberg, 1993). Parents can fall into one of four general parenting "styles" based on two dimensions: demandingness (i.e. attempts to control children's behavior: high or low control) and responsiveness (i.e. acceptance of children's demands and needs: child-centered or parent-centered) (Maccoby & Martin, 1983). Based on ratings of parents' behaviors with their children on these two dimensions, parents can be classified as "authoritative", "authoritarian", "permissive", or "neglectful". In this model, authoritative parenting, characterized by

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published example



Table 4

No.	Item Content	Item Difficulty Index	Item Discrimination Index	Reliability /Stability	Coefficient of Variation (%)
1	Parent buys vegetables	.84	.54	.31	19
2	Child snacks on apples and carrots	.71	.54	.57	31
3	Child eats vegetables at main meal	.51	.28	.47	30
4	Child eats ≥ 1 kind of vegetable	.51	.54	.60	41
5	Child eats fruit	.67	.55	.57	28
6	Parent buys fruit	.87	.60	.45	21
7	Fruit ready for child to eat	.51	.59	.60	27
8	Child drinks milk	.65	.08	.47	32
9	Child drinks soda	.82	.28	.46	18
10	Child drinks sports drinks	.83	.30	.52	22
11	Child eats candy, cake, and cookies	.79	.23	.55	15
12	Milk type	.63	.21	.69	27
13	Child eats chips	.87	.25	.59	18
14	Parent trims fat from meat	.70	.29	.49	42
15	Parent eats with child	.83	.30	.60	25
16	Child watches x hours of television	.69	.24	.44	24
17	Computer games	.90	.12	.34	15
18	Child plays instead of television	.67	.22	.32	31
19	Bedtime	.62	.19	—	38
19-item Healthy Kids		.75	NA	.74	NA

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An Obesity Risk Assessment Tool for Young Children: Validity With BMI and Nutrient Values

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ABSTRACT

Objective: Demonstrate validity and reliability for an obesity risk assessment tool for young children targeting families' modifiable home environments.

Design: Longitudinal design with data collected over 100 weeks.

Setting: Head Start and the Special Supplemental Nutrition Program for Women, Infants, and Children.

Participants: Parent-child pairs (n = 133) provided food behavior assessments; 3 child-modified, 24-hour dietary recalls; 3 ≥ 36-hour activity logs; and measured heights and weights.

Main Outcome Measure: Five measures of validity and 5 of reliability.

Results: Validity was excellent for the assessment tool, named Healthy Kids, demonstrating an inverse relationship with child body mass index percentile-for-age ($P = .02$). Scales were significantly related to hypothesized variables ($P \leq .05$): fruit or vegetable cup equivalents; folate; vitamins A, C, and D; β -carotene; calcium; fiber; sugar; screen, sleep, and physical activity minutes; and parent behaviors. Measures of reliability were acceptable.

Conclusions and Implications: Overall, children with higher Healthy Kids scores had a more healthful profile as well as lower body mass index percentiles-for-age 1.5 years later. Healthy Kids has potential for use by nutrition professionals as a screening tool to identify young children most at risk for excess weight gain, as an evaluation to assess intervention impact, and as a counseling tool to tailor intervention efforts. Future research should include validation in other settings and with other populations.

Key Words: evaluation, obesity, overweight, preschool, risk assessment (*J Nutr Educ Behav.* 2018;50:705-717.)

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INTRODUCTION

Parents have direct influence over their children's physical, food, and social environments.¹ Yet, many families' nutrition and parenting practices and lifestyle behaviors create home environments that set young children on trajectories for unhealthy weight

gain. Among low-income preschoolers, 31% are overweight or obese in the US.² In response to the staggering obesity rates among children, Congress authorized federal programs to include an obesity prevention focus in their education programs for families with young children. These programs include *Head Start*;

the *Special Supplemental Nutrition Program for Women, Infants, and Children* (WIC);³ the *Supplemental Nutrition and Assistance Program-Education* (SNAP-Ed);⁴ and the *Expanded Food and Nutrition Education Program* (EFNEP).⁵ These 4 programs have a presence in all or most low-income communities in the US. Consequently, they have the potential to affect obesity prevalence among participants.⁷ Recognizing that this young age may be ideal for inter-

published example

validity

vs

reliability

accuracy

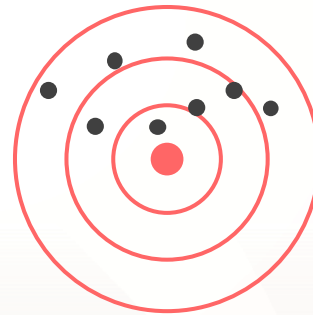
consistency



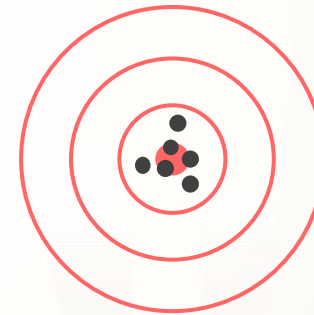
reliable
not valid



low validity
low reliability



not reliable
not valid



reliable
and valid



considerations



administration mode

self

paper + pencil

online, electronic

group

interview

one-on-one in person

one-on-one phone

guided group

validity

content	experts	Identify & select content domains— behaviors relevant to target clientele	initial
face	client	Tailor to incorporate client's vocabulary and context	initial
construct	client	For scales with no objective measures [eg, attitudes, beliefs, self-efficacy]	stages 1-6
convergent	client	Determine link to diet	post-initial
criterion	client	Determine link to health	post-initial

reliability

stability	client	Does the item give same response over time for the same client?	mid
internal	client	Does the items in the scale all contribute to the construct?	mid

other

sensitivity to change	client		final
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validity

VS

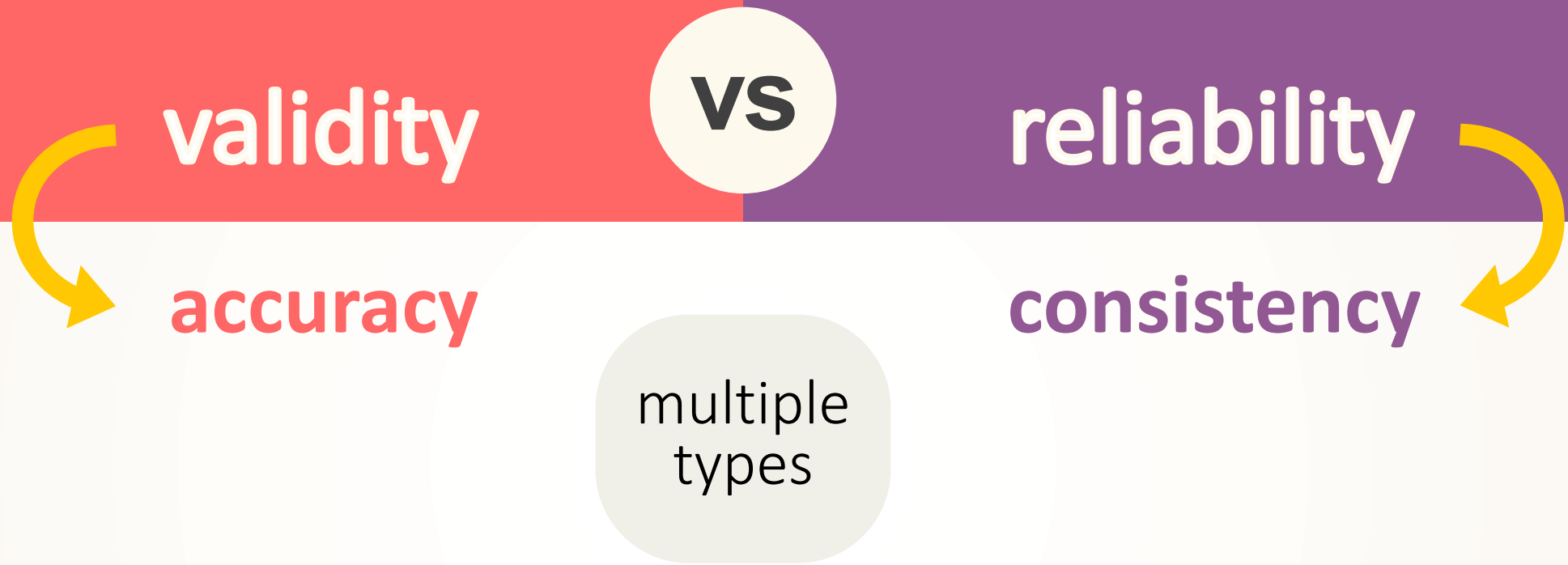
reliability

Type	Source	Collection Times	Cost
Concurrent	Parent psychosocial mediators (F&V)	1X	\$
Concurrent	Parent feeding behaviors	1X	\$
Convergent	PA, screen, sleep logs	3X	\$\$\$
Convergent	Child 24-hr diet recalls	3X	\$\$\$
Predictive	Child BMI	3X	\$\$\$\$
Criterion [upcoming paper]	Blood biomarkers	3X	\$\$\$\$\$

Type	Collection Times	Cost
Internal consistency	1X	\$
Item difficulty index	1X	\$
Item discrimination index	1X	\$
Coefficient of variation	1X	\$
Temporal stability / test retest	2X	\$\$



summary



Why multiple types instead of 1?

What does each type tells you?

And what does it not tell you?



Rethinking the gold standard.

Does one type make a tool valid?



Look for multiple approaches to
support validity of your tool

If a tool has content or face
validity, is it valid?

think about



key messages

Important to establish the trustworthiness of the tool through multiple assessment approaches.

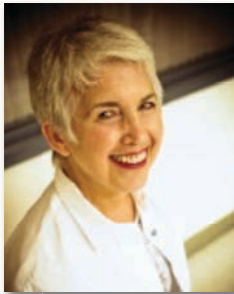
Look beyond self-report: use objective approaches.

Each type of validity provides different information about the **accuracy** of tool.

Each type of reliability provides different information about the **consistency** of tool.

thank you!

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Questions?

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