

## Study Objectives

- The main objective of this project is to assess the validity of self-reported relative childhood body size at age 12 by comparing self-report to a rater evaluation based on childhood photographs.
- We will also examine whether participant race/ethnicity and household % poverty affect self-reported relative childhood body size.

## Background

### Breast Cancer and Body Size

- The prevalence of obesity has increased in the United States in recent decades and is associated with a myriad of negative health outcomes, including breast cancer<sup>[4]</sup>. Obesity at the time of breast cancer diagnosis is linked to poorer prognosis and increased recurrence.
- The Stunkard scale (Figure 1) – a scale consisting of nine body figures ranging from underweight (1) to overweight (9) – is frequently used to assess relative recalled childhood body size<sup>[3]</sup>.

### Differences of Self-Reported Body-Size by Race and SEP

- Self-reported body-size is known to vary based on race, socioeconomic position, and other factors. However, studies disagree on how they vary.
  - One study concludes that Non-Hispanic Black (NHB) women have a higher rate of under-reporting recalled body size than Non-Hispanic White (NHW) women<sup>[2]</sup>.
  - Another study concludes that NHB women and poorer women tend to over-report body size while NHW women and wealthier women tend to under-report body size<sup>[7]</sup>.

### Validation of Recalled Body Size Using Stunkard Figures

- A study involving adolescent girls tested the use of body rating and figure-rating scales and found a correlation ( $r=.63$  to  $.93$ ) between silhouette ratings and measured body mass<sup>[5]</sup>.
- A second study used photos ( $n=23$ ) to validate height and concluded that measured height and estimated height correlated with a Pearson coefficient of 0.99 ( $p<0.0001$ )<sup>[6]</sup>.
- Another study tested the validity of recalled body size using figure-rating scales and found a correlation ( $r=.77$ ) between silhouette ratings, recalled BMI, and actual BMI<sup>[3]</sup>.
- A fourth study used Stunkard figures to assess the validity of body size figures in-person and on video. It was found that both forms of evaluation showed high correlation ( $r=.82$ ). Additionally, in-person ratings were strongly correlated with BMI ( $r=.91$ )<sup>[1]</sup>.

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## Methods

### Study Population

- Study participants were randomly-selected from the Young Women's Health History Study (YWHHS) ( $N=91$ ), a socioeconomically diverse, population-based case-control study of breast cancer among non-Hispanic Black and White women aged 20-49. Women with ( $n=28$ ) and without ( $n=63$ ) breast cancer were included in analyses.

### Development of Photo Evaluation Survey

- YWHHS team members developed a detailed photo evaluation protocol and a Qualtrics survey for study evaluators to use to objectively evaluate the relative body size of study participants based on childhood photographs from 'head to toe' of study participants.

### Body Size Assessment

- Stunkard figures (Figure 1)<sup>[3]</sup> were used to assess relative body size at age 12 and categorized as low (1- $<3$ ), medium (3- $<6$ ) and overweight (6+).

### Participant Assessment:

- During an in-home interview, participants were shown Stunkard body size figures (Figure 1) and asked to rate their body size relative to other children their age at age 12.

### Evaluator Assessment:

- Each photo provided by participants was objectively assessed and assigned a Stunkard value (Figure 1) by two evaluators.

### Statistical Analyses

- Evaluator assessments were averaged and compared to the participants' self-assessment. Whether factors that may affect recall or weight perception, such as race/ethnicity and household percent poverty, modified these correlations was also assessed. These comparisons were analyzed using Cohen's Kappa Coefficient.

### ADOLESCENT FIGURES

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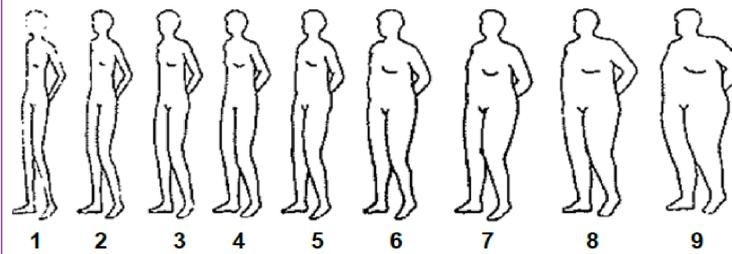


Figure 1. Adolescent Stunkard figures used for reporting body size<sup>[3]</sup>.

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## Results

Table 1. Inter-rater agreement of relative body size at age 12 years.

| Rater 1 Category  | Rater 2 Category |           |         | Total |
|-------------------|------------------|-----------|---------|-------|
|                   | 1: Low           | 2: Medium | 3: High |       |
| 1: Low            | 5                | 12        | 0       | 17    |
| 2: Medium         | 8                | 61        | 2       | 71    |
| 3: High           | 0                | 1         | 2       | 3     |
| Total             | 13               | 74        | 4       | 91    |
| Kappa Coefficient | 0.34             |           |         |       |

- Inter-rater agreement between evaluator assessed Stunkard body size at age 12 showed fair agreement (Kappa=0.34).

Table 2. Average of rater 1 and rater 2 compared to participant self-report at age 12 years.

| Rater Category    | Self-Reported Category |           |         | Total |
|-------------------|------------------------|-----------|---------|-------|
|                   | 1: Low                 | 2: Medium | 3: High |       |
| 1: Low            | 15                     | 3         | 1       | 19    |
| 2: Medium         | 25                     | 38        | 6       | 69    |
| 3: High           | 0                      | 1         | 2       | 3     |
| Total             | 40                     | 42        | 9       | 91    |
| Kappa Coefficient | 0.34                   |           |         |       |

- Agreement between rater photo-assessed and participant self-reported Stunkard body size showed fair agreement (Kappa=0.34)

Table 3. Rater average compared to participant self-report at age 12 years by race.

| Rater Category            | Self-Reported Category |           |         | Total |
|---------------------------|------------------------|-----------|---------|-------|
|                           | 1: Low                 | 2: Medium | 3: High |       |
| <b>Non-Hispanic Black</b> |                        |           |         |       |
| 1: Low                    | 3                      | 2         | 1       | 6     |
| 2: Medium                 | 6                      | 8         | 2       | 16    |
| 3: High                   | 0                      | 0         | 0       | 0     |
| Total                     | 9                      | 10        | 3       | 22    |
| Kappa Coefficient         | 0.22                   |           |         |       |
| <b>Non-Hispanic White</b> |                        |           |         |       |
| 1: Low                    | 12                     | 1         | 0       | 13    |
| 2: Medium                 | 19                     | 30        | 4       | 53    |
| 3: High                   | 0                      | 1         | 2       | 3     |
| Total                     | 31                     | 32        | 6       | 69    |
| Kappa Coefficient         | 0.37                   |           |         |       |

Table 4. Rater average compared to participant self-report at age 12 years by household percent poverty.

| Rater Category    | Self-Reported Category |           |         | Total |
|-------------------|------------------------|-----------|---------|-------|
|                   | 1: Low                 | 2: Medium | 3: High |       |
| <b>&lt;200%</b>   |                        |           |         |       |
| 1: Low            | 1                      | 1         | 1       | 3     |
| 2: Medium         | 5                      | 11        | 1       | 17    |
| 3: High           | 0                      | 0         | 0       | 0     |
| Total             | 6                      | 12        | 2       | 20    |
| Kappa Coefficient | 0.04                   |           |         |       |
| <b>200%+</b>      |                        |           |         |       |
| 1: Low            | 12                     | 2         | 0       | 14    |
| 2: Medium         | 19                     | 25        | 5       | 49    |
| 3: High           | 0                      | 1         | 2       | 3     |
| Total             | 31                     | 28        | 7       | 66    |
| Kappa Coefficient | 0.36                   |           |         |       |

- Agreement between rater photo-assessed and participant self-reported Stunkard body size shows fair agreement by race (Kappa=0.22-0.37), and poor agreement by household percent poverty (Kappa=0.04-0.36).

## Conclusions

- There is evidence, based on this study, that childhood photos may provide a useful correction factor for examining self-reported childhood body size based on Stunkard figures.
- Rater evaluations and participant self-report of relative childhood body size at age 12, however, appeared to be more discordant among black women and women < 200% household poverty.
- Future analyses will expand the study sample size.