

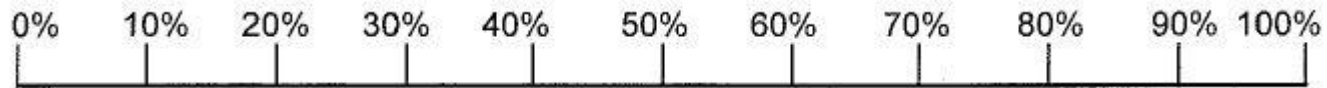
Use of the Visual Analogue Scale to Measure Antiretroviral Adherence: A Meta-Analysis

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Measuring Adherence



Visual Analogue Scale (VAS)



1. Research Questions:

- What is the extent of concordance between VAS and other measures of medication adherence?
- Can VAS scores predict outcomes of interest such as viral load?
- What design or implementation characteristics optimize or undermine VAS usage?

2. Data Collection

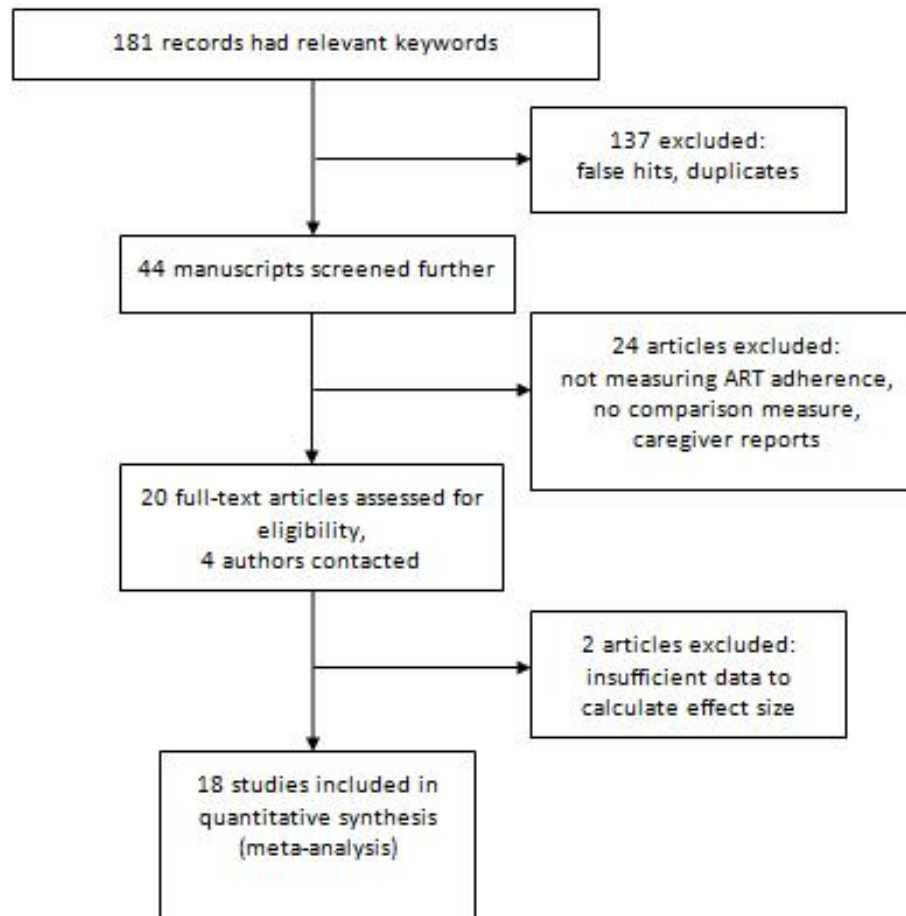
- **Inclusion Criteria:**
 - Studies of PLWH prescribed ART
 - Reports a measurement of medication adherence by VAS comparable with at least one comparable measure of medication adherence.
 - Sufficient data to calculate effect size
- **Exclusion:**
 - Caregiver reports

Literature Search*

- **Search Terms:** permutations of VAS (e.g., analog, analogue) and adherence
- **Databases Searched:** PsycINFO, PubMed/Medline, CINAHL
- **Reverse search:** references of all relevant studies

*English language journals only

Search Outcomes



Geographic Distribution of Included Studies



3. Results: Participant Characteristics

- $N=5501$
- 36.1% female ($k=17$)
- Mean age ($k=15$) 38.8 years
- Education ($k=11$)majority less than HSD or eq.
- 46.8% ART naïve ($k=10$)

3. Results: Participant Characteristics

- Racial/Ethnic proportions reported ($k=17$)

Category	proportion (%)	k
African	41.8	6
Asian	40.8	5
African-American	13.7	5
Latin-American	1.7	3
Caucasian	1.9	4

3. Results: Study Characteristics

- 18 Peer-reviewed journal publications
- Years of Data Collection
 - Median: 2006
 - Range: 1996-2010
 - Mode: 2010
- Design
 - 61.1% ($k=11$) adherence measurement aim
 - 38.9% ($k=7$) other observational study

3. Results: Study Characteristics

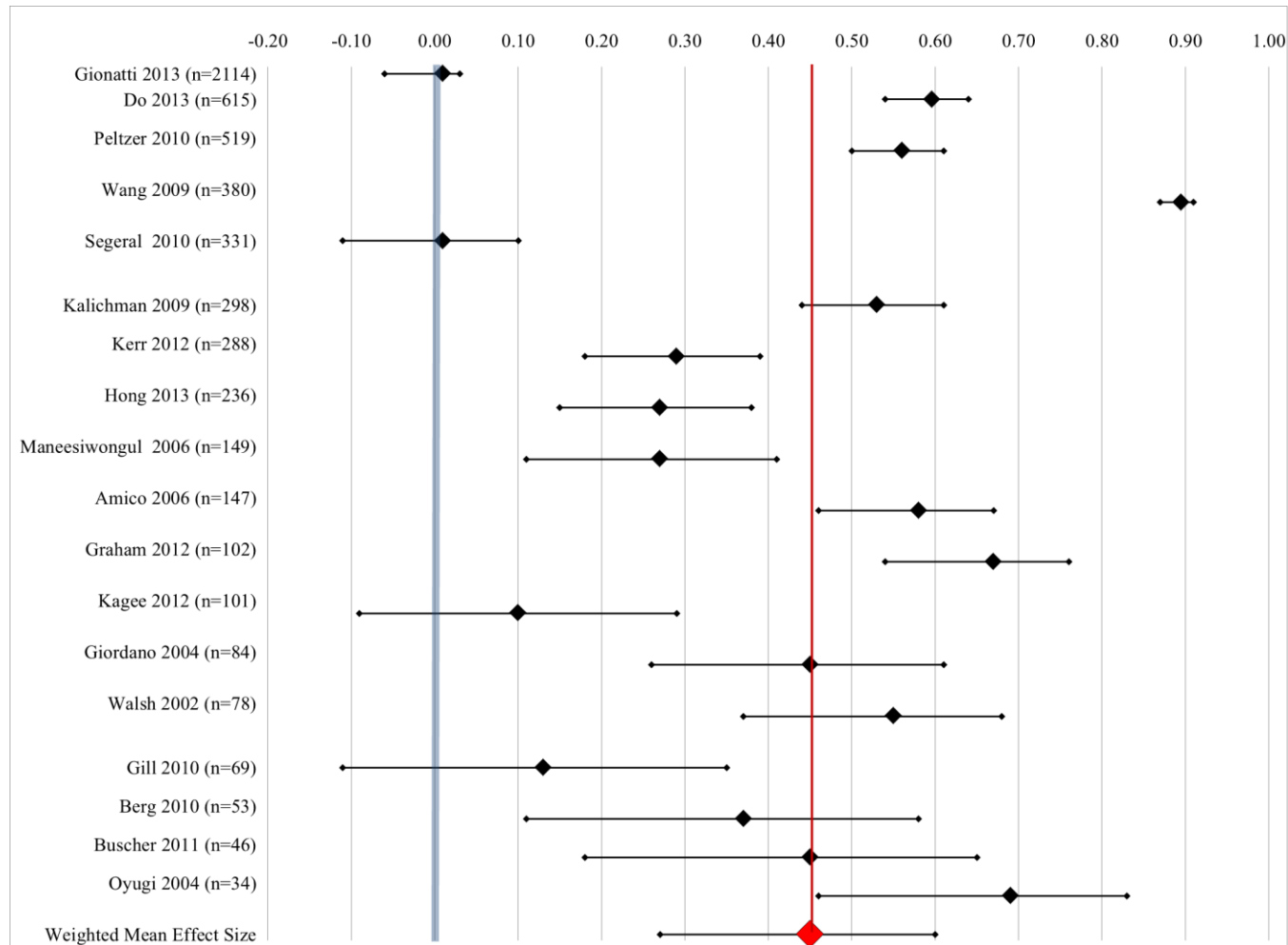
Comparison Measure	<i>k</i>
Self-report	8
Pill Count	5
Electronic Data Monitor	4
Pharmacy Refill	2
Viral Load	11

- Comparison measures reported per study
 - Range: 1-4
 - Mean: 1.6
 - Median: 1.5
 - Mode: 1

Mean Effect Size

Comparison Measure	<i>k</i>	<i>r</i> (95% CI)	OR (95% CI)	<i>I</i> ² (95% CI)
Self-report	8	0.56 (0.42, 0.64)	2.11 (1.62, 2.74)	96.98 (95.57, 97.94)
Pill count	5	0.65 (0.52, 0.71)	2.80 (1.92, 4.10)	94.47 (89.87, 96.98)
Electronic drug monitoring	4	0.47 (0.19, 0.62)	1.76 (1.21, 2.53)	86.15 (66.21, 94.32)
Pharmacy refills	2	0.27 (0.16, 0.36)	1.34 (1.19, 1.50)	0 (0, 99.93)
Viral load	11	0.23 (0.12, 0.34)	1.27 (1.13, 1.44)	86.37 (77.45, 91.76)
Mean adherence overall	18	0.45 (0.27, 0.60)	1.62 (1.32, 2.00)	98.16 (97.72, 98.51)

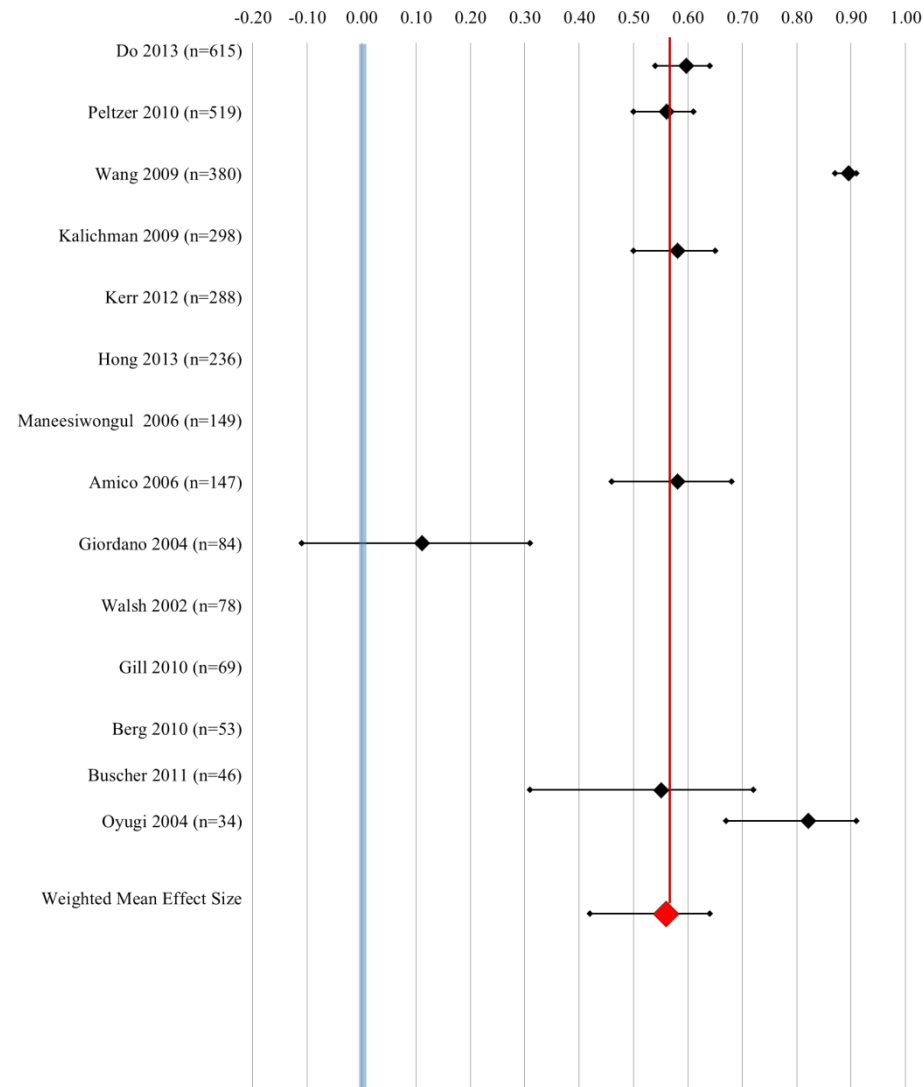
4. Synthesis: All Measures Forest Plot



Mean Effect Size

Comparison Measure	<i>k</i>	<i>r</i> (95% CI)	OR (95% CI)	<i>I</i> ² (95% CI)
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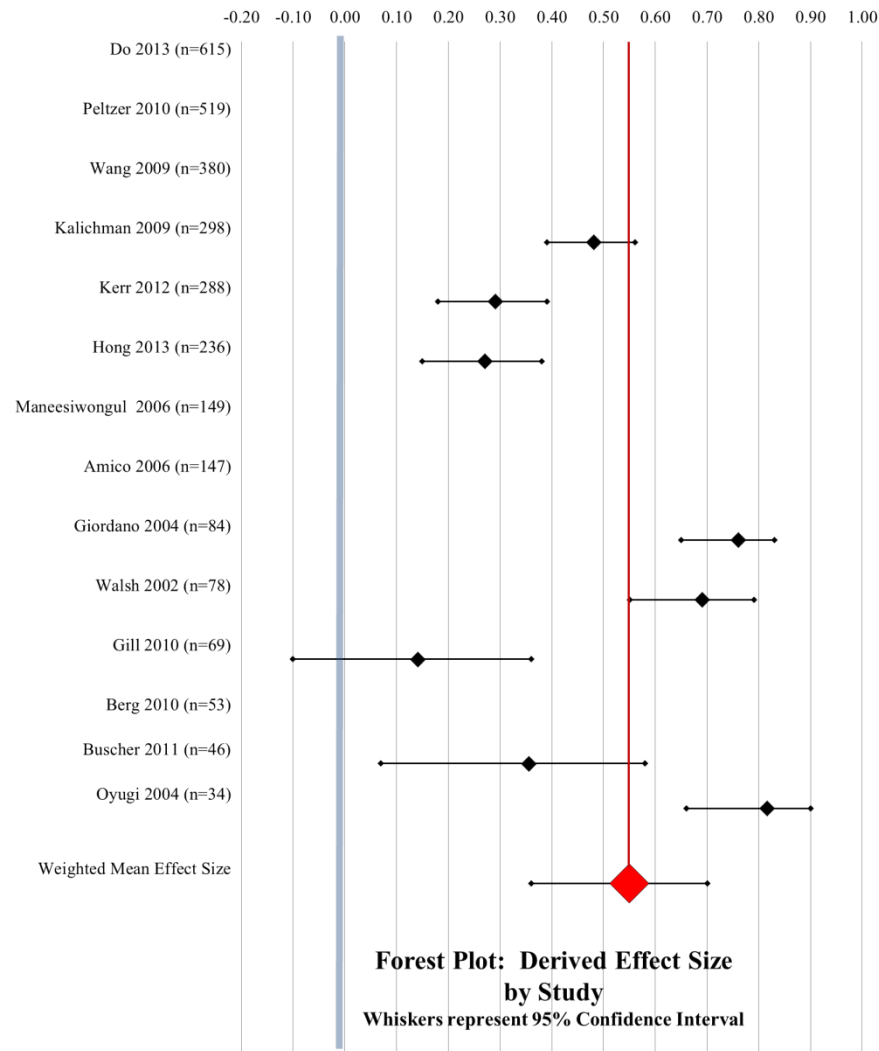
4. Synthesis: Self Report Forest Plot



Mean Effect Size

Comparison Measure	<i>k</i>	<i>r</i> (95% CI)	OR (95% CI)	<i>I</i> ² (95% CI)
Self-report	8	0.56 (0.42, 0.64)	2.11 (1.62, 2.74)	96.98 (95.57, 97.94)
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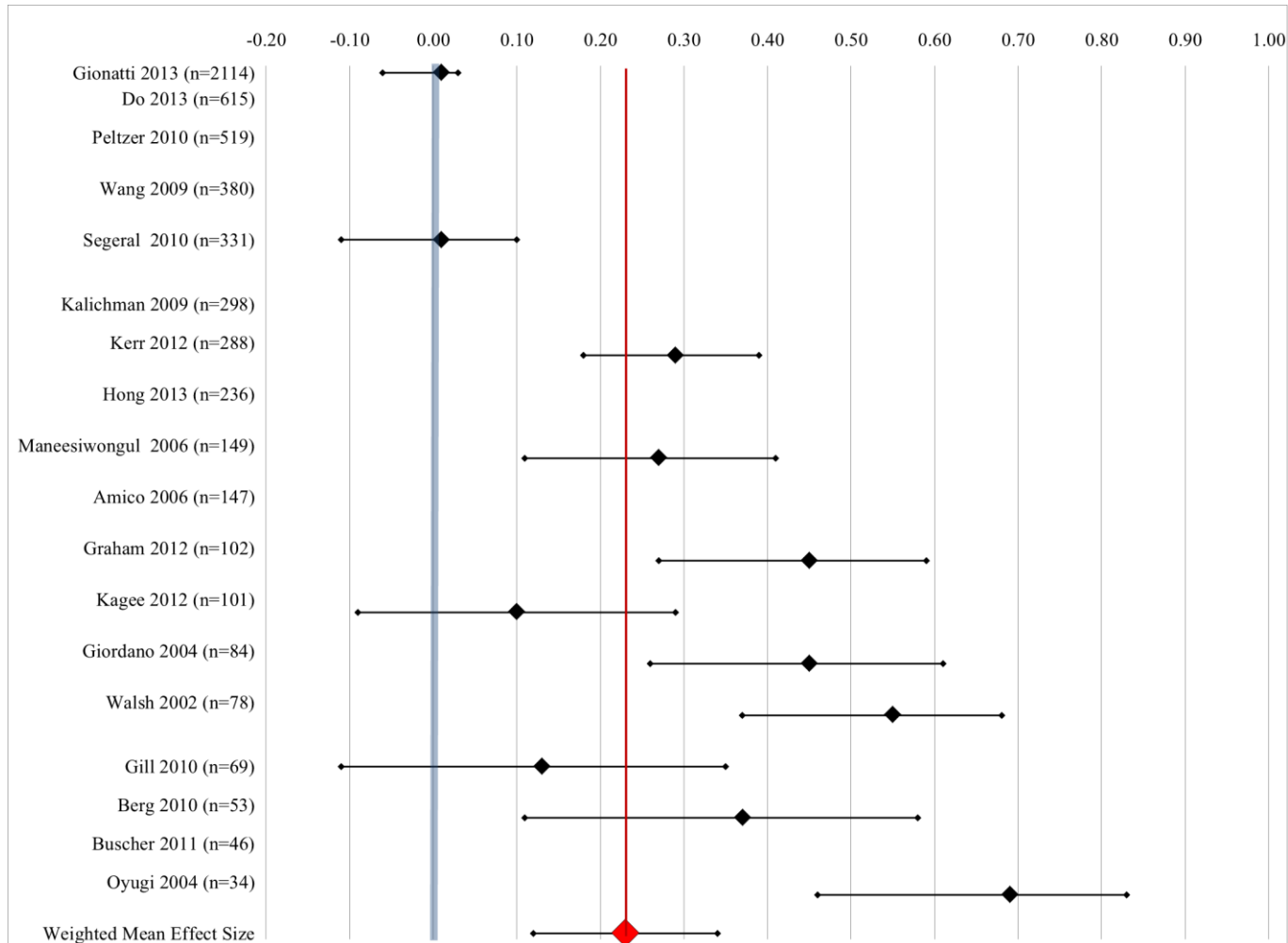
4. Synthesis: Objective Measures Forest Plot



Mean Effect Size

Comparison Measure	<i>k</i>	<i>r</i> (95% CI)	OR (95% CI)	<i>I</i> ² (95% CI)
Self-report	8	0.56 (0.42, 0.64)	2.11 (1.62, 2.74)	96.98 (95.57, 97.94)
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Mean adherence overall	18	0.45 (0.27, 0.60)	1.62 (1.32, 2.00)	98.16 (97.72, 98.51)

4. Synthesis: Viral Load Forest Plot



Sensitivity Analyses: aggregate ($k=18$)

Study Characteristic	OR (95% CI)	<i>k</i>
Study's explicit aims		
Psychometric evaluation of VAS	1.76 (1.44, 2.16)	11
Other observational study	1.44 (1.12, 1.84)	7
How was the VAS administered?		
Face-to-face interview	1.78 (1.37, 2.30)	6
ACASI	1.91 (1.32, 2.75)	3
Questionnaire	1.43 (1.15, 1.79)	9
Did staff seek to normalize missed doses?		
Yes	1.77 (1.25, 2.50)	4
No	1.58 (1.32, 1.90)	14

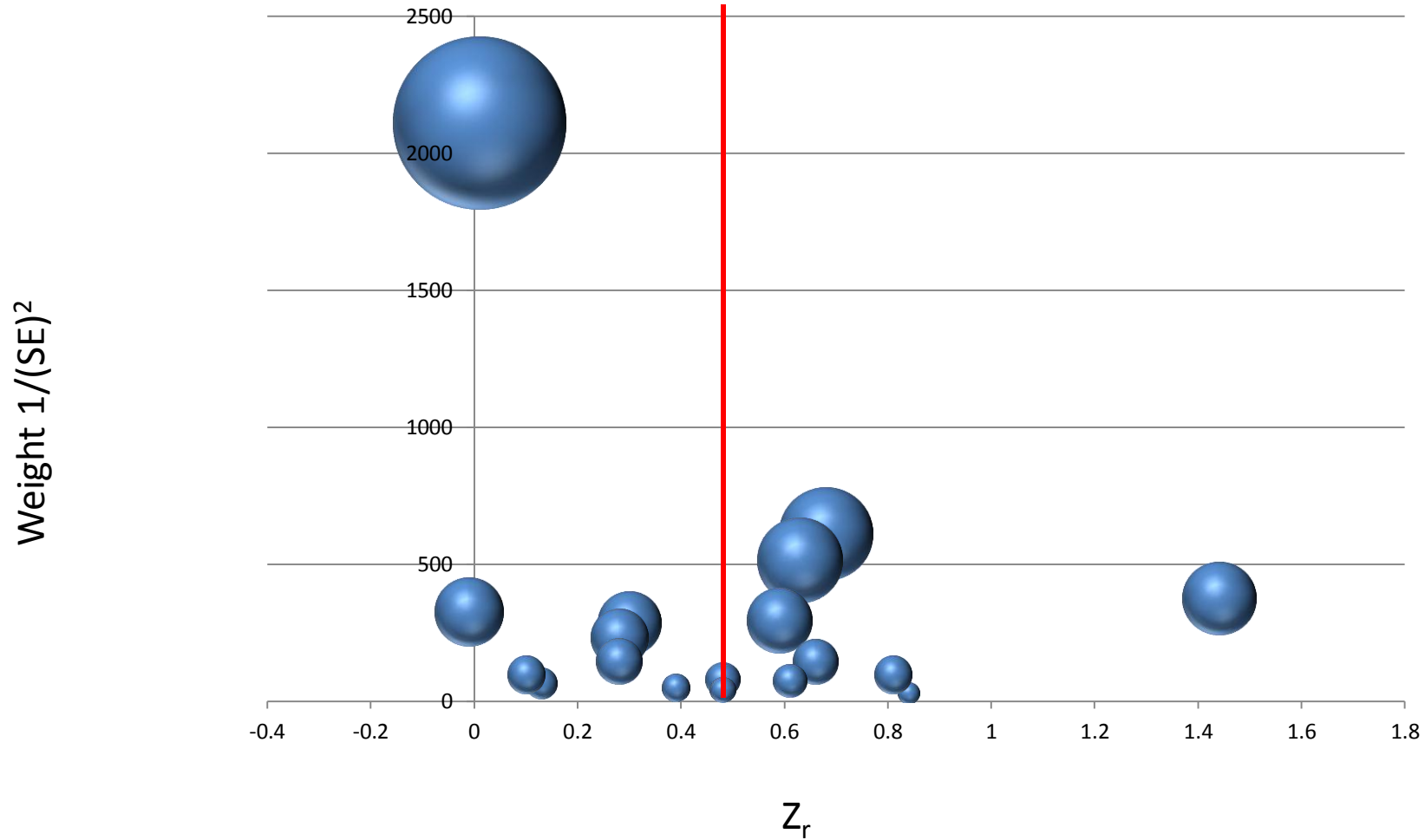
Sensitivity Analyses: viral load ($k=11$)

Study Characteristic	OR (95% CI)	k
Study's explicit aims		
Psychometric evaluation of VAS	1.38 (1.20, 1.58)	6
Other observational study	1.17 (1.02, 1.33)	5
How was the VAS administered?		
Face-to-face interview	1.43 (1.20, 1.70)	3
ACASI	--	0
Questionnaire	1.20 (1.07, 1.35)	8
Did staff seek to normalize missed doses?		
Yes	1.40 (1.06, 1.84)	2
No	1.25 (1.32, 1.90)	9

5. Publication Bias

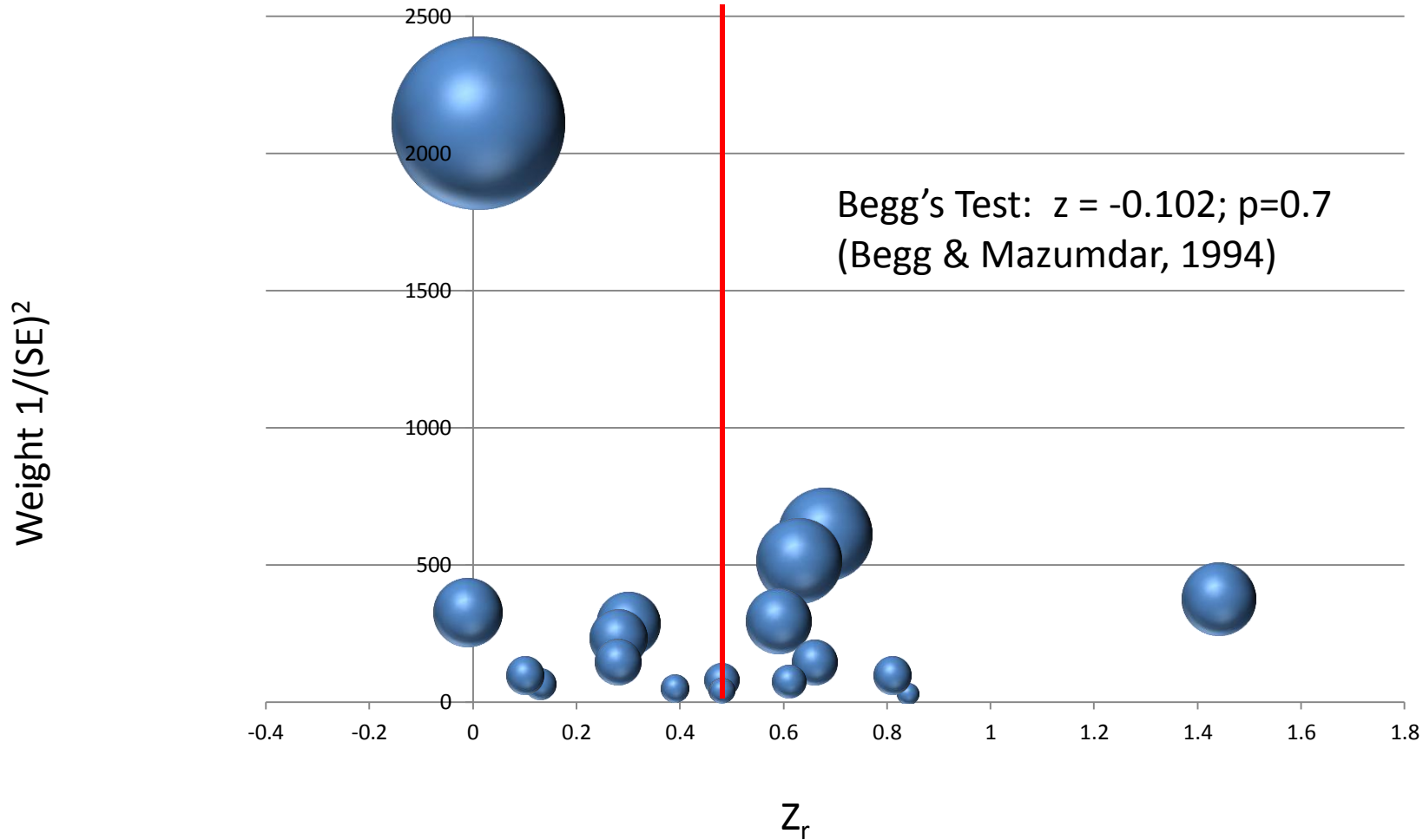


5. Testing for Publication Bias



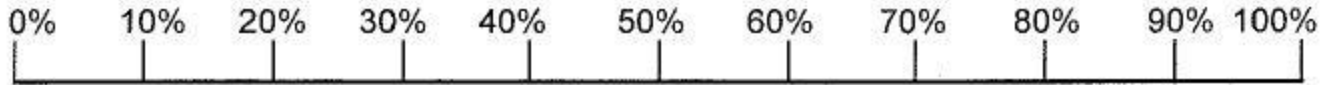
● Bubble diameter represents sample size (n)

5. Testing for Publication Bias



● Bubble diameter represents sample size (n)

6. Conclusions



- Significant associations with other variables
 - Strongest with self-report
 - Weakest with pharmacy refill records
- Significant associations with viral load
- The “how” of VAS administration may matter

Limitations

- Sample population less representative
- Sensitivity analyses are bivariate
- More literature needed, (your name here).

Acknowledgements

- National Institute of Mental Health:
 - Pre-doctoral fellowship T32MH074387-06
 - Seth C. Kalichman, PhD
- University of Connecticut
 - Major advisor: Dean G. Cruess PhD
- Center for Health, Intervention, & Prevention

Thank you.
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