

ویراست چهارم



دانشگاه علوم پزشکی و
خدمات بهداشتی درمانی کرمان

مرور ساختارمند و متاآنالیز

مفاهیم، کاربردها و محاسبات



SYSTEMATIC REVIEW & META-ANALYSIS

شورای نویسندگان

باسرپرستی

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Publication Bias in Systematic Reviews

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Publication bias

- The **likelihood** of finding studies is related to the **results** of those studies



Publication Bias

- “Publication bias refers to the **greater likelihood** that studies with **positive results** will be **published**”

- *JAMA* 2002;287:2825-2828



Publication Bias

- **Positive trials** are more likely to be **submitted** for publication
- **Positive trials** are more likely to be **published**
- **Positive trials** are more likely to be **published quickly**
- Stern and Simes *BMJ* 1997;315:640-645



Publication Bias

- Sterling study: 97% of papers published in 4 psychology journals showed statistically significant results at alpha level 5% !
- Dickersin study: compared published RCTs with unpublished ones .results:55%pub,15% unpub, favoring new therapy!
- Mahoney stuD:75 reviewers asked to review different versions of a fictitious manuscript. "introduction" & "methods" : identical, "results" & "discussion" : different (+/ambiguous /-). results of reviewers evaluation : manuscripts with "positive" results received higher average scores!



Publication Bias

- 1)...if they had reached sig.
- 2) positive result
- 3) interesting results for both reviewers & authors!
- 4) language bias (ENG) in being included in a meta-analysis.



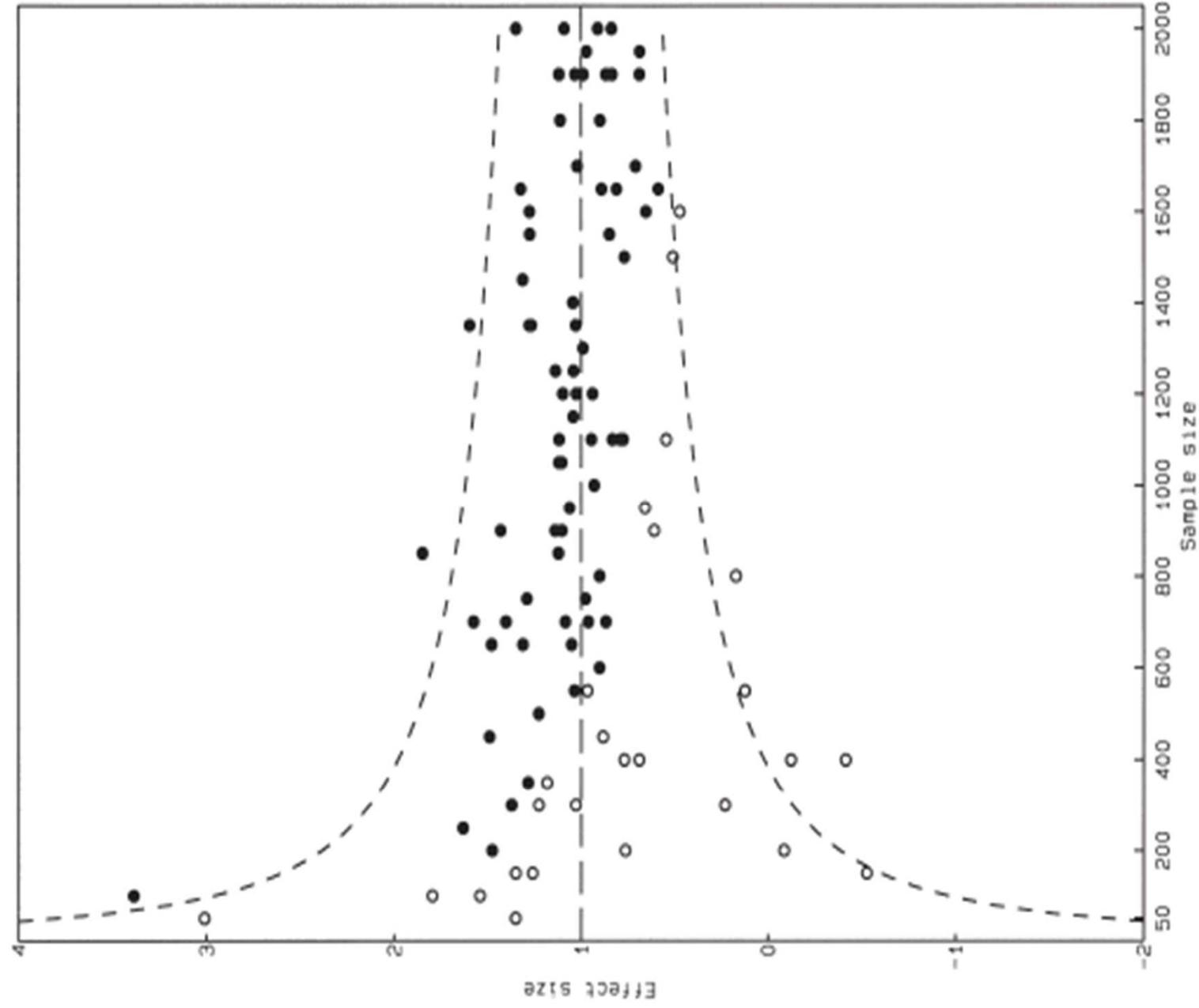
How to Bypass Publication Bias

- Searching **Libraries** for Thesis & Research Reports
- Searching **Registries**
- Searching **Grey Literature**
- Searching **especial Journals**



Funnel plots

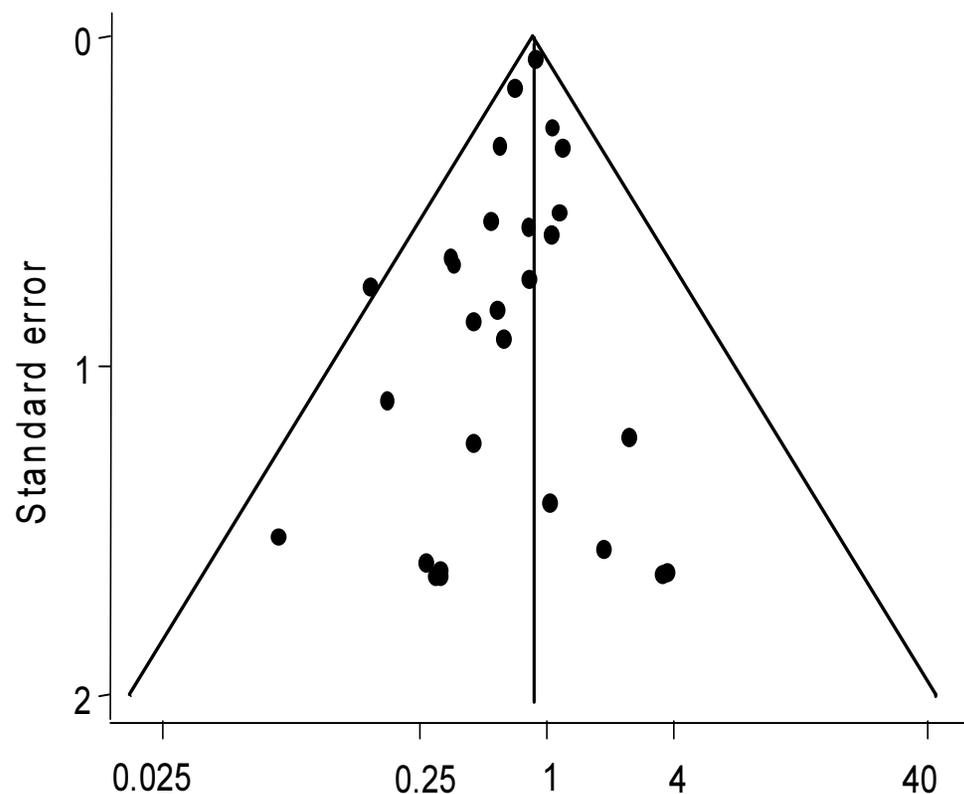
- A funnel plot is a scatter plot of **treatment effect (Effect Size)** against a measure of **study size**.



related funnel plot. (●) Effect size significantly increased ($P < 0.05$). (○) Effect size not significant. (—) Expected value of effect size. (---) 95% confidence region for samples.

Funnel plots

- A funnel plot is a scatter plot of **treatment effect (Effect Size)** against a measure of **study size**.



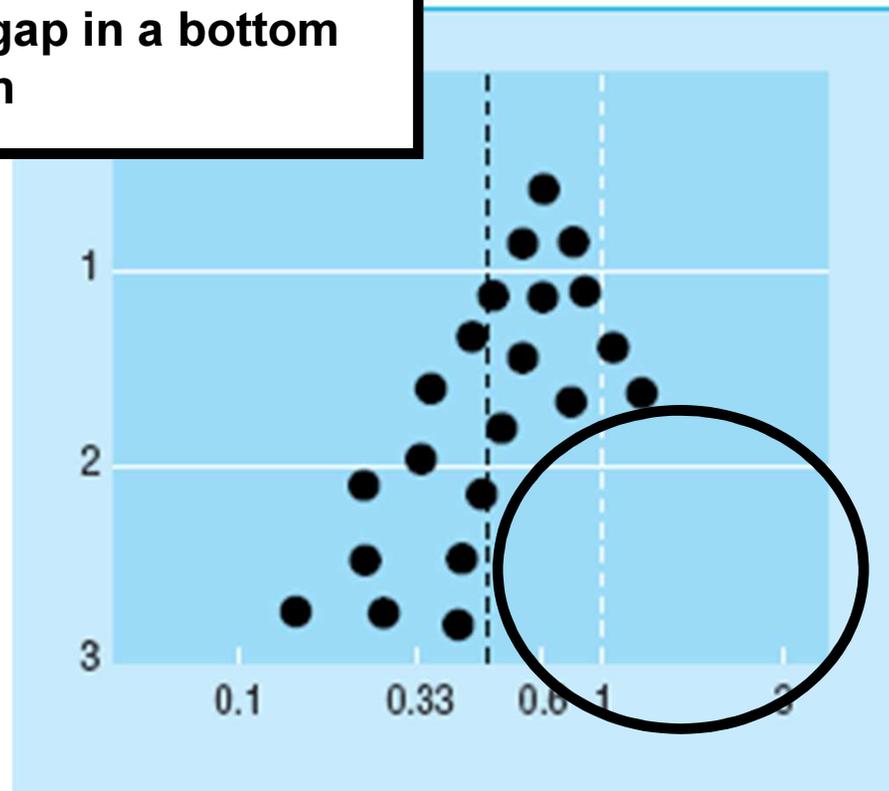


Why Funnel?

- **Precision** in the estimation of the true **treatment effect increases** as the **sample size increases**.
- Small studies scatter more widely at the bottom of the graph
- In the **absence** of bias the plot should resemble a **symmetrical inverted funnel**

Publication Bias

Asymmetrical appearance of the funnel plot with a gap in a bottom corner of the graph





Publication Bias

- In this situation the effect calculated in a meta-analysis will **overestimate** the treatment effect
- The more pronounced the asymmetry, the more likely it is that the amount of bias will be substantial.



Possible sources of asymmetry in funnel plots

1. Selection biases

- Publication bias

- Location biases

2. Poor methodological quality of smaller studies

- Poor methodological design

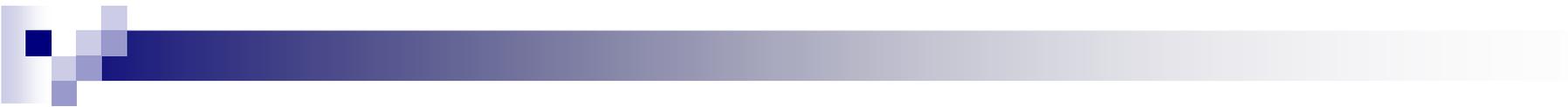
- Inadequate analysis

- Fraud

3. True heterogeneity

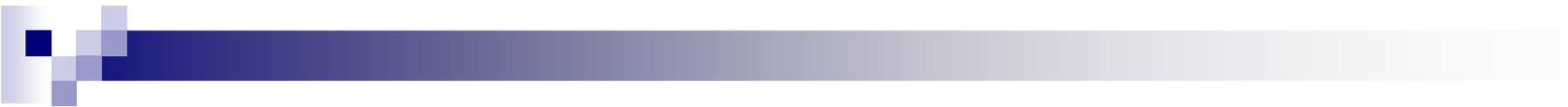
Size of effect differs according to study size (for example, due to differences in the intensity of interventions or differences in underlying risk between studies of different sizes)

4⁵. Chance



Publication Bias Approaches

- Attempt to **Retrieve all Studies**
- **Worst Case Adjustment**
 - Number of unpublished **negative studies** to negate a “positive” meta-analysis:
 - $X = [N \times (ES) / 1.645]^2 - N$
 - where: N = number of studies in meta-analysis,
 - ES = effect size
- Example:
 - If N = 25, and ES = 0.6 then X = 58.2
 - Almost **60 unpublished negative studies** would be required to **negate** the **meta-analysis** of 25 studies.



Poor methodological quality

- **Smaller studies** are, on average, conducted and analyzed with **less methodological rigor** than larger studies.
- **Trials of lower quality also tend to show larger treatment effects**
- Trials which, if conducted and analyzed properly, would have been 'negative' may thus become 'positive'

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