Meta-analysis of Predictors of Clerical Job Performance

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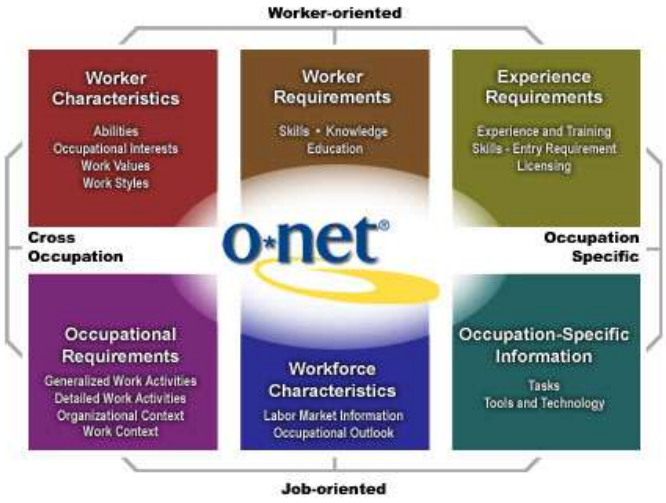
Research Questions

1. Have the validity estimates changed between Pearlman, Schmidt, and Hunter's (1980) study and the current study (2010)?
   - Hypothesis: Given the increased complexity of clerical jobs, the validity of predictors will increase.
2. Does mode of administration (computerized versus paper-and-pencil) moderate criterion-related validity?
   - Hypothesis: Given increased use of computers in clerical jobs, computer-administered tests will be more valid than paper and pencil tests.
3. What is the validity of personality predictors (e.g., Big 5)?
4. Are the results influenced by publication bias?

Changing Nature of Clerical Jobs

- Dictionary of Occupational Titles (DOT; 1977)
  - DOT code for Clerk, General is 209.562-010
  - Data code is at the Copying level which involves “Transcribing, entering, or posting data”
  - Things code is at the Operating-Controlling level and involves “Starting, stopping, controlling and adjusting the progress of machines or equipment”
- O*NET Update (Noble, Sager, Tsacoumis, Updegraff, & Donsbach, 2003)
  - Office Clerks, General (43-9061)
  - Importance ratings on a scale of 0-100
    - Active Listening, 78
    - Reading Comprehension, 73
    - Speaking, 64
    - Written Comprehension, 63
    - Writing, 59



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Predictors included in Study

- Abilities
  - General cognitive ability
  - Verbal ability
  - Quantitative ability
  - Reasoning ability
  - Perceptual speed
  - Performance tests
  - Clerical aptitude
- Personality
  - Extraversion
  - Agreeableness
  - Conscientiousness
  - Emotional stability
  - Openness to experience

METHOD

Literature Review

- Test reference sources
  - *Mental Measurements Yearbook* (Spies & Plake, 2005)
  - *Tests in Print* (Murphy, Plake, Impara, & Spies, 2002),
  - *Test Critiques* (Keyser & Sweetland, 1997)
- Test publishers (e.g., SHL, PSI)
- Calls for papers
  - Newsletters and e-mail solicitations (e.g., PTC/MW, SIOP)
  - Listservs (e.g., IPAC, LinkedIn)
- Computerized databases
  - *PsycINFO*
  - *Social Sciences Citation Index*
  - *Digital Dissertations*

Decision Rules

- Study was conducted in 1980 or later
- Study used a clerical or administrative sample
- Predictor fit in the taxonomy
- Criterion was performance ratings
- Study reported statistics needed to conduct a meta-analysis
- Administration procedures were similar to actual candidate testing
- Criterion (ratings) collected at two points in time, we coded only the later one
- The study must report all correlations for a given scale, not just the statistically significant ones

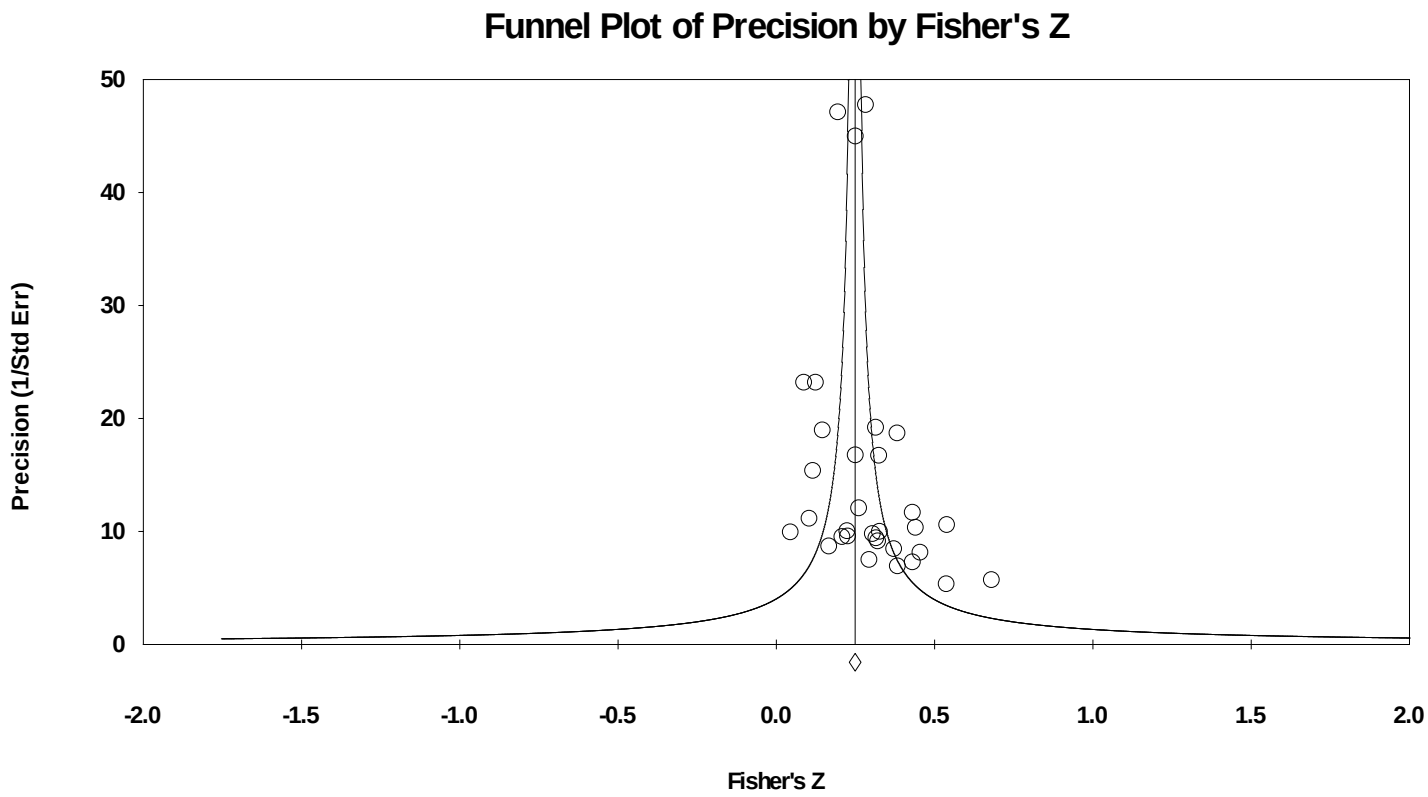
Interrater Agreement

- 2 coders
- 3 data points for each study
  - *N* (number of people)
  - *r* (validity of the predictor for that study)
  - predictor taxonomy category
- 746 data points
- 40 disagreements
- 95% level of agreement

Meta-analytic Techniques

- Hunter and Schmidt's most recent meta-analytic program was used to analyze the data (Schmidt & Le, 2005)
- Only code one validity per sample, if more than one was reported, we computed composites (Ghiselli, Campbell, & Zedeck, 1981)
- Corrections for artifacts using distributions (Pearlman et al., 1980)
  - Criterion unreliability
  - Range restriction
- Publication bias (Duval & Tweedie, 2000a; 2000b)
  - Trim and fill

Example of Asymmetrical Distribution



RESULTS

Results—Current Study vs. Pearlman et al.

General Mental Ability	N	k	$\bar{r}$	$\hat{\rho}$
Current (2010)	1,260	9	.27	.52
Pearlman (1980)	17,339	194	.26	.52

Results—Current Study vs. Pearlman et al.

Verbal Ability	N	k	$\bar{r}$	$\hat{\bar{\rho}}$
Current (2010)	11,238	32	.24	.48
Pearlman (1980)	39,187	450	.18	.39

Results—Current Study vs. Pearlman et al.

Quantitative Ability	N	k	$\bar{r}$	$\hat{\bar{\rho}}$
Current (2010)	11,920	30	.21	.42
Pearlman (1980)	39,584	453	.23	.47

Results—Current Study vs. Pearlman et al.

Reasoning Ability	N	k	$\bar{r}$	$\hat{\bar{\rho}}$
Current (2010)	7,694	20	.22	.45
Pearlman (1980)	11,586	116	.18	.39

Results—Current Study vs. Pearlman et al.

Perceptual Speed	N	k	$\bar{r}$	$\hat{\bar{\rho}}$
Current (2010)	10,680	37	.25	.50
Pearlman (1980)	70,935	882	.22	.47

Results—Current Study vs. Pearlman et al.

Performance Tests	N	k	$\bar{r}$	$\hat{\bar{\rho}}$
Current (2010)	739	8	.29	.56
Pearlman (1980)	6,265	67	.21	.44

Results—Current Study vs. Pearlman et al.

Clerical Aptitude	N	k	$\bar{r}$	$\hat{\bar{\rho}}$
Current (2010)	1,997	11	.24	.49
Pearlman (1980)	11,927	142	.23	.48

Conclusion

- Meta-analytic results are stable over time

Test	Comparison with Pearlman et al. (1980)
Verbal Ability	Higher than Pearlman
Reasoning Ability	
Performance Tests	
General Mental Ability	Same as Pearlman
Clerical Aptitude	
Perceptual Speed	
Quantitative Ability	Lower than Pearlman

Results—Paper and Pencil vs. Computer

General Mental Ability	N	k	$\bar{r}$	$\hat{\bar{\rho}}$
Paper & pencil	1,072	7	.25	.50
Computer	188	2	.37	.68

Results—Paper and Pencil vs. Computer

Verbal Ability	N	k	$\bar{r}$	$\hat{\bar{\rho}}$
Paper & pencil	9,440	22	.25	.50
Computer	349	4	.35	.65

Results—Paper and Pencil vs. Computer

Quantitative Ability	N	k	$\bar{r}$	$\hat{\bar{\rho}}$
Paper & pencil	11,375	24	.21	.42
Computer	424	4	.24	.48

Results—Paper and Pencil vs. Computer

Reasoning Ability	N	k	$\bar{r}$	$\hat{\bar{\rho}}$
Paper & pencil	7,295	17	.22	.44
Computer	263	2	.21	.44

Results—Paper and Pencil vs. Computer

Perceptual Speed	N	k	$\bar{r}$	$\hat{\bar{\rho}}$
Paper & pencil	9,653	30	.25	.50
Computer	767	5	.23	.46

Conclusion

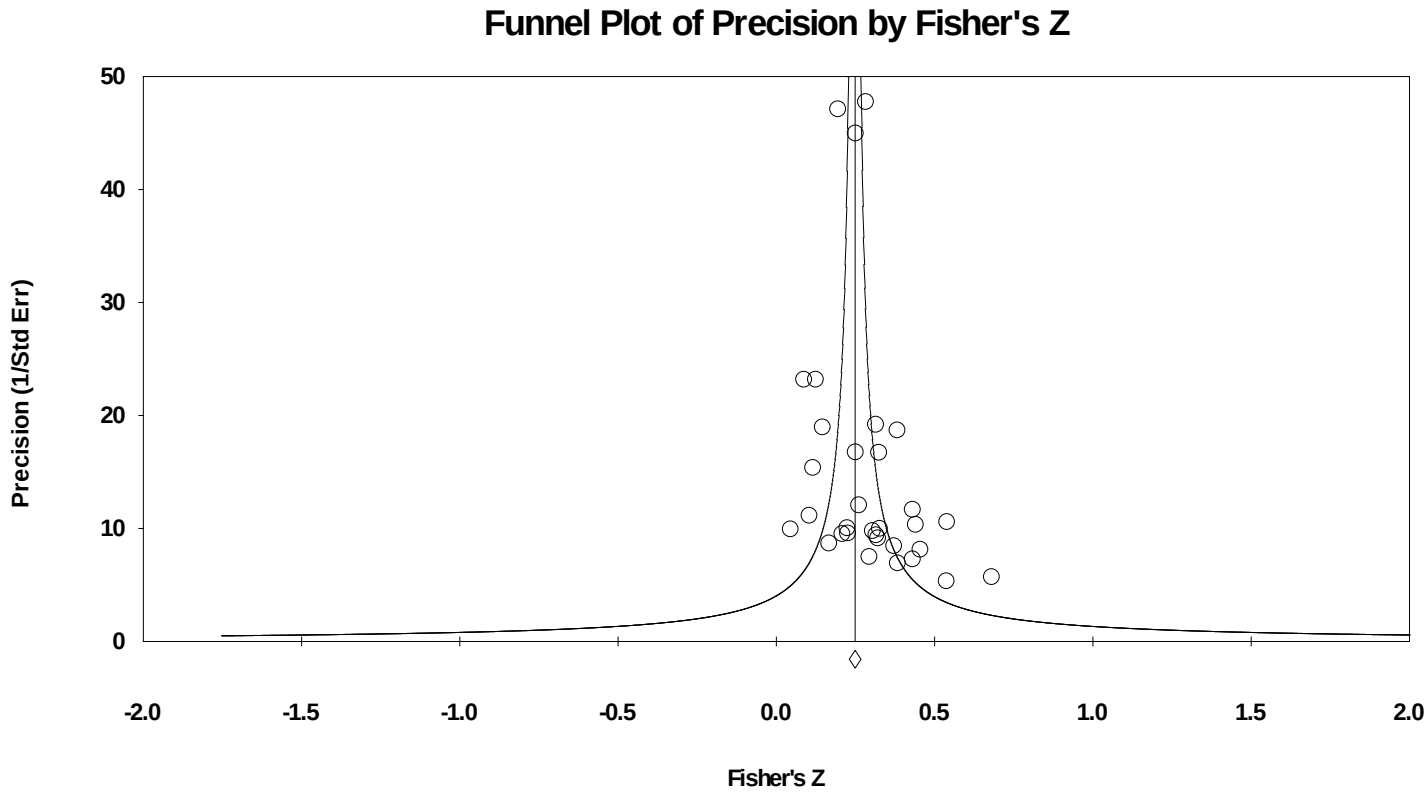
- Which is higher?

Test	**Comparison between paper and pencil vs computer**	**Number of studies**
General Mental Ability	Computer	2
Verbal Ability	Computer	4
Quantitative Ability	Computer	4
Reasoning Ability	Same	2
Perceptual Speed	Paper and Pencil	5

Results and Conclusion—Personality (Big 5)

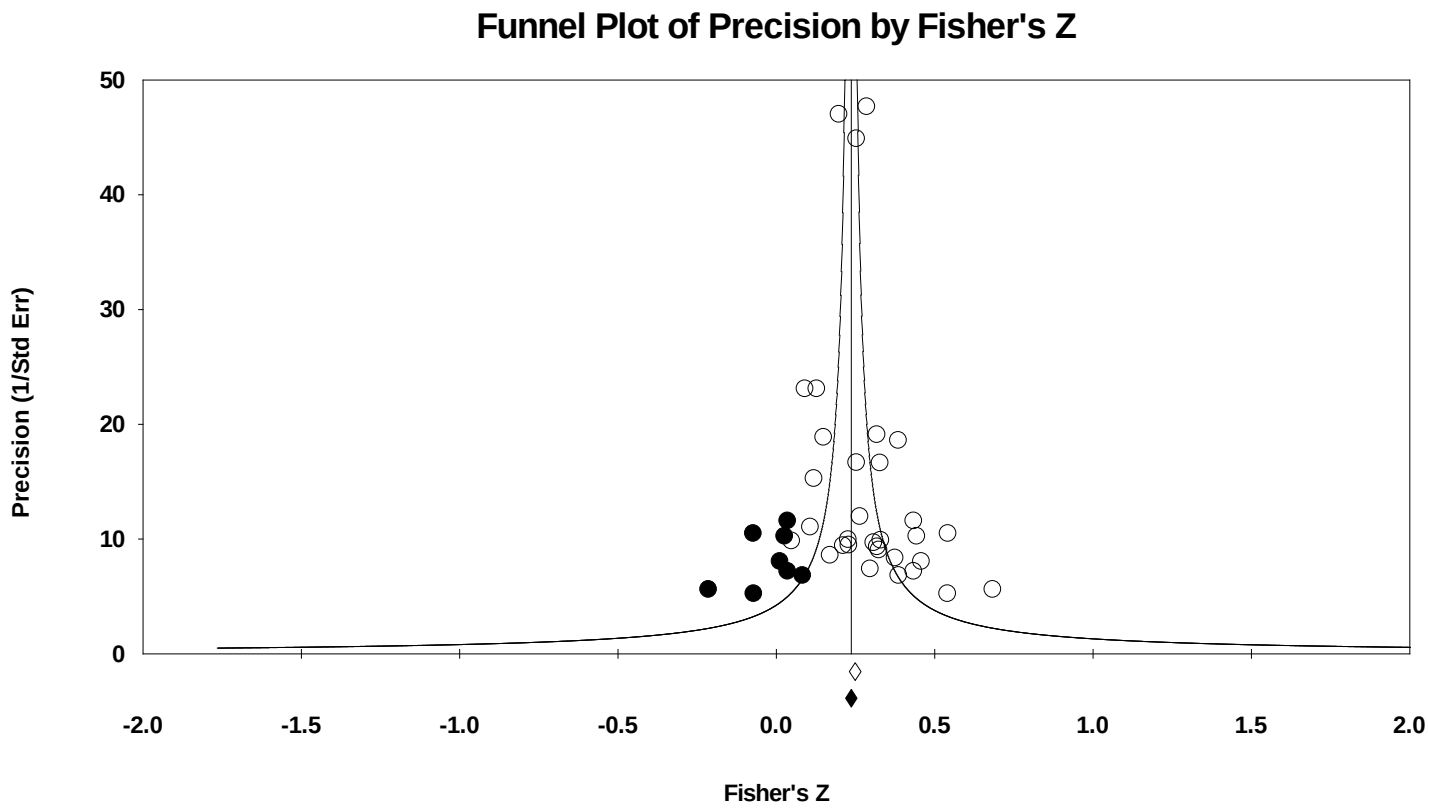
Big 5 Personality	N	k	$\bar{r}$	$\hat{\bar{\rho}}$
Extraversion	3,637	9	-.04	-.09
Agreeableness	2,583	12	.12	.25
Conscientiousness	5,411	15	.19	.39
Emotional Stability	5,264	15	.12	.25
Openness to Experience	2,318	8	.11	.24

Results and Conclusion—Publication Bias



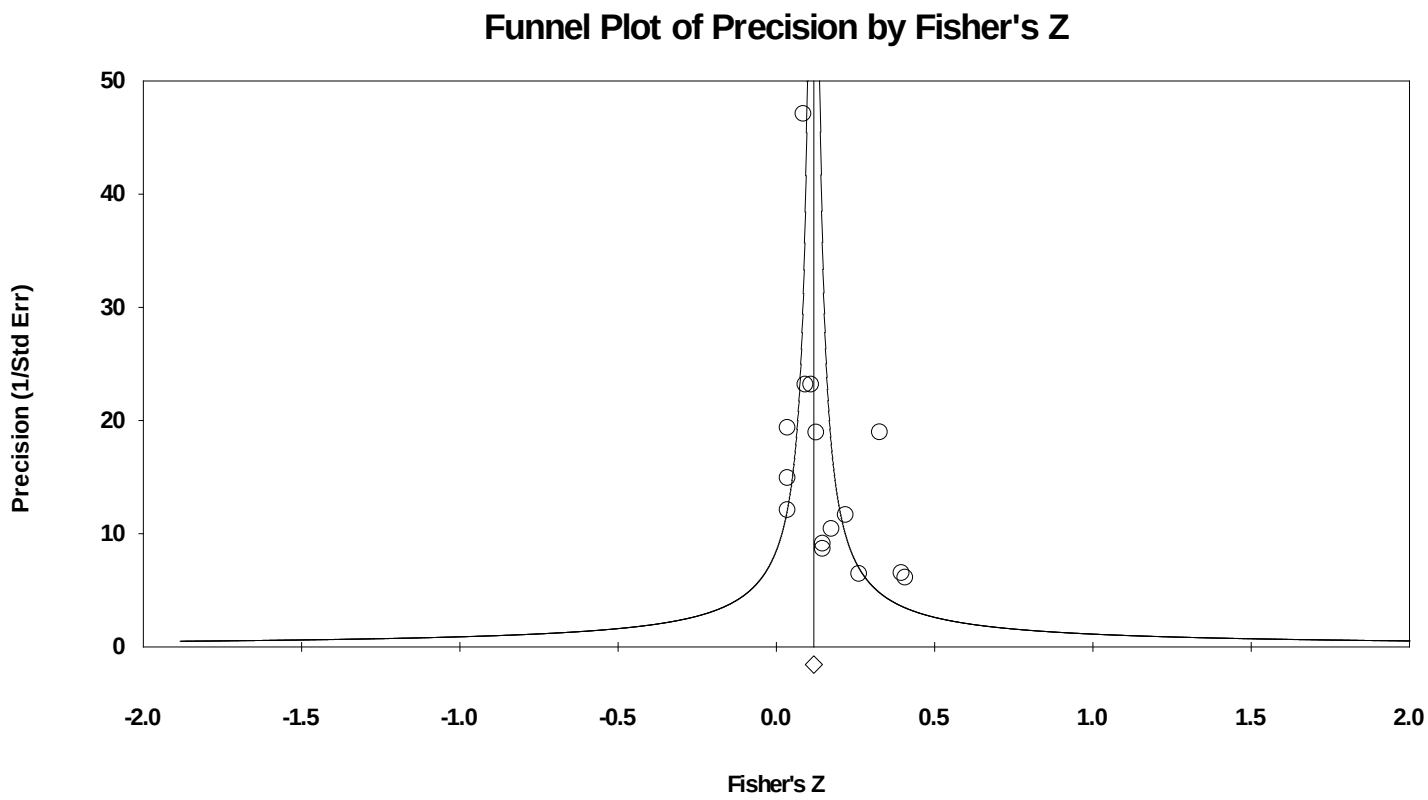
Results for Verbal Ability

Results and Conclusion—Publication Bias



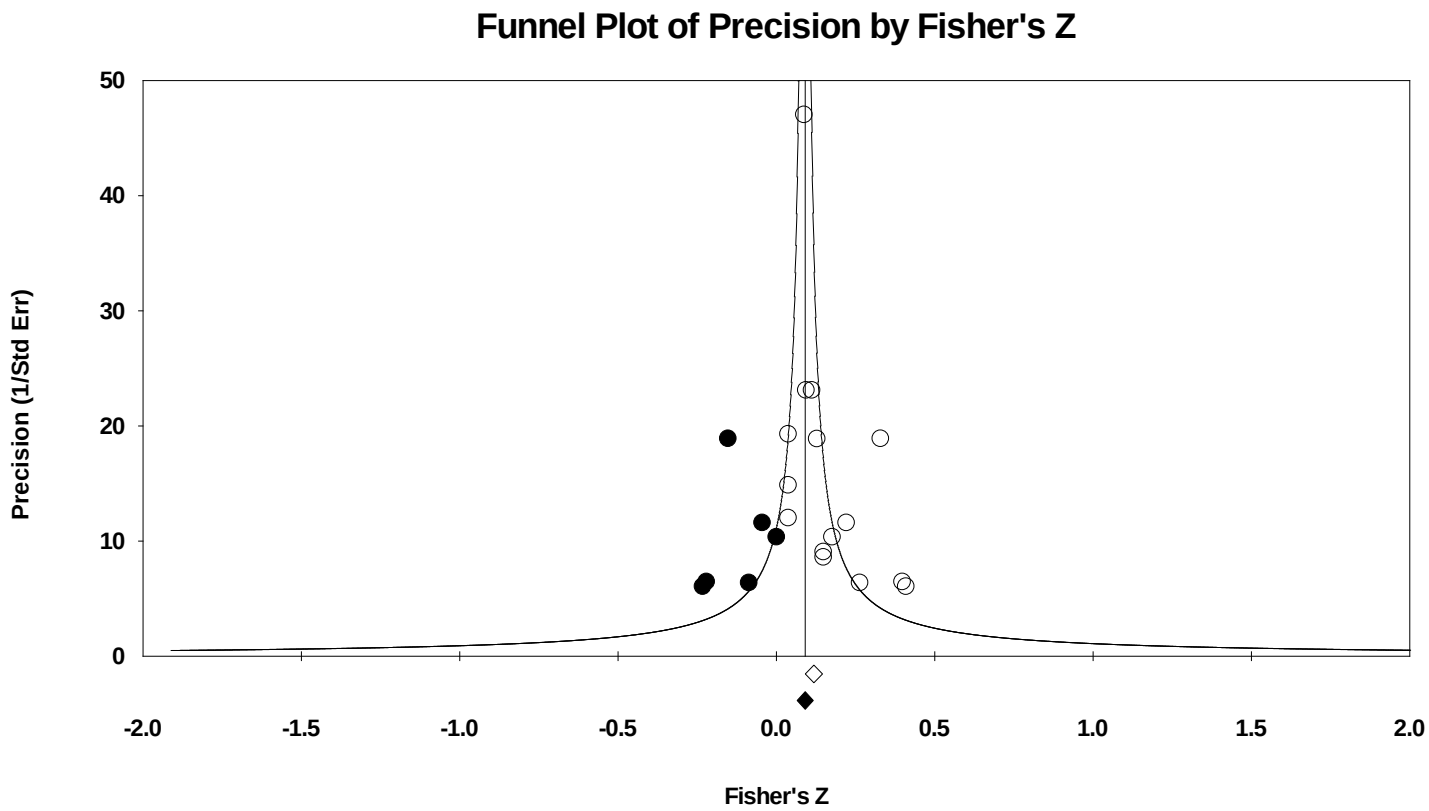
Results for Verbal Ability; 8 studies imputed; validity changes .033

Results and Conclusion—Publication Bias



Results for Emotional Stability

Results and Conclusion—Publication Bias



Results for Emotional Stability; 6 studies imputed; validity changes .050

Summary

- Validities are stable over time.
- Three validity estimates (Verbal, Reasoning and Performance) obtained in the current study (2010) are higher than those obtained by Pearlman (1980).
- For three of the predictor groups (GMA, Verbal, Quantitative), computer-administered tests appear to be more valid than paper and pencil tests.
  - Interpret with caution due to low number of studies
- Personality predictor results are similar to other studies of personality.
  - Difficult to estimate given concurrent studies
- There is little or no evidence of publication bias.
  - Not enough to change conclusions about tests

Thank you!