

Examining the Relationship Between Assessment Center Final Dimension Ratings and External Measures of Cognitive Ability and Personality

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“Setting the Stage”

- For two decades researchers have challenged the construct validity of assessment centers (ACs)
(Sackett & Dreher, 1982; Howard, 1997)
- These researchers have primarily focused on internal validation strategies
 - Findings from these studies indicate that assessor ratings exhibit convergent validity, but they lack discriminant validity *(Lievens & Kilmoski, 2001)*
 - Research has also focused on factor analytic examinations with similar disappointing findings
(Bycio, Alvarez & Hahan, 1987; Schneider & Schmidt, 1992)

“Setting the Stage”

- Taken together, past research using internal validation strategies questions assessors' ability to distinguish among different skills dimensions (*Thornton, 1992*)
- This is especially problematic in developmental settings (*Bycio et al., 1987; Kudisch, Ladd, & Dobbins, 1997*)

AC Literature: Current State of Affairs

- More recently, researchers have begun using external validation strategies
 - Some of these studies have produced promising results by linking measures of personality and cognitive ability with conceptually similar AC dimensions and exercises (*Shore, Thornton, & Shore, 1992; Spector, Schneider, Vance, & Hezlett, 2000; Thornton, Tziner, Dahan, Clevenger, & Meir, 1997*)
 - Others have failed to produce such relationships (*Chan, 1996; Crawley, Pinder, & Herriot, 1990; Fleenor, 1996; Goffin, Rothstein, & Johnson, 1996*)

Limitations of Past Research

- Few studies have addressed this area
- Lack of significant linkages between personality attributes and assessor ratings may be due to the use of external measures possessing questionable psychometric properties (*e.g., FIRO-B; Crawley, Pinder & Herriot, 1990*)
- Lack of strong a priori conceptual linkages between personality traits and AC ratings; archival data (*Chan, 1996; Crawley et al., 1990*)
- Matching AC dimensions to personality traits that reflect little to none of the behaviors associated with the respective AC dimension (*e.g., integrity & intellectual orientation; Fleenor, 1996*)

The Present Study

- Current study extends past research by investigating the relationship between eight overall dimension ratings and cognitive ability and personality correlates
- We proposed that:
 - 1) final dimension ratings would correlate more strongly with conceptually related than conceptually unrelated measures
 - 2) three conceptually meaningful factors would underlie the data (Cognitive, Expression, and Leadership Clusters)

Research Hypotheses

- H1:** Cognitive ability measure will relate more strongly to the final dimension ratings from the cognitive cluster than to final dimension ratings from the expression and leadership clusters.
- H2:** Final dimension ratings from the leadership cluster will relate more strongly to conceptually similar personality scales than to conceptually dissimilar scales.

Research Hypotheses

- H3:** Final dimension ratings from the expression cluster will relate more strongly to conceptually similar personality scales than to conceptually dissimilar personality scales.
- H4:** Final dimension ratings from the cognitive cluster will relate more strongly to conceptually similar personality scales than to conceptually dissimilar personality scales.

Research Hypotheses

- H5:**
- a:** Cognitive dimensions will be more highly intercorrelated with each other than with expression or leadership dimensions.
 - b:** Expression dimensions will be more highly intercorrelated with each other than with cognitive or leadership dimensions.
 - c:** Leadership dimensions will be more highly intercorrelated with each other than with cognitive dimensions or expression dimensions.

Method

- Archival data
- 71 Participants
 - 60 from a national retail/home improvement chain and 11 from a utility service
- Completed an AC used for *both* administrative and developmental purposes
- Demographics: 91.5% white, 62% male
 - M* age = 38.6 years (*SD* = 7.0)
 - Education level: HS (18.8%), AA (6.3%), Bachelors (50%), Masters (25%)

Method

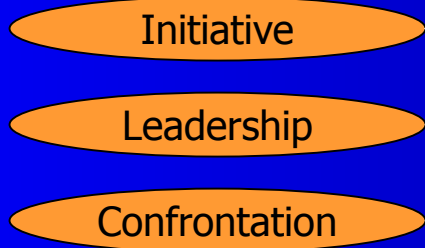
- **Assessment Center Process**
 - **Assessors:** I/O psychologists & doctoral students
 - Extensive training
 - Whenever possible, 2:1 ratio of assessors to assessees
 - **AC exercises:** interview simulation with subordinates, LGD, in-basket
 - **Standardized tests:** California Psychological Inventory (CPI) & Watson-Glaser Critical Thinking Appraisal (CTA)
 - Results generated after final dimension ratings derived
 - **AC dimensions:** initiative, leadership, confrontation, sensitivity, oral comms, judgment, analysis, decisiveness
 - Final dimension ratings derived via consensus on within-exercise ratings; 5-point rating scale (1=low; 5=high)

Method (*cont.*)

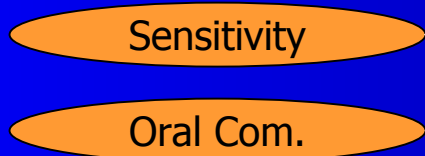
- Hypothesized Nomological Linkages Between AC Dimensions & External Measures
 - Similar to process used by Shore et al. (1990)
 - Based on consensus ratings by two psychologists who had considerable experience with testing & assessment, psychometrics, and performance appraisal
 - Stringent criterion: Used only those linkages predicted by both SMEs (either independently or via consensus)

Conceptual Linkages

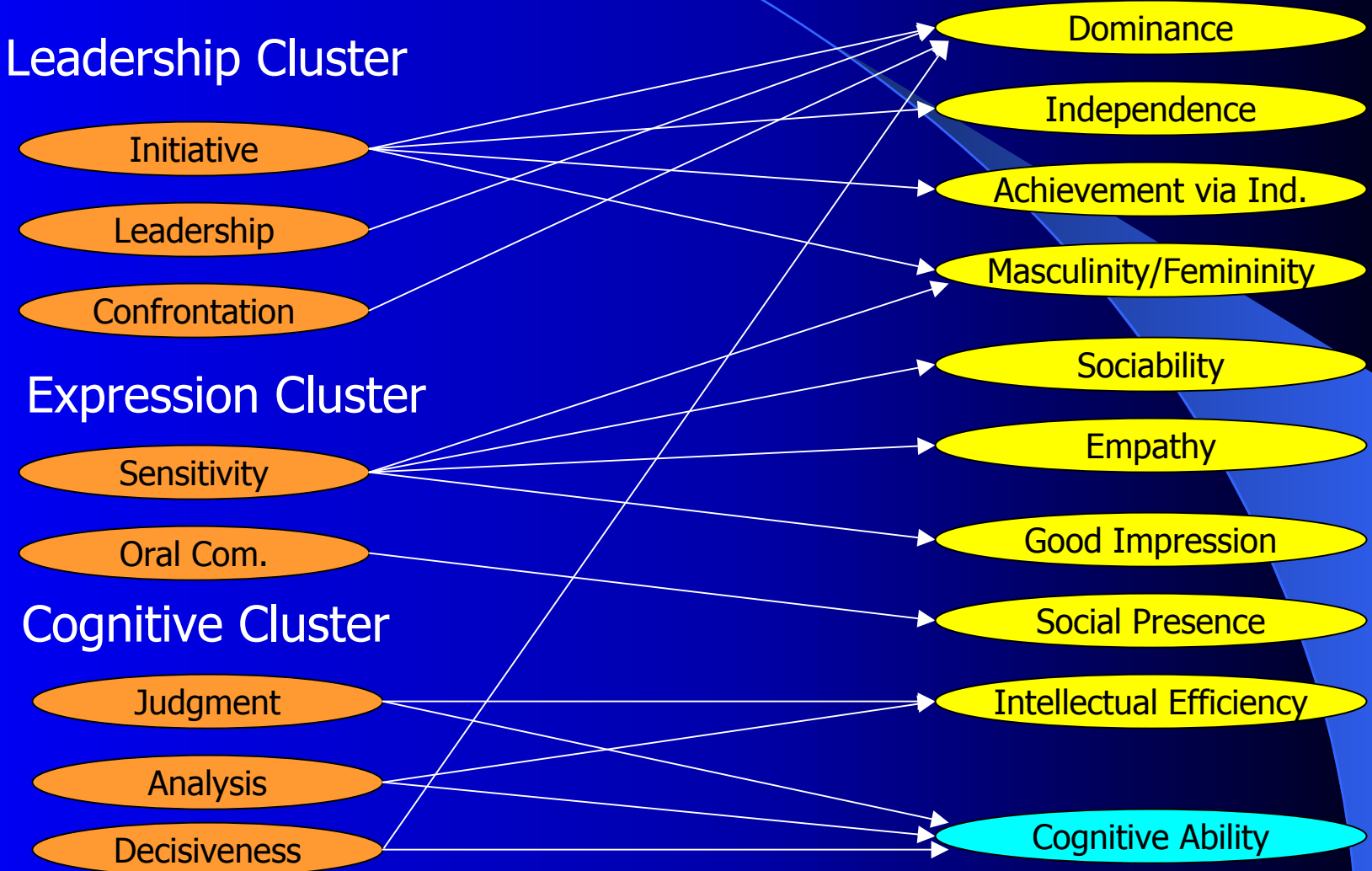
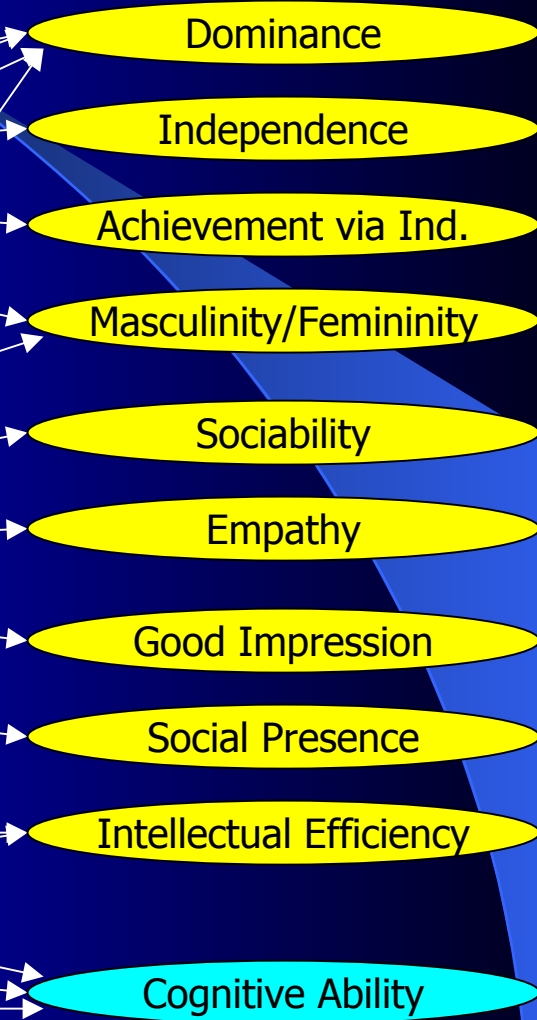
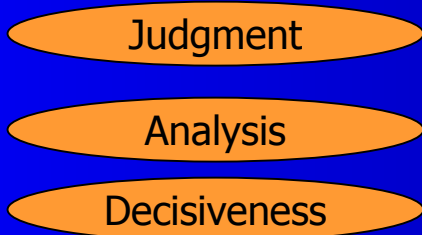
Leadership Cluster



Expression Cluster



Cognitive Cluster



Method (*cont.*)

- **CPI scales** (*Gough, 1987*)
 - Dominance ($\alpha = .79$)
 - Independence ($\alpha = .70$)
 - Achievement via Independence ($\alpha = .70$)
 - Femininity/Masculinity ($\alpha = .63$)
 - Sociability ($\alpha = .71$)
 - Empathy ($\alpha = .58$)
 - Good Impression ($\alpha = .77$)
 - Social Presence ($\alpha = .69$)
 - Intellectual Efficiency ($\alpha = .72$)
- **Cognitive Ability** (*Watson & Glaser, 1980*)
 - parallel form reliability ($r = .75$)

Results

- Preliminary Statistical Analyses

- Exploratory factor analysis with oblimin rotation supported the presence of three factors that accounted for 66.22% of the variance
 - Factor 1 (Leadership): 35.06%
 - Factor 2 (Expression): 17.14%
 - Factor 3 (Cognitive): 14.03%
- These three broad categories are also consistent with other typologies (c.f., Thornton et al., 1997; Davis et al., 1992)

Results: Main Analyses

- Two of three proposed AC dimensions significantly correlated with scores on the CTA (judgment $r = .43$; analysis $r = .58, p < .05$)
- Average r between the cognitive cluster dimensions and the CTA (.39) was significantly greater than: (1) the average correlation between the CTA and leadership cluster dimensions ($M r = .10; t = 2.04, p < .05$), and (2) the average correlation between the CTA and expression cluster dimensions ($M r = .07; t = 2.14, p < .05$).

☑ Hypothesis 1 was supported

Results (*cont.*)

- Of the six predicted relationships between leadership cluster dimensions and personality scales, only one was significant ($r_{\text{initiative, dominance}} = .25, p < .05$)
- Two hypothesized linkages approached significance
 - $r_{\text{initiative, achievement via independence}} = .22, p < .06$
 - $r_{\text{leadership, dominance}} = .22, p < .07$
- Average r between similar CPI scales and leadership cluster dimensions was not significantly different from the average r between dissimilar CPI scales and the leadership cluster dimensions

Limited support for Hypothesis 2



Results (*cont.*)

- No significant relationships between expression dimensions and conceptually similar personality scales
- Average r between similar CPI scales and expression cluster dimensions was not significantly different from the average correlation between dissimilar CPI scales and the expression cluster dimensions.

No evidence to support Hypothesis 3



Results (*cont.*)

- No significant relationships between cognitive cluster dimensions and conceptually similar personality scales
- Average r between similar CPI scales and cognitive cluster dimensions was not significantly different from the average correlation between dissimilar CPI scales and the cognitive cluster dimensions

No evidence to support Hypothesis 4



Results (*cont.*)

- Intercorrelations within the leadership cluster ($M r = .51$) were significantly greater than the correlations between the leadership cluster and conceptually unrelated dimensions ($M r = .21, z = 2.04, p < .05$)
- Intercorrelations within the expression cluster ($M r = .25$) were greater than the correlations between the expression cluster and unrelated dimensions ($M r = .18$), but the difference was not statistically significant
- Intercorrelations within the cognitive cluster ($M r = .39$) were greater than correlations between the cognitive cluster and unrelated dimensions ($M r = .21$), but the difference was not statistically significant

Partial support for Hypothesis 5

Discussion

- Current study responds to calls for more construct research using external validation strategies (*Spector et al., 2000*)
- Results provide some evidence that assessors can distinguish between two broad clusters of skill dimensions – cognitive & leadership; somewhat consistent with past research (*c.f., Shore et al., 1990; Thornton et al., 1997*)
 - Extends findings to final dimension ratings derived using the within-exercise rating method
- Factor analytic findings provided support for the three a priori skill dimension clusters
- Similar to Shore et al. (1990), intercorrelations within all three clusters provided some additional construct validity evidence

Discussion (*cont.*)

- Convergent & discriminant validity evidence found for cognitive cluster dimensions
 - Avg correlation between the CTA and dimensions within the cognitive cluster greater than avg correlation of CTA and dissimilar dimensions
 - Moderate intercorrelations among dimensions within the cognitive cluster ($M r = .33$)
 - Caveat: Lack of relationship between cognitive cluster dimensions and conceptually similar personality scales not surprising since CPI measures interpersonal **style** vs. cognitive **ability**

Discussion (*cont.*)

- Some convergent & discriminant validity evidence found for leadership cluster dimensions
 - Relatively high correlations among the leadership dimensions ($M r = .51$); sig. greater than correlations between leadership cluster and unrelated dimensions
 - Although convergent validity for only 1 of 6 linkages with similar CPI measure, inadequate power may have precluded 2 others linkages from reaching significance
 - Dimensions not significantly related to CTA ($M r = .10$)

Discussion (*cont.*)

- Little construct validity evidence found for expression cluster dimensions
 - Sensitivity and oral communication were not significantly related to any of the five conceptually similar personality dimensions
 - Moderate intercorrelations among dimensions within the cognitive cluster ($M r = .25$)
 - Dimensions not significantly related to CTA ($M r = .07$)

Other Implications

- Theoretical implications
 - Contrary to some beliefs (c.f., Klimoski & Brickner, 1987), our findings lend additional support to the notion that ACs measure meaningful attributes beyond “g” (Shore et al., 1990; Thornton et al., 1997)
- Practical implications
 - Viability of developmental feedback based on broad clusters of behavior

Study Limitations

- Statistical artifacts
 - Sample size/power; range restriction of AC dimension ratings
- Difficulty establishing strong conceptual linkages between personality scales and AC dimensions
 - Personality scales do not measure entire domain of behaviors associated with AC dimensions (e.g., Oral Communication)
- “Nature of personality tests” = preferences vs. abilities
- Low/moderate reliability of some personality scales
- Response bias associated with personality measures
 - However, CPI less transparent; no invalidity flags emerged

Future Research

- Replication using a larger, representative sample
- Construct validity of other skill dimensions
- Extension of nomological network via examining other external measures of conceptually related dimensions (e.g., 360-degree feedback)
- Incremental validity of various AC clusters
- Reactions to feedback based on clusters vs. dimensions

Questions & Comments

References

- Bycio, P., Alvarez, K. M., & Hahn, J. (1987). Situational specificity in assessment center findings: A confirmatory factor analysis. *Journal of Applied Psychology, 72*, 463-474.
- Chan, D. (1996). Criterion and construct validation of an assessment center. *Journal of Occupational and Organizational Psychology, 69*, 167-181.
- Crawley, B., Pinder, R., & Herriot, P. (1990). Assessment center dimensions, personality, and aptitudes. *Journal of Occupational Psychology, 63*, 211-216.
- Davis, B. L., Skube, C. J., Hellervik, L. W., Gebelein, S. H., & Sheard, J. L. (1992). *Successful managers handbook*. Minneapolis: Personnel Decisions, Inc.
- Fleenor, J. W. (1996). Constructs and developmental assessment centers: Further troubling empirical findings. *Journal of Business and Psychology, 10*, 319-333.
- Goffin, R. D., Rothstein, M. G., & Johnson, N. G. (1996). Personality testing and the assessment center: Incremental validity for managerial selection. *Journal of Applied Psychology, 81*, 746-756.
- Gough, H. G. (1987). *California Psychological Inventory Administrator's Guide*. Palo Alto, CA: Consulting Psychologists Press.
- Howard, A. (1997). A Reassessment of assessment centers: Challenges for the 21st century. In R.E. Riggio & B.T. Mayes (Eds.), *Assessment centers: Research and applications*. [Special issue]. *Journal of Social Behavior and Personality, 12*, 13-52.
- Kudisch, J. D., Ladd, R. T., & Dobbins, G. H. (1997). New evidence on the construct validity of diagnostic assessment centers: The findings may not be so troubling after all. In R.E. Riggio & B.T. Mayes (Eds.), *Assessment centers: Research and applications*. [Special issue]. *Journal of Social Behavior and Personality, 12*, 129-144.

References

- Kudisch, J. D., Lundquist, C., & Smith, A. F. R. (2001, September). *Reactions to "dual-purpose" assessment center feedback: What does it take to get participants to buy into and actually do something with their feedback?* Paper presented at the 29th annual meeting of the International Congress on Assessment Center Methods, Frankfurt, Germany.
- Lievens, F., & Kilmoski, R. J. (2001). Understanding the assessment center process: Where are we now? In C. L. Cooper & I. T. Robertson (Eds.), *International Review of Industrial and Organizational Psychology* (pp. 246-286). Chichester, NY: John Wiley & Sons, Ltd.
- Sackett P., & Dreher G. (1982). Constructs and assessment center dimensions: Some troubling empirical findings. *Journal of Applied Psychology, 67*, 401-410.
- Schneider, J. R., & Schmitt, N. (1992). An exercise design approach to understanding assessment center dimension and exercise constructs. *Journal of Applied Psychology, 77*, 32-41.
- Shore, T. H., Thornton, G. C., & Shore, L. M. (1990). Construct validity of two categories of assessment center dimension ratings. *Personnel Psychology, 43*, 101-117.
- Spector, P. E., Schneider, J. R., Vance, C. A., & Hezlett, S. A. (2000). The relation of cognitive ability and personality traits to assessment center performance. *Journal of Applied Social Psychology, 30*, 1474-1491.
- Thornton, G. C. (1992). *Assessment centers in human resource management*. Reading, MA: Addison-Wesley.

References

- Thornton, G. C. III, Tziner, A., Dahan, M., Clevenger, J. P., & Meir, E. (1997). Construct validity of assessment center judgments: Analyses of the behavioral reporting method. In R.E. Riggio & B.T. Mayes (Eds.), *Assessment centers: Research and applications*. [Special issue]. *Journal of Social Behavior and Personality*, *12*, 109-128.
- Watson, G., & Glaser, E. M. (1980). *Manual for the Watson-Glaser Critical Thinking Appraisal*. New York: Psychological Corporation.

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