

## Research Methods in Industrial-Organizational Psychology<sup>12</sup>

Empirical research is the foundation of scientific inquiry. Through the systematic collection of data and hypothesis testing, psychologists create and refine theories to explain and predict human cognition and behavior. Industrial-organizational (I-O) psychologists create, refine, and apply research methods to solve organizational problems and increase the understanding of employees in the workplace. For example, meta-analysis allows researchers to summarize many studies conducted on a similar topic to uncover consistent relationships between variables, and moderators, or boundary conditions, of those relationships (Hunter, Schmidt, & Jackson, 1982; Rogelberg, 2004).

A statistical technique called item response theory has helped I-O psychologists minimize test bias and also dramatically reduce the length of standardized tests while maintaining their reliability and validity (Embretson & Reise, 2000). Factor analysis helps researchers and practitioners uncover the underlying constructs that are measured by tools such as employee surveys (Brown, 2006). Further, structural equation modeling is used to estimate relationships between constructs, while taking into account measurement error (MacCallum & Austin, 2000). Techniques such as generalizability theory and hierarchical linear modeling enable examinations of the influence of variables at different levels of analysis (Rogelberg, 2004). For example, we might be interested in group-level variables such as team size and the effects of a leader, while also testing hypotheses about individual-level variables such as personality, ability, and motivation.

Despite all of the sophisticated statistical techniques available today, none can substitute for sound design of research studies. For example, longitudinal designs where variables are measured at multiple points in time allow the researcher to establish temporal sequence, where cause precedes effect. Also, wherever feasible, the random assignment of participants to control and experimental groups allows the researcher to rule out alternative explanations for findings.

One of the primary pursuits of I-O psychologists is to identify individual differences that predict job performance. Methods based on correlation and regression are typically used to shed light on these relationships. For example, hierarchical multiple regression has been used to show that conscientiousness explains incremental variability in job performance in addition to cognitive ability (Schmidt & Hunter, 1998). Thus, hiring tools that include measures of both cognitive ability and conscientiousness should help organizations make better hiring decisions than the use of either measure alone.

It might surprise the reader to learn that these techniques are not just used to conduct academic research. In the age of “Big Data” and “Human Capital Analytics”, I-O psychologists are increasingly being called upon by senior leaders in organizations to solve real business challenges with research, data analysis, and

---

<sup>1</sup> [This work is licensed under a Creative Commons Attribution 4.0 International License](#). As noted in the license agreement, licensees may use this material in whole or in part, and also adapt the material as long as the licensees give appropriate credit, provide a link to the license, and indicate if changes were made.

**Author Contact:** [textbook@siop.org](mailto:textbook@siop.org)

<sup>2</sup> Please cite as: Research Methods in Industrial-Organizational Psychology. (2018, August 28). Retrieved from <https://www.siop.org/Events-Education/Educators/Incorporating-I-O>

most importantly, a rigorous approach to measuring and understanding psychological constructs with an emphasis on reliability and validity.

## References

- Brown, T. A. (2006). *Confirmatory Factor Analysis for Applied Research*. New York, NY: The Guilford Press.
- Embretson, S. E., & Reise, S. P. (2000). *Item Response Theory for Psychologists*. Mahwah, NJ: Erlbaum Publishers.
- Hunter, J. E., Schmidt, F. L., & Jackson, G. B. (1982). *Meta-Analysis: Cumulating Research Findings Across Studies*. Beverly Hills, CA: Sage Publications.
- MacCallum, R. C. & Austin, J. T. (2000). Applications of structural equation modeling in psychological research. *Annual Review of Psychology*, *51*, 201-226. doi: 10.1146/annurev.psych.51.1.201
- Rogelberg, S. G. (2004). *Handbook of Research Methods in Industrial and Organizational Psychology*. Malden, MA: Blackwell Publishing Ltd.
- Schmidt, F. L., & Hunter, J. E. (1998). The validity and utility of selection methods in personnel psychology: Practical and theoretical implications of 85 years of research findings. *Psychological Bulletin*, *124*(2), 262-274. doi: 10.1037/0033-2909.124.2.262.