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Guest editorial: The quest for scientific discipline in HRD research: designs that support causal inference

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GUEST EDITORIAL

The quest for scientific discipline in HRD research: designs that support causal inference

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Abstract

Purpose – The purpose of this editorial is to introduce the special issue, "The Quest for Scientific Discipline in HRD Research: Designs that Support Causal Inference".

Design/methodology/approach – This special issue presents seven papers that consider human resource development (HRD) research though the lens of scientific rigor, as well as techniques and considerations that researchers might use to strengthen claims of causality.

Findings – Based on the research reported in this special issue, it appears that the field of HRD is not necessarily distinct from educational research in the level of scientific rigor used in studies as reported in a group of HRD journals.

Originality/value – The seven papers provide practical advice for researchers who wish to move their research up the hierarchy of evidence and conduct rigorous research that answers "what works" questions.

Keywords Validity, Causality, Evidence, Research design, Human resource development, Implications for practice

Paper type General review

In this special issue of the *European Journal of Training and Development*, we examine human resource development (HRD) research though the lens of scientific rigor and present techniques and considerations that might be used to strengthen claims of causality. The impetus for this special issue originated from recent work by one of us (Robinson) and his colleagues on the scientific rigor used in educational research.

Scientific rigor in educational research

Based on a few descriptive studies examining education journals (Hsieh *et al.*, 2005; Reinhart *et al.*, 2013; Robinson *et al.*, 2007; Shaw *et al.*, 2010), we offer the certain observations, as described in the section below.

Educational intervention and experimental research appear to be on the decline

Intervention research published in a group of four educational psychology journals (*Contemporary Educational Psychology*, *Cognition and Instruction*, the *Journal of Educational Psychology* and the *Journal of Experimental Education*) and the *American*

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Educational Research Journal decreased from 44 per cent of all empirical articles in 1994 to 26 per cent in 2010. Intervention research that used random assignment (experimental) decreased from 47 per cent in 1983 to 22 per cent in 2010.

Observational research accompanied by recommendations for practice appears to be replacing intervention research

Intervention research involves the research manipulating an independent variable. Comparing performances in 2008 and 2011 or comparing boys to girls is not an intervention. Observational research involves looking at comparisons or relationships without strong evidence of causality. Causality is typically required before a recommendation for practice is warranted. In 1994, only 30 per cent of non-intervention articles included such recommendations. However, by 2010, this percentage had increased to 46 per cent. Thus, if you consider this group of journals as representative of the field, almost half of the educational psychology contributions to practice were based on research methods that have weak evidence for causal claims.

Statistical modeling of observational data is on the rise and these articles are more likely to contain recommendations than are articles based on observational data that do not use modeling

This increase in the tendency of authors to make recommendations based on non-intervention research coincided with the explosion in the use of statistical modeling techniques (e.g. SEM, HLM, etc.) with correlational data. In 2000, only nine articles out of 135 used statistical modeling analyses with correlational data. Six of those articles included recommendations for practice. By 2010, 50 articles out of 141 used modeling with correlational data; 29 of those articles included recommendations for practice. It appears that authors of empirical articles in educational psychology journals are becoming more likely to base their recommendations for practice on correlational data accompanied by statistical modeling analyses. Can we blame the modeling analyses? No. Just like other tools, such as null hypothesis, significance testing, and meta-analysis, modeling is not the problem. It is the people who believe that modeling can somehow take correlational data and yield causal conclusions.

Recommendations based on observational data can be repeated in later articles

19 non-intervention articles published in 1994 included a recommendation for practice. Within the next 10 years, these 19 articles were cited in 255 later articles. The original recommendation for practice was repeated in 30 of those articles, a rate of 12 per cent. So, the actual "damage" of original recommendations for practice based on weak causal evidence does not simply end with the original publication. Other researchers may repeat the weak claim.

Aim of the special issue

Recognizing that although HRD is still an emerging field, related research has the potential to impact practice. In fact, Gubbins and Rousseau (2015) presented a general hierarchy of evidence based on research design and challenged HRD researchers to "conduct more rigorous research on important 'what works' questions" (p. 120). Building on the work of Gubbins and Rousseau (2015); Nimon and Astakhova (2015) found that most of the articles published in HRDQ from 2010-2014 reviewed were based

on cross-sectional designs with few reporting on studies that used rigorous designs at the top of the hierarchy (e.g. meta-analytic reviews, randomized control studies).

In this special issue, we respond to Robinson's (2014) challenge to *lead rather than complain* and present seven articles that consider HRD research as a scientific discipline. As such, our aims in this issue are to:

- consider where HRD research is as a scientific discipline;
- educate the HRD field in designs features that can strength causal claims; and
- consider how published reports of non-experimental research might be used to move the field forward.

Content of the special issue

In the first paper, "The Status of Intervention Research in HRD: Assessment of an Applied Discipline and Potential for Advancement", Kalis *et al.* (2016) reviewed articles published in a select set of HRD-related journals. Kalis *et al.* (2016) found that number of intervention articles declined from the 1990s to the 2000s. However, it appears that as we complete the 2010 decade, we should have more intervention research than in previous decades.

In the second paper, "Contending Claims to Causality: A Critical Review of Mediation Research in HRD", Ghosh and Jacobson (2016) also reviewed articles published in a select set of HRD-related journals and found that of the mediation studies reviewed, less than 10 per cent used an experimental research design. The authors went on to identify the limitations of such designs and offered designs strategies to strengthen claims of causality in studies that seek to test theoretically mediated relationships.

In the third paper, "Regression Discontinuity Design: A Guide for Strengthening Causal Inference in HRD", Chambers (2016) reviewed studies in a broad set of HRD-related journals and found that regression discontinuity (RD) has been used very infrequently. Chambers demonstrated the features of RD using a simulated dataset generated from published descriptive statistics. As well, she included R (R Development Core Team, 2016) syntax that researchers can use to replicate the RD analyses presented.

In the fourth paper, "Analyzing Data from a Pretest-Posttest Control Group Experimental Design: A Conceivably Perplexing Task", Zientek *et al.* (2016) reviewed articles published in a select set of HRD-related journals and found only a sparse set of articles that reported the study's underlying design as experimental and that analyzed data pre-test–post-test data from a control and treatment group. They also reviewed analytic options (i.e. *t* test, ANCOVA, linear regression, multiple linear regression) and reporting requirements associated with a pre-test–post-test control group design, including considerations of statistical assumptions. As well, they included R syntax that researchers can use the replicate the analyses presented.

In the fifth paper, "Propensity Score Analysis: An Alternative Statistical Approach for HRD Researchers", Keiffer and Lane (2016) presented propensity score analyses and illustrated the technique using an example relevant to HRD. They also contributed R syntax that readers can use to replicate the propensity score analyses.

In the sixth paper, "Nonexperimental Research: Strengths, Weaknesses and Issues of Precision", Reio (2016) presented the advantages and disadvantages of non-experimental research. Reio also clarified issues regarding accurate reporting and

generalization of results based on nonexperimental research. Finally, Reio took the position that the results of nonexperimental research can be used to make recommendations for practice when cautiously used.

In the seventh paper, "Opening the Black Box and Searching for Smoking Guns: Process Causality in Qualitative Research", McWhorther and Bennett (2016) examined causality from the lens of qualitative research and presented a model of process quality. Using their model as a base, they also reviewed studies in two HRD-related journals and found that of the quality techniques they considered relevant to causation, triangulation was reported most. As well, they reported on the results of semi-structured interviews from two thought leaders in the HRD field.

Conclusion

Based on the research reported in this special issue, it appears that the field of HRD is not necessarily distinct from educational research in the level of scientific rigor used in studies reported in a group of HRD journals. Although Kalis *et al.* (2016) did not find evidence of a decline in the frequency of intervention research published, the number of intervention research articles published overall seems low. The finding of Kalis *et al.* (2016) are congruent with the findings of Zientek *et al.* (2016) who found a sparse set of articles where the authors reported using an experimental design. As well, Ghosh and Jacobson (2016) found few mediation studies that used design features supporting causality.

We encourage authors to move up the general hierarchy of evidence as outlined in Gubbins and Rousseau (2015). While we recognize that the gold standard of an experimental design with random assignment is not always possible, prospective researchers may want to consider quasi-experimental designs such as propensity score analyses and RD.

We hope that this special issue sparks constructive conversation in the field of HRD. An important question for our field is the appropriateness of recommendations for practice based on studies that can make no valid claim of causality. As reviewers and editors, we need to carefully consider if we are pushing authors to go beyond their data when requesting the inclusion of recommendations for practice when reporting on non-experimental studies.

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