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CARMA: Research Design and Causal Inference

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Strong survey design requires strong study design

"It seems to us that, as a field, our focus regarding methodological rigor shifted from design and measurement, which was and is hard, to analysis, which has become much easier. But whereas the data from a rigorous design can be analyzed any number of ways, including simple ones, there is no analysis that can fix data from a bad design." (Cortina, Aguinis, DeShon, 2017, p. 283)

Kluemper, D. H. (2021). *Survey Design*. In Oxford Encyclopedia of Business and Management. Oxford University Press. doi: 10.1093/acrefore/9780190224851.013.233

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Internal/External/Ecological Validity

╱ Internal validity - The extent to which a piece of evidence supports a claim about cause and effect

╱ External validity - The validity of applying the conclusions of a scientific study outside the context of that study

╱ Ecological validity - The extent to which the materials and setting of the study approximate the real-world that is being examined

　　╱ (Brewer, 2000; Aguinis & Edwards, 2014).

Strong vs. Weak Causal Designs

╱ Experimental designs - Random assignment, a control group, and the manipulation of variables yield high levels of confidence regarding causal inference and internal validity but are generally weaker regarding external and ecological validity

╱ Field survey designs - Greater external and ecological validity, but less internal validity

   ╱ Discuss how to strengthen causal inferences with this design.

Causal inferences

⁄ Organizational theories are inherently causal

⁄ Aguinis & Vandenberg, 2014

⁄ Classic conditions that need to be met (Shadish, Cook, & Campbell, 2002; Kenny, 1979):

1. The independent variable must be reliably correlated with the dependent variable beyond chance

2. The independent variable must precede the dependent variable temporally

3. The relation between the independent and dependent variables must not be driven by other causes

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Causal inferences

⁄ Condition 1:

    ⁄ The independent variable must be reliably correlated with the dependent variable beyond chance

⁄ Issues:

    ⁄ May be due to CMV

    ⁄ Caveat for moderation

    ⁄ Caveat for mediation

Causal inferences

/ Condition 2:

  / The independent variable must precede the dependent variable temporally

/ Issues:

  / The timing and frequency of measurement are critical and often misapplied

  / Merely measuring the hypothesized independent variable before the dependent variable may obfuscate the true temporal relationship between the two variables.

  / **Example: Neuroticism at T1 and stress at T2**

  / Repeated measures designs are stronger, but not as strong as experiments

  / Review Mitchel & James, 2001 for a more detailed explanation

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Causal inferences

⁄ Condition 3:

    ⁄ The relation between the independent and dependent variables must not be driven by other causes

⁄ Issues: *"endogeneity – which includes omitted variables, omitted selection, simultaneity, common-method variance, and measurement error – renders estimates causally uninterpretable"*

    ⁄ Example: Ice cream sales and drowning deaths

    ⁄ Review Antonakis, Bendahan, Jacquart, & Lalive, 2010 for a more detailed explanation

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