Class 6 - Elements III: Constructs and variables

Agenda

- Key thinking tool: DAGs x formal theory (15 minutes)
- Conceptual grounding (5 minutes)
- Core paper discussion (45 minutes)
- *Break*
- Compare-contrast presentation (Group 13-16; 40 minutes)
- Key thinking tool: Validity assessments (15 minutes)

DAGs and formal theory

Key Thinking Tool: DAGs

Directed *acyclic* **graph**

has nodes (constructs) and edges (relationships)

there are no loops

the relationships have a direction of influence (correlations are bidirectional)

Key Thinking Tool: DAGs

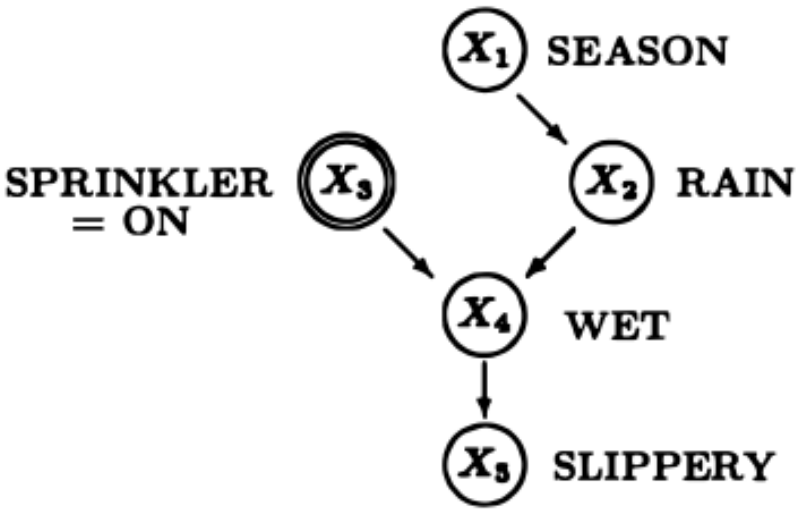


Figure 1.4 Network representation of the action "turning the sprinkler On."

Figure 1: A Bayesian DAG model courtesy of (Pearl 2001)

Why DAGs?

They provide a visual tool to determine if the claims we make can possibly be causal (Pearl 2010)

They provide a scaffold upon which future researchers can more easily build

And at a minimum, they force us to **write out our model explicitly** in terms of constructs and relationships

Key Thinking Tool: Formal theory

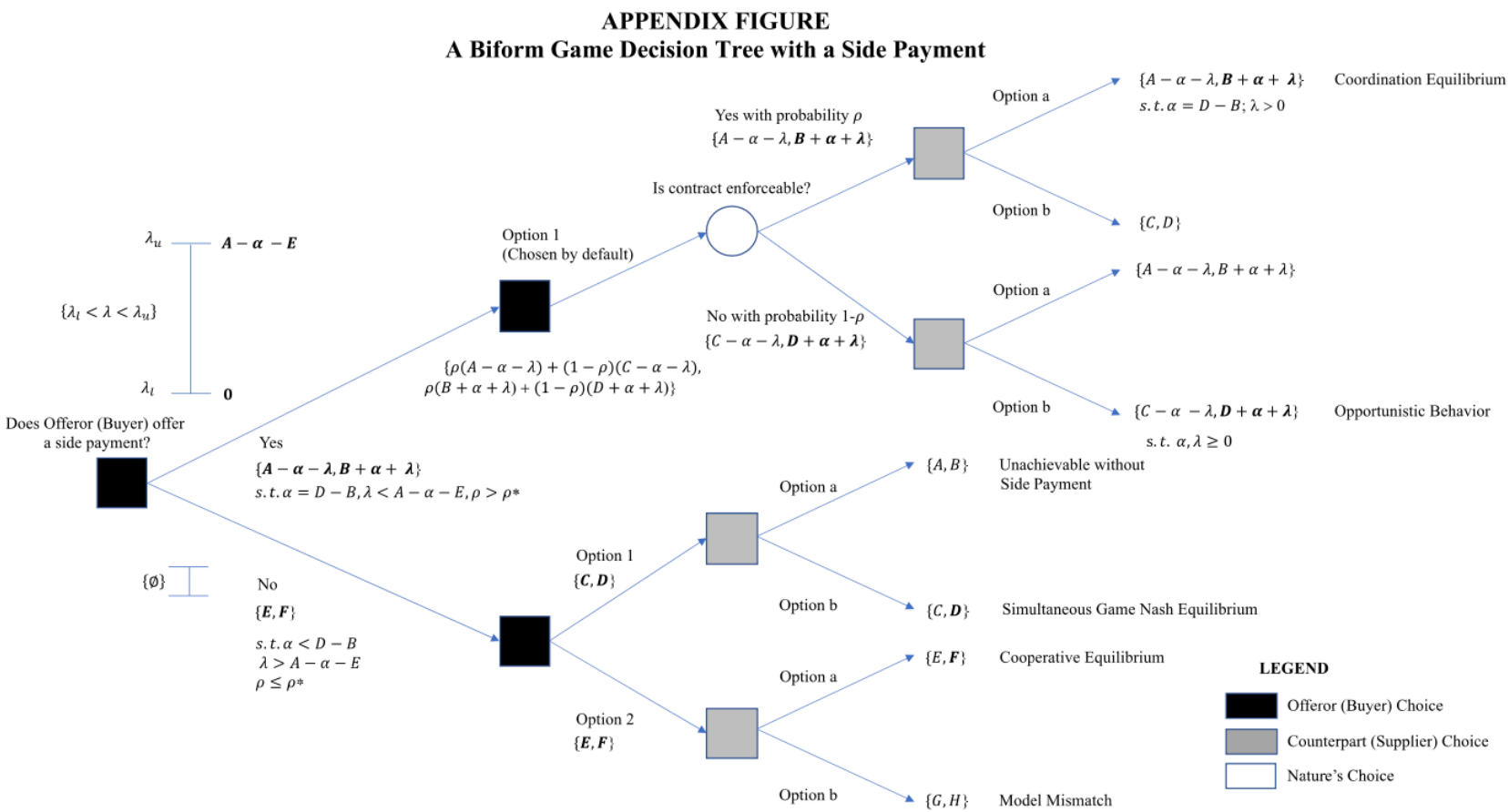


Figure 2: An example analytic model from (Fox, Grove, and Souder 2021)

Why formal theory?

1. precision and transparency
2. logical consistency, and
3. an ability to identify unanticipated implications (Adner et al. 2009, 202)

Integrating DAGs with formal theory

- DAGs can make clear how a model fits within a larger set of nomological networks, be they theoretical or phenemenonological
- Formal theorizing provides the tools to consider more complex relationships and nth-order effects than verbal theorizing readily affords, which tends to capture first-order, linear[1] chains of logic

[1]Note that linearity is not as technically constraining as it may seem. Linearity means that a tested function must be linear with respect to its **parameters**, not its **arguments**. Thus, $y = \beta x^2$ is permissable but $y = \beta^2 x$ is not. The issue is not so much a technical issue but straight-line thinking

Grounding

Making things real

- Constructs: Bounding ideas to give them form
- Variables: (Imperfectly) reifying constructs to make them observable

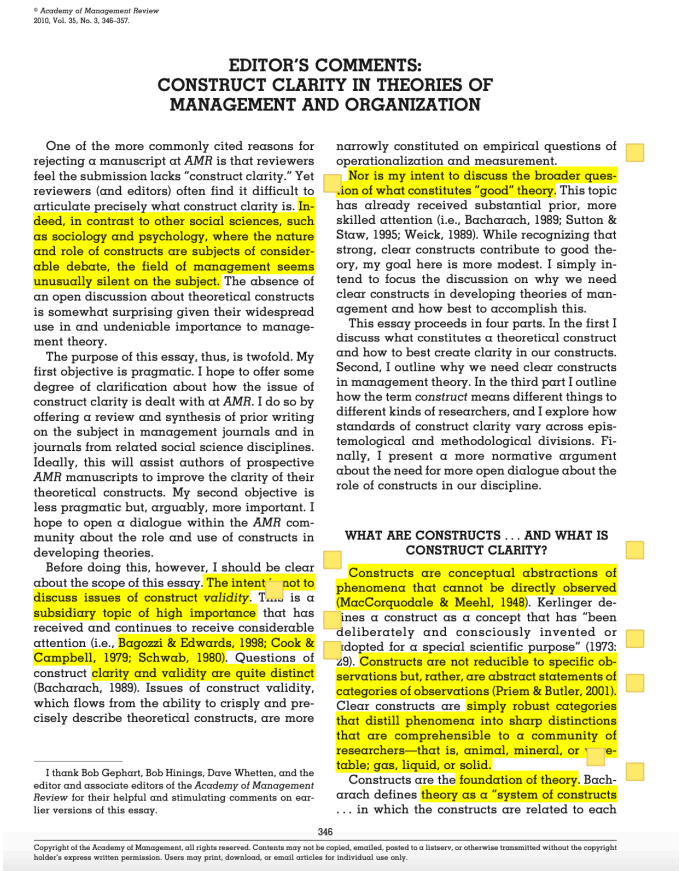
Readings for Today

Common Readings

1. Suddaby, R. (2010). Editor's Comments: Construct Clarity in Theories of Management and Organization. Academy of Management Review, 35(3), 346-357. https://doi.org/10.5465/amr.35.3.zok346
2. Van Maanen, J., Sorensen, J. B., & Mitchell, T. R. 2007. The interplay between theory and method. Academy of Management Review 32(4): 1145-1154.
3. Bagozzi, R. P., Yi, Y., & Phillips, L. W. (1991). Assessing Construct Validity in Organizational Research. Administrative Science Quarterly, 36, No. 3, 421-458. https://doi.org/10.2307/2393203

Suddaby (2010)

Clear constructs are simply robust categories that distill phenomena into sharp distinctions that are comprehensible to a community of researchers — that is, animal, mineral, or vegetable; gas, liquid, or solid. (Suddaby 2010, 346)



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2010, Vol. 35, No. 3, 346–357.

EDITOR'S COMMENTS: CONSTRUCT CLARITY IN THEORIES OF MANAGEMENT AND ORGANIZATION

One of the more commonly cited reasons for rejecting a manuscript at *AMR* is that reviewers feel the submission lacks "construct clarity." Yet reviewers (and editors) often find it difficult to articulate precisely what construct clarity is. Indeed, in contrast to other social sciences, such as sociology and psychology, where the nature and role of constructs are subjects of considerable debate, the field of management seems unusually silent on the subject. The absence of an open discussion about theoretical constructs is somewhat surprising given their widespread use in and undeniable importance to management theory.

The purpose of this essay, thus, is twofold. My first objective is pragmatic. I hope to offer some degree of clarification about how the issue of construct clarity is dealt with at *AMR*. I do so by offering a review and synthesis of prior writing on the subject in management journals and in journals from related social science disciplines. Ideally, this will assist authors of prospective *AMR* manuscripts to improve the clarity of their theoretical constructs. My second objective is less pragmatic but, arguably, more important. I hope to open a dialogue within the *AMR* community about the role and use of constructs in developing theories.

Before doing this, however, I should be clear about the scope of this essay. The intent is not to discuss issues of construct *validity*. This is a subsidiary topic of high importance that has received and continues to receive considerable attention (i.e., Bagozzi & Edwards, 1998; Cook & Campbell, 1979; Schwab, 1980). Questions of construct clarity and validity are quite distinct (Bacharach, 1989). Issues of construct validity, which flows from the ability to crisply and precisely describe theoretical constructs, are more narrowly constituted on empirical questions of operationalization and measurement.

Nor is my intent to discuss the broader question of what constitutes "good" theory. This topic has already received substantial prior, more skilled attention (i.e., Bacharach, 1989; Sutton & Staw, 1995; Weick, 1989). While recognizing that strong, clear constructs contribute to good theory, my goal here is more modest. I simply intend to focus the discussion on why we need clear constructs in developing theories of management and how best to accomplish this.

This essay proceeds in four parts. In the first I discuss what constitutes a theoretical construct and how to best create clarity in our constructs. Second, I outline why we need clear constructs in management theory. In the third part I outline how the term *construct* means different things to different kinds of researchers, and I explore how standards of construct clarity vary across epistemological and methodological divisions. Finally, I present a more normative argument about the need for more open dialogue about the role of constructs in our discipline.

WHAT ARE CONSTRUCTS . . . AND WHAT IS CONSTRUCT CLARITY?

Constructs are conceptual abstractions of phenomena that cannot be directly observed (MacCorquodale & Meehl, 1948). Kerlinger defines a construct as a concept that has "been deliberately and consciously invented or adopted for a special scientific purpose" (1973: 29). Constructs are not reducible to specific observations but, rather, are abstract statements of categories of observations (Priem & Butler, 2001). Clear constructs are simply robust categories that distill phenomena into sharp distinctions that are comprehensible to a community of researchers—that is, animal, mineral, or vegetable; gas, liquid, or solid.

Constructs are the foundation of theory. Bacharach defines theory as a "system of constructs . . . in which the constructs are related to each

I thank Bob Gephart, Bob Hinings, Dave Whetten, and the editor and associate editors of the *Academy of Management Review* for their helpful and stimulating comments on earlier versions of this essay.

Suddaby (2010)

Discussion Questions

- Do you agree with Suddaby's definition of a construct?
- Can you provide an example of a clear construct from your readings? Why is it so?
- How about a construct that is completely unclear? How could we make it better?

Suddaby (2010)

The essence of construct clarity comprises four basic elements (Suddaby 2010, 347).

- Definitions: skillful use of language to persuasively create precise and parsimonious categorical distinctions
- Scope conditions: circumstances under which a construct will or will not apply
- Semantic relationships: how does the construct relate to others
- Coherence: consistency with relation to overall theoretical argument

Van Maanen Sorensen and Mitchell (2007)

TABLE 1
Summary of Articles in the Special Topic Forum on the Interplay Between Theory and Method

Authors	Paper Title	Core Questions Addressed	Purpose of Paper	Emphasis on Theory or Method
Edmondson & McManus	"Methodological Fit in Management Field Research"	What does "methodological fit" mean, and how could it be applied to a research project?	To provide some decision rules to guide the methodological choices made by researchers	Roughly equal emphasis
Fiss	"A Set-Theoretic Approach to Organizational Configurations"	How do we alter the mismatch between theory and method in research on organizational configuration?	To introduce a new method of studying organizational configuration	Mostly method
Harrison & Klein	"What's the Difference? Diversity Constructs As Separation, Variety, or Disparity in Organizations"	Why have so few consistent findings emerged in research on diversity in organizations?	To develop guidelines for diversity research that recognize the varied forms of diversity	Mostly theory (construct refinement)
Harrison, Lin, Carroll, & Carley	"Simulation Modeling in Organizational and Management Research"	Where can simulation modeling contribute most effectively to organizational and management research?	To provide a broad description of the advantages (and special problem) of computational modeling in organizational studies	Roughly equal emphasis
Kalnins	"Sample Selection and Theory Development: Implications of Firms' Varying Abilities to Appropriately Select New Ventures"	How does sample selection influence theory development?	To reduce misinterpretation and inappropriate theoretical conclusions in studies where sampling is critical	Mostly theory
Alvesson & Kärreman	"Constructing Mystery: Empirical Matters in Theory Development"	How do we open up established theory to develop novel theorizing?	To show how "data" can be used to problematize established theoretical understandings and move toward new knowledge	Mostly method

Van Maanen Sorensen and Mitchell (2007)

Discussion Questions

- How does the interplay of theory and method play out when thinking about constructs and hypotheses?
- How might constructs enable or constrain variable identification and vice versa?

Van Maanen Sorensen and Mitchell (2007)

Key Points (Maanen, Sørensen, and Mitchell 2007, 1147)

Theory can drive method via:

- its stage of articulation
- the types of **constructs** it proposes
- its descriptive or pre scriptive nature.

Method can drive theory:

- analysis of configurations
- simulation modeling
- analysis of surprising or unexpected data (**variables**)

Bagozzi Yi and Phillips (1991)

Figure 1. Illustration of the confirmatory factor analysis model for four traits and two methods applied to the example drawn from Bagozzi & Phillips (1982).

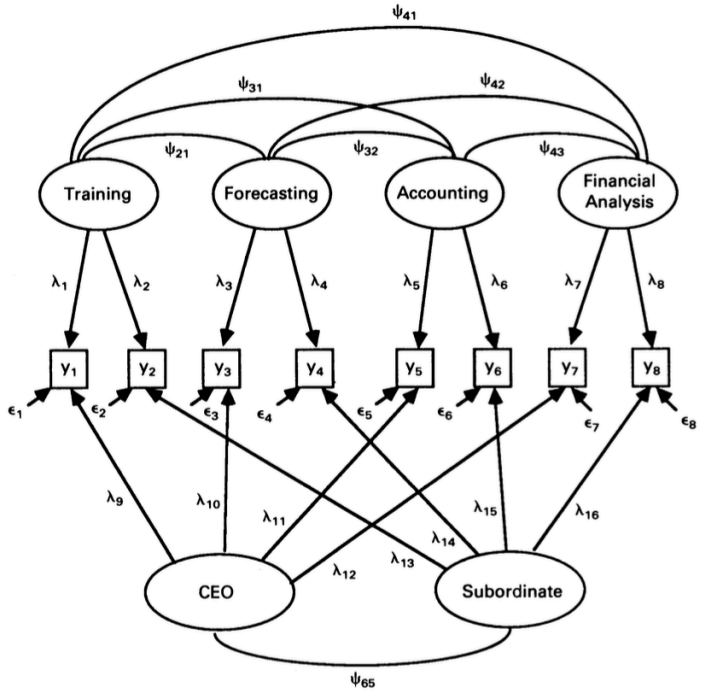


Figure 3: An example of an MTMM-centric CFA

Bagozzi Yi and Phillips (1991)

Discussion questions

- I know this was dense, what did you get out of this paper?
- Based on this paper, how can we demonstrate construct validity?
- Is this logic of all this just circular?

Bagozzi Yi and Phillips (1991)

Key Points

- Psychometric theory is predicated on a linkage between constructs and variables, different methods have different assumptions about their relationship
- Variables have multiple sources of relevant variation - construct/trait, method/measurement tool, and idiosyncratic error
- There are many ways to assess construct validity, each with its benefits and drawbacks

Break

COFFEE BREAK

Compare / Contrast Presentations

- Schaffer, J. A., DeGeest, D., & Li, A. 2016. Tackling the problem of construct proliferation: A guide to assessing discriminant validity of conceptually related constructs. Organizational Research Methods, 19: 80- 110.
- Law, K. S., Wong, C.-S., & Mobley, W. H. (1998). Toward a Taxonomy of Multidimensional Constructs. The Academy of Management Review, 23(4), 741. https://doi.org/10.2307/259060

Validity assessments

Moving from a summation to tutorial focus

Going forward, our "lecture" period will move away from tying the various papers together and rather using them as a gateway for us to talk about different tools and techniques for performing analyses

Types of validity: Construct-centric

- Criterion validity: The extent to which an operationalization of a construct relates to, or predicts, a theoretically related behaviour or outcome (Cronbach and Meehl 1955, 282) (i.e., semantic relationships and coherence)
- Content or "Face" validity: The extent to which the construct is comprises a sample of a universe in which the investigator is interested (does it look like a duck and quack like a duck?) (i.e., defintion and scope conditions) (Cronbach and Meehl 1955)

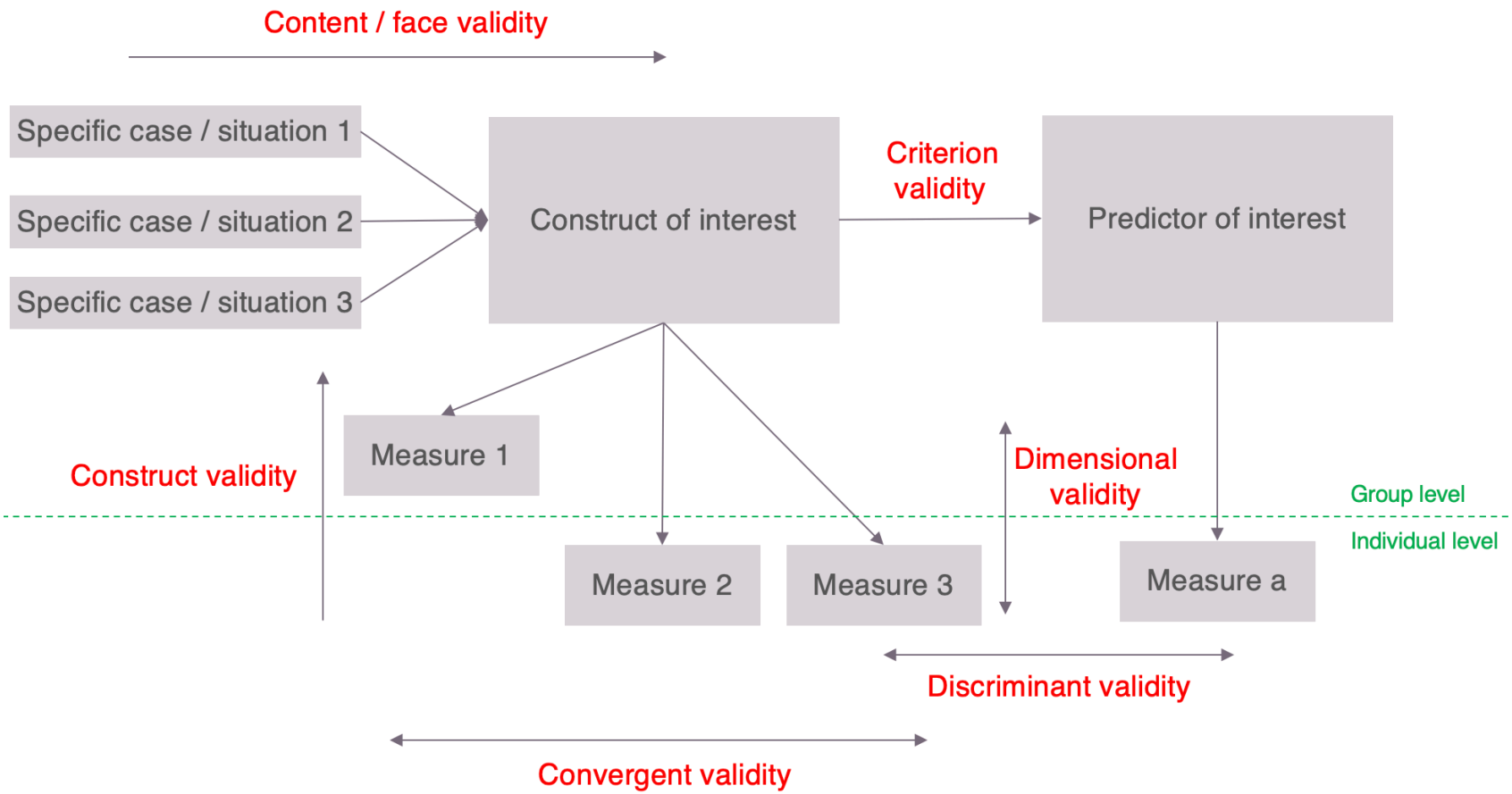
Types of validity: Construct-variable interface

- "Dimensional" validity: The dimension of the constructs and the measures are appropriately specified with due attention paid in operationalization (Law, Wong, and Mobley 1998)
- Construct validity: The extent to which an operationalization measures the concept it is supposed to measure (Bagozzi, Yi, and Phillips 1991, 421)

Types of validity: Variable-centric

- Convergent validity: The degree to which multiple attempts to measure the same concept are in agreement (Bagozzi, Yi, and Phillips 1991, 425)
- Discriminant validity: The extent to which measures of theoretically distinct constructs are unrelated empirically to one another (Campbell & Fiske, 1959) (Shaffer, DeGeest, and Li 2016)

One possible visualization of validity elements



Common tools for assessing validity

- Cronbach's alpha (convergent validity)
  - there are many other "congeneric" tests
- Multi-trait, multi-method matrices (MTMM) (convergent + divergent)
  - this is the canonical approach but relatively inflexible
- Confirmatory factor analyses (convergent + divergent)
  - As (Bagozzi, Yi, and Phillips 1991) notes, there are many versions of this
- A whole bevy of tools for multi-level constructs
  - Some examples include ICC, Rwg, among others

Where does qualitative work fit into all of this?

One interpretation is that qualitative work helps to ascertain the bounds of a construct of interest are and the face validity of any constructs that are subjected to quantitative analyses

Where does actual data fit into all of this?

Where are our measures coming from?

How might data availability enable or constrain the our ability to successfully explore the various elements of the above diagram?

Preparation for next class

Next class

Elements IV: Data and measures

1. Stevens, S. S. 1946. On the Theory of Scales of Measurement. Science, New Series, 103, No. 2684, 677-680.
2. Bedian, A. G. 2014. "More Than Meets the Eye": A Guide to Interpreting the Descriptive Statistics and Correlation Matrices Reported in Management Research. Academy of Management Learning & Education, 13, No. 1, 121-135.
3. Heggestad, E. D., Scheaf, D. J., Banks, G. C., Monroe Hausfeld, M., Tonidandel, S., & Williams, E. B. (2019). Scale Adaptation in Organizational Science Research: A Review and Best-Practice Recommendations. Journal of Management, 45(6), 2596-2627.

Next class

Elements IV: Data and measures

4. Compare / Contrast

- Combs, J. G. 2010. Big samples and small effects: Let's not trade relevance and rigor for power. Academy of Management Journal, 53(1): 9-13.
- Simsek, Z., Vaara, E., Parachuri, S., Nadkarni, S., & Shaw, J. D. 2019. New ways of seeing big data. Academy of Management Journal, 62: 971-978.

References

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Bagozzi, Richard P., Youjae Yi, and Lynn W. Phillips. 1991. "Assessing Construct Validity in Organizational Research." *Administrative Science Quarterly* 36, No. 3: 421–58.

Cronbach, Lee J., and Paul E. Meehl. 1955. "Construct Validity in Psychological Tests." *Psychological Bulletin* 52 (4): 281–302.

Fox, Brian C., Sergio Grove, and David Souder. 2021. "When Good Deals Need Help Getting Done: Articulating Side Payment Strategies." *Long Range Planning* 54 (6): 102072.

Law, Kenneth S., Chi-Sum Wong, and William H. Mobley. 1998. "Toward a Taxonomy of Multidimensional Constructs." *The Academy of Management Review* 23 (4): 741.

Maanen, John Van, Jesper B. Sørensen, and Terence R. Mitchell.