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Chapter 2 – Scientific Methods

A. Operational Definitions
- Define an abstract construct in terms of specific procedures and measures
- May differ among studies (eg. corporate success may be defined in terms from its annual profits, total annual revenue, bonuses or the increased of stock value over time)
- Construct Irrelevance Variance – increase of stock value may be relevant to the construct but it may not represent the complete measure of the corporation's performance
- Construct Underrepresentation – degree to which the operational definition fails to capture important aspects of the construct

Factors Affecting Validity Coefficients

1. Range Restriction
   - When measurements are made on a subgroup that is more homogeneous than the larger group from which it is selected, the validity coefficients of the subgroup are likely to be smaller than the one from the larger group
   - This reduction in the size of the validity coefficient due to the selection process is called range restriction
   - Statistically, the magnitude of correlation coefficients, including validity coefficients, decreases as the similarity and homogeneity of characteristics being measured increases
2. Measurement Error
   - Mathematically, the size of a validity coefficient cannot exceed the reliability of the measures used to obtain the data (upper limit of validity)
   - The decrease in magnitude of the validity coefficient associated with measurement error of the predictor, the criterion, or both is called attenuation
3. Sampling Error
   - Validity coefficient is an estimate of what the coefficient is for the entire population
   - Estimates of validity within a population may vary between sample sizes

Bias – systematic errors in measurement, or inferences made from measurements that are related to different identifiable group membership characteristics such as age, sex or race

- Predictive bias occurs when errors in prediction are made for members of a subgroup
- Differential Prediction – the predicted, average performance score of a subgroup, is systematically higher or lower than the average score predicted for the group as a whole
- One way to eliminate this bias is to generate separate regression lines (separate prediction formulas)
- Other more complicated types of bias might occur in a set of measurements. The items on a test may elicit a variety of responses other than what was intended, or they may have different meanings for members of different subgroups (eg. pictures of tools mostly used by males, women may not do as well on the test due to unfamiliarity)

Fairness – the principle that every test taker should be assessed in an equitable manner (value judgments)

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- Sometimes empirical measures may still be viewed as unfair (eg. Canada is selecting people for civil service – test is unbiased – francophone applicants scored above Anglophones)
- Fairness involved perceptions – different people perceive different things as fair, no single definition
- Achieving fairness often requires compromise between conflicting interests

Ethics – the determination of right and wrong; the standards of appropriate conduct or behavior for members of a profession; moral and immoral

- A difficult subject because it is a grey area between behaviors that are illegal and noble
- Balancing the rights and interests of organizations with those of workers, as well as the rights and interests of them with those of larger society

CPA Code is based on 4 ethical principles:

1. Respect for the dignity of persons
2. Responsible caring
3. Integrity in relationships
4. Responsibility to society

- Central to the work of I/O Psychologists

Research in Organizational Settings

1. Need for new measures

- Over rely on retrospective surveys and ignore the potential for other methodologies
- New technologies may physiological measures affordable and practical in assessing work related constructs such as affect and emotion

2. Participant Burnout

- Employees are asked to participate in too many surveys
- Lack of motivation to do the survey
- Don't see the value in participating
- Overcome by giving meaningful feedback; tell reasoning for survey, etc.

3. Employee Mistrust

- High degree of suspicion to organizational researchers
- Lack of clarity between researchers and employees (who is the client?)

4. Overreliance on Correlational Methods

- Different methodologies should be used to examine an issue, as each provides a different perspective on what may be the true state of affairs
- Costly, but new knowledge is worth it

5. What we can learn from others

- We tend to ignore qualitative methods but they may provide valuable insights
- Not only use the set of specific methods that are presented

6. Demonstrating Value

- Organizations need to see both the relevance and value of the research, and it is up to the researcher to make these connections – must be meaningful to the organization