Criminology and Forensic Studies Discipline (CFSD)

Module:
Research Methodology: Criminology
(CRIM309) (H1) (16 credits)

LECTURE: QUANTITATIVE MEASUREMENT
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The primary aim is to test theories about phenomena, in such a way that knowledge of the universe is built up, with one theory becoming the basis for other research questions, until the phenomenon is completely understood. In other words, knowledge mirror reality *(empirical observation).*
Research problem *(example)*

Real transformation of the nature and style of policing in South Africa that had denied the human rights of the majority of South Africans to gaining the trust and respect of all citizens in democratic South Africa
Literature review (example)

Search: deductive (general to specific) or inductive (specific to general)
Theoretical assumption: if change occurred such change would be evident in the organisation’s culture
General research question (*example*)

Has the police culture changed?

Specific research question (*example*)

Are there any indicators evincing the presence of traditional police culture themes of solidarity, isolation, and cynicism attitudes amongst a representative sample of South African Police Service (*SAPS*) police officials, ten (*10*) years after they commenced their basic police training at the various SAPS basic training institutes in January 2005?
An **independent variable** is thought to influence, affect, or cause variation in another variable.

A **dependent variable** is thought to depend upon or be caused by variation in an independent variable.
Two broad options

Option 1: manipulate the independent variable *(that is, intervene)* and then observe whether this results in changes in the dependent variable

Option 2: Observe already occurring, naturally occurring changes in the two variables *(X and Y)* and note whether changes in X are associated with changes in Y
Hypothesis (*example*)

A representative sample of South African Police Service (*SAPS*) police officials with ten (10) years experience have indicators evincing attitudes in support of orthodox police culture themes of solidarity, isolation, and cynicism, in July 2014. It is implied that the presence of these attitudes, albeit limited in generalisation, argue against progressive transformation of the SAPS’s organisational culture.
Quantification of constructs

Criteria:

**Correspondence** – numbers must represent or correspond with reality

**Representation** – the measure of the attribute must quantify a real attribute in the world

**Objectivity** – the rules used to assign numbers to quantities of the attribute must be based on reliable, objective laws
Scales or levels of measurement

Level at which a variable is measured: gross or more refined

Discreet variables
(whole numbers or fixed set of values)

Nominal/categorical measurement scales

Ordinal levels of measurement

Continuous variables
(Theoretically infinite number of values)

Interval level measures

Ratio scale measures
Let’s assume that you are interested in whether teachers who have lower morale are more likely to drink more alcohol. To investigate this hypothesis you would need to find a way of measuring the constructs ‘teacher morale’ and ‘drinking’. You define ‘morale’ as a feeling or mental condition involving confidence, optimism, cheerfulness, feelings of togetherness, and a willingness to endure hardship for the common good. According to this definition, morale can be high or low. Following from this, high ‘teacher morale’ would include saying positive things about the school, not complaining about the work-load, enjoying being with the pupils, etc., whereas low ‘teacher morale’ would include such behaviours as looking for other jobs. You could even break the construct down into several dimensions, such as ‘regard for pupils’, and ‘regard for other teachers’. You’d also have to distinguish the concept from other related concepts such as ‘optimism’, ‘mood’, etc.
Develop a concrete quantitative indicator of the construct ‘teacher morale’, in such a way that you would be able to say that someone who obtains a high score on the measuring instrument has high teacher morale. To do so, you’d need to operationalise each variable (‘teacher’ and ‘morale’) and each dimension of the theoretical definition. In addition, you’d need to conceptualise and operationalise the second variable in the hypothesis, which is ‘drinking alcohol’. You could measure this by developing questions about ‘drinking behaviour’, which is a construct that has to be first conceptualised and then operationalised in the same was for the concept ‘teacher morale’. So, for example, you might conceptualise ‘drinking behaviour’ as having 3 dimensions: frequency of drinking, quantity consumed per drinking occasion and behavioural impairment. You would then operationalise each of these 3 dimensions by constructing questions which tap these (e.g. *to tap the third dimension, you might ask how often the person misses work as a result of drinking, or how often there is family conflict as a result of the drinking*).
The operational definition must correspond with the conceptual definition \textit{(and thus with the attribute in the real world)}

MEASUREMENT VALIDITY refers to the degree to which the measuring instrument is a good reflection of the conceptual and operational definitions.

3 Types of validity
- Criterion-related validity
- Content validity
- Construct validity

- Predictive validity
- Concurrent validity
- Convergent validity
- Discriminant or divergent validity
If the measure of teacher morale does not fit with the conceptual definition of teacher morale, then it is not valid (content validity); if it correlates with other pre-existing measures of the same construct, then it would have criterion-related concurrent validity; if it predicts future events (such as teachers with low morale ultimately resign), then it would have criterion-related predictive validity.
The measure must be consistent and dependable. In other words, measure the same attribute in the same way with the same results on the same subjects.

If the measure yields a consistent result each time it is given to the same person, then it would be said to have test-retest reliability.

A measure has internal consistency *(which is an indirect measure of reliability)* if the scores amongst all the individual items of the gauge are highly correlated.

If a measure is unreliable, then it is also invalid.

The more clearly conceptualised and operationalised the construct, the more the measurement is likely to be reliable.
The higher the reliability and validity of the test or instrument used in the research, the lower the measurement error (which refers to the situation in which a difference in the scores of two different persons is due not to the differences in the attribute/variable being measured, but due to other factors, such as differences in their moods or level of anxiety at the time of testing, differences in the testing-environment, such as lighting and noise levels, etc).
College of Humanities
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- Tests
- Interview questionnaires
- Focus groups
- Data triangulation
- Historical analysis
- Diary techniques
- Direct observations
Thank you