



Conceptual Variables ^[1]

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Conceptual variables are often expressed in general, theoretical, qualitative, or subjective terms and important in hypothesis building process.

Two levels of abstraction exist for our research activities and our understanding of research outcomes. Everyone understands at conceptual level. For example, if you say "Computer games sharpen children's minds" expresses a belief about a causal relationship ^[3] at a conceptual level. At this level of abstraction, the variables are called constructs ^[4] or conceptual variables.

Constructs are the mental definitions of properties of events of objects that can vary. Definitions of computer games and mental sharpness are examples of such constructs.

Now, computer games and mental sharpness need be defined and explained. It is important to note that the empirical research activities are carried out at an operational level of abstraction and empirical research ^[5] acquire scores from cases on measures. These measures represent operational variables ^[6]. The variables ^[7] can be made operational by the measures used to acquire scores from the cases studied ^[8]. For example, a question that asks children how many hours a day they play computer games is an operational measure children's interest in computer games.

Conceptual variables ^[9] are often expressed in general, theoretical, subjective, or qualitative terms. The research hypothesis ^[10] is usually starts at this level, for example. "Effect of nicotine patch is poorer among people lacking mental determination to quit smoking".

To measure conceptual variables, an objective definition is often required. This may involve having an easily available validated instrument, inferring an operational variable from theory, establishing consensus or all three. In above example, we need to have a definition of effect of nicotine patch and mental determination.

During this process, one needs to decide on measurement scale. The researcher may decide to make effect of nicotine patch: yes/no" (nominal), or "none/low/moderate/high (ordinal) based on definition of potency of a patch. For mental determination to quit smoking, you may need to do the same: present/absent, or, more likely, use some ordinal scale based on a predesigned questionnaire ^[11] or third party evaluation.

Another example: if this is stated that

"The recovery in diabetic patient was quick among those patients without concurrent cardiovascular problems"

Now, the recovery needs to be converted into some measurable variable [6] e.g.

"maintenance of glucose levels over one year (continuous scale), as does cardiovascular problems, e.g."

No history of previous heart attack, normal findings of ECG/Echocardiography/Color Doppler and cardiac enzymes etc for evaluation of cardiovascular status (continuous scale).

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