SUPER LAB

We must know, we will know

Chemistry Handout

A handout for IBDP Chemistry

Author: Sam Ren

Institute: Super-lab Project

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Wir müssen wissen,wir werden wissen

We must know, we would know

Contents

Chapter 1 Method in Psychology

1.1 Research

Definition 1.1 (Quantitative research)

Quantitative research is a research method which

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Definition 1.2 (Qualitative research)

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Property

- *It is unstructured*
- *Semi-structure(half structured)*
- *Focus groups*

Definition 1.3 (Sampling technique)

Sampling technique is a method to choose people from the population.

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Theorem 1.1 (Types of sampling technique)

In general the familiar sampling techniques are:

- *Random sampling*

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1.1.1 Variables

Definition 1.4 (Variables)

Variable is a changeable value and whose associated value may be changed.

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1.1.2 Research designs and methods

Definition 1.5 (Repeat Measure design)

Repeat Measure Design is a kind of research design which contains several different conditions but in the same sample.

♣

Theorem 1.2 (Evaluation of RMD)

- *The order effect (The sample will be influenced by the test before)*
- *Demand characteristics(The sample will realized the aim of the test and be influenced)*

♡

Definition 1.6

Independent measure design is research design which it separate the sample in to groups which in different conditions.

♣

Theorem 1.3 (Evaluation of IMD)

- *The participants variables may be a confounding variables(extraneous variables)*

Chapter 2 Abnormal Psychology

2.1 Diagnosis

2.1.1 Reliability and validity

For a classification system to be **valid**, it should be able to classify a pattern of symptoms that can then lead to an effective treatment.

Definition 2.1 (Validity)

*The **validity** of a diagnosis is whether the diagnosis is correct and leads to a successful treatment.* ♣

Corollary 2.1

The different types of validity.

- *Predictive validity*
- *Descriptive validity*
- *Etiological validity*
- *Convergent validity*

♡

Example 2.1 If the quiz we give patient to measure is the same of the illness. Then it is high Validity. (For example an anxiety patient will be given an anxiety quiz sheet)

Another limitation of classification systems is their level of reliability. For a classification system to be reliable, it should be possible for different clinicians, using the same system, to arrive at the same diagnosis for the same individual.

Definition 2.2 (Reliability)

*The **reliability** of a diagnosis is whether two or more psychiatrists using the same classification system make the same diagnosis.* ♣

Corollary 2.2

The different types of reliability.

- *Test-retest-reliability(between two tests)*
- *Inter-rater reliability(between doctors' diagnosis)*

♡

Here is the study of this chapter.

Proposition 2.1 (Rosenhan(1973))

Rosenhan wanted to test the validity of psychiatric diagnoses as well as determine the negative consequences of institutionalization.
He conducted a field study where eight healthy people tried to gain admission to 12 different psychiatric hospitals. They complained that they had been hearing voices. The voices were unfamiliar, of the same sex and said single words like "empty" or "thud". These were the only symptoms they reported. Once they were admitted to the hospital, they immediately stopped reporting symptoms and act "normally." Seven of the pseudo-patients were diagnosed as suffering from schizophrenia.

After the individuals had been admitted to psychiatric wards, they all said they felt fine, and that they were no longer experiencing the symptoms. It took an average of 19 days before they were discharged. For all of the pseudo-patients, they were discharged with a diagnosis of "schizophrenia in remission", implying that the schizophrenia might come back.

During hospitalization the pseudo-patients experienced very little contact with doctors and what they considered to be "a lack of normal interaction" with the staff, feeling that the replies from the nursing staff were lacking eye-contact and a personal connection. In addition, the staff interpreted the patients' normal behaviour –for example, note-taking –as abnormal.

Rosenhan concluded that "It is clear that we cannot distinguish the sane from the insane in psychiatric hospitals. The hospital itself imposes a special environment in which the meaning of behavior can easily be misunderstood. The consequences to patients hospitalized in such an environment –the powerlessness, depersonalization, segregation, mortification, and self-labeling –seem undoubtedly counter-therapeutic."

The study played a key role in raising awareness about the way that diagnosis is carried out and the treatment that patients receive in mental hospitals. Rosenhan showed that when people come into a hospital, it is assumed that there is a problem that needs treatment. Then, once a diagnosis is made, health professionals may notice behaviours that they believe are in line with the diagnosis –what is called confirmation bias.

The study was highly influential in promoting change in hospital practice, protecting the rights of the patients. In addition, today diagnostic manuals are much more complex and psychiatrists are encouraged to practice data triangulation in diagnosis. But was does Rosenhan' s study really teach us about the validity of diagnosis?

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Theorem 2.1 (Limitation of study)

When discussing the validity of diagnosis, this study has several limitations:

- *The study is unethical because no consent was given by the people working in the hospitals. In addition, deception was used by the confederates. Rosenhan did not debrief the hospitals on his findings or allow them to withdraw from the study. Some consider the outcome of the study important enough to justify the lack of consent.*
- *There is no way to verify the validity of the claims made by the "patients." Rosenhan wrote that the nurses saw note-taking as an "aspect of their pathological behaviour." However, the nurses' notes simply said: "engages in writing behaviour." This is an example of researcher bias.*
- *Only a single disorder was studied –schizophrenia. It is not possible to say from this single study that diagnostic systems are therefore invalid.*

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Chapter 3 Developmental psychology

3.1 Cognitive developmental(Depends on Piaget)

Definition 3.1 (Cognitive development)

Cognitive development studies how a child develops over time in terms of thinking, problem-solving, language, perception and information processing.

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Theorem 3.1 (Piaget's theorem)

Piaget claimed that children' s development progresses through a series of cognitive stages, with each stage having distinctly different qualities. He saw the stages as a way to describe changes in the logic of thinking.

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- Stage 1: Sensorimotor intelligence (age 0–2 years)
  In the Sensorimotor intelligence, **the newborn baby relies on innate reflexes and has limited knowledge**.
- Stage 2: Pre-operational thought (age 2–7 years)
- Stage 3: Concrete operational thought (age 7–12 years)
- Stage 4: Formal operations (from age 12)

Proposition 3.1 (Mountain task: Piaget and Inhelder (1956))

In Piaget and Inhelder's classic three mountain task, children were shown a three-dimensional display of a mountain scene. They were then asked to choose a picture that showed the scene they had observed. In general, the children were able to do this with little difficulty.

In the next part of the experiment, a child was asked to look at the model of three mountains. The researcher then placed a doll in various positions in the model. The child was shown different pictures and asked to choose the one that showed what the doll would see from its position.

When four-year-olds were asked to select a picture showing what a doll sitting across the table would have observed when looking at the mountain, they chose the image that reflected their own viewpoint. Piaget used this to show the egocentrism of children - that is, their inability to see another person's perspective. By the time children reached the age of seven, they were able to do this task with little problem.

There has been criticism of this study. Some claim that young children are able to take another person' s perspective if the material used is more familiar than that used for the three-mountain task. Some argue that this task is not similar to what children experience in everyday life. A study by Hughes (see next box) challenged Piaget's findings.

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Theorem 3.2 (Evaluation of Study)

Strengths of Piaget

- *The first theory of its kind. His theory that cognitive changes are driven by biological maturation is widely accepted and supported.*
- *Research consistently supports the progression of cognitive development as outlined by Piaget.*
- *Piaget has had a major effect on education.*
- *The theory has cross-cultural support.*

Limitations of Piaget

- *The original studies used tasks that were too language-dependent and were not age-appropriate for the children.*
- *Much of the research was cross-sectional in design - not observing the cognitive development of individual children over time, but comparing performance on cognitive tasks at different age levels.*
- *As seen in later research, the ages at which the stages begin has been criticized. Evidence shows that often children enter the stages earlier than Piaget predicted.*
- *The theory is descriptive rather than explanatory.*

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3.2 Cognitive development(Depends on Vygotsky)

Definition 3.2 (Vygotsky's cognitive theory)

Vygotsky's sociocultural theory suggests that a child's cognitive development is based on interaction with other people in order to develop cultural tools to understand the world.

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Theorem 3.3 (zone of proximal development)

*The concept of the **zone of proximal development**, which refers to the difference between what a child can achieve independently and what a child can achieve with guidance and encouragement from a more knowledgeable other. A child can increase in competence if he or she receives assistance to perform a task that is just slightly beyond his or her current ability. This is called scaffolding. Successful scaffolding can change the child' s level of performance on a particular task.*

♡

Proposition 3.2

Vygotsky argued that social interaction was the key to development and learning. Nichols (1996) carried out a study to find out if children working in groups would learn more effectively than if they were working alone.

90 American high school students were randomly allocated to one of three groups for one semester. One group had a half-semester of collaborative group learning and then a half-semester of traditional lecture. The second group had a half-semester of lecture and then a half-semester of collaborative group learning. The third group had a full semester of traditional instruction.

It was found that groups 1 and 2 showed significantly higher levels of motivation than group 3. In addition, motivation was highest during the collaborative group learning part of the course. This supports

Vygotsky's theory that social interaction promotes development.

Evaluation of Vygotsky's sociocultural theory of cognitive development

- The theory has been successfully applied in teaching - for example, in the use of scaffolding and cooperative learning.
- The theory takes a more holistic view of development than Piaget's theory.
- There is a lack of empirical support for some of his theories - especially with regard to the role of language in development.