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The diagnostic poll method Measurement in scientific research

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Oznaczenie Licencyjne

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THE DIAGNOSTIC POLL METHOD

COMPLETE THE SURVEY





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According to T. Pilch

the diagnostic poll method is a means of acquiring knowledge about the structural and functional attributes, as well as the dynamics of social phenomena, the opinions and views of selected groups, the increase and direction of the development of defined phenomena and all other institutionally non-local phenomena, which have educational meaning, basing on a specially chosen group which represents the general populace in which a phenomenon occurs.

Prof. Dr hab. Tadeusz Andrzej Pilch (born July 26, 1939 in Bielcza) – Polish educator, retired full professor of the University of Warsaw, honorary doctorate of the University of Białystok, former Deputy Minister of Education (1992, 1993–1995). He deals with social pedagogy and social policy.





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In M. Łobocki's opinion

- the poll method should be used especially when one wants to learn the respondents' opinions on matters one is interested in, and how these matters are perceived/judged, and what the respondents know or would like to know about them in general.

Mieczysław Łobocki (born August 18, 1929 in Starogard Gdański, died August 6, 2012 in Lublin) – Polish educator and psychologist, professor at the Maria Curie-Skłodowska University in Lublin. He mainly dealt with the issues of modernizing educational methods in the family, in care and educational institutions and in schools, the methodology of pedagogical research, as well as the social maladjustment of students.





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The poll method, called the representative sampling method (it polls someone's opinion on a subject), **is a means of gathering information on the phenomena that the researcher finds interesting, and is based on polling the opinions and views of people** selected using a specific point of view, for example students, the work-force, religious people, and so on.

This method allows acquisition of information about

- 1. the personal-and-work-related characteristics** of a given person; this can be information regarding the gender, age, place of residence, wealth, or marital status of a respondent,
- 2. the state of social awareness of the respondents participating in the study.** It can pertain to all the phenomena the researcher is interested in,
- 3. opinions about events,**
- 4. numerical data.**



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Technique

Interview

- Open
- Hidden
- Team
- Unit

Survey

- Distributed
- Audience
- Mailing
- Internet
- Press
- Public
- Categorised
- Non-categorised



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Distributed survey

Pros

- High completion
- Short time of measurement
- High degree of sample control

Cons

- High costs
- The need to enrol pollsters
- Low feeling of anonymity in the respondent



Audience survey

Pros

- High completion
- Short time of measurement
- Low costs
- Uncomplicated organisation of measurement
- High degree of sample control
- The possibility to present additional materials (audio-visual for example)
- The conditions of carrying out the measurement are the same for all the respondents

Cons

- The need to enrol pollsters
- The need to use short questionnaires
- The need to assemble many respondents in one place
- Low feeling of anonymity in the respondent



Mailing survey

Pros

- The possibility to measure a large group of respondents
- Simple organisation of measurement
- Eliminating the influence of the pollster on the course of the study
- The possibility to use questions which the respondent would be reluctant to answer verbally
- Avoiding haste

Cons

- High cost of implementation
-  Low completion rate (usually 15-20% or less)
- Long time of measurement
- Low degree of sample control
- The need to prepare mailing lists
- No influence over the sequence of responses and skipping questions



Internet (www) survey

Pros

- The possibility to measure a large group of respondents
- Low costs
- Speed of measurement
- Uncomplicated organisation of measurement

Cons

- Questionnaire is visible/available to the competition
- Low degree of sample control
- No possibility to carry out the study in certain professions or social groups



Press survey

Pros

- Uncomplicated organisation of measurement
- The possibility to measure a large group of respondents
- High feeling of anonymity in the respondent

Cons

- High costs
- Low percentage of completion
- Low degree of sample control
- The need to use short questionnaires
- Questionnaire is visible/available to the competition



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Survey technique rules

- Correctness of formulating questions in a questionnaire and the instructions that precede them,
- Verifying the questions in a pilot study



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The types of questions

I. Criterium – the mood of a sentence

1) Questions:

- *Are you happy?*

2) Commands:

- *Please indicate ...*
- *Please list ...*
- *Please provide ...*

3) Statements of fact:

- *I will be grateful for indicating the most important characteristics of a good nurse*



Types of questions

II. Criterium - Freedom of answer

1) Open questions - they leave the respondent absolute freedom in giving an answer:

- *Which forms of physical activity do you prefer?*
- *Which tests did you have done during your pregnancy?*

2) Closed questions - (multiple choice questions / categorised questions / list of possible answers) - they contain predetermined answers which the respondent selects.

- Alternative questions (questions of resolution / dichotomous questions) - They start with an auxiliary verb *Do/Did/Have/Are/Were ...*, and the possible answers can be:

yes / no; I agree / I disagree

Do you perform a self check-up of the breasts? Yes / No



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Types of questions

II. Criterium - Freedom of answer

- 1) **Single-choice questions** - they require the respondent to choose a single answer from a larger number of answers

*Which form of spending free time do you prefer (please select **only one** of the listed forms):*

- a) *Reading books,*
- b) *Listening to music,*
- c) *Watching TV,*
- d) *Talking with friends,*
- e) *Crafts,*
- f) *Running,*
- g) *Swimming.*



Types of questions

II. Criterium - Freedom of answer

- 2) Multiple-choice questions** - they are questions with more than two possible answers and require choosing more than one answer

*Which forms of spending free time do you prefer (please select only **three most frequently performed**):*

- a) Reading books,*
- b) Listening to music,*
- c) Watching TV,*
- d) Talking with friends,*
- e) Crafts,*
- f) Running,*
- g) Swimming.*



Types of questions

II. Criterium - Freedom of answer

- 3) Half-open questions** - these types of questions first list answers to the question, but then leave a space for adding an answer that is not there or give the option to say "other"

Which forms of spending free time do you prefer (please select only three most frequently performed):

- a) Reading books,*
- b) Listening to music,*
- c) Watching TV,*
- d) Talking with friends,*
- e) Crafts,*
- f) Running,*
- g) Swimming,*
- h) Other*



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Instructions

- **Should precede the questions,**
- **Inform about:**
 - *the rules of providing answers,*
 - *recommendations and cautionary advice related to the questions,*
 - *the person who is conducting the study,*
 - *the goal of the study,*
 - *providing anonymity,*
 - *voluntary participation in the research,*
 - *discretion,*
 - *the way the data will be used.*



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Pilot study

Aim:

- correcting or changing questions which are unclear or were not understood;
- Allows checking the correctness of the instructions,
- and the influence on the motivation of the respondents to participate in the study.

*Around **10%** of the planned study sample should take part in the pilot study.*



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MEASUREMENT IN SCIENTIFIC RESEARCH





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- Measurement is assigning certain symbols to the characteristics of measured objects.
- There are four levels of measurement, determined by the scale being used:
 - nominal,
 - ordinal,
 - interval,
 - ratio.



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Nominal scales

- Related to categorised data, that is such that can be associated with some class of objects without ordering them, for example:
 - **Gender** - M-F,
 - **Race** - Caucasian - Negroid - Mongoloid,
 - **Presence of a given disease entity**

One only states if the data is identical or if it differs.

There is no basis for determining the intensity of the data.



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- They are the lowest type of measurement scale. The basis for categorisation is the qualitative features of phenomena.

Male		Female
0	Numbers	1
♂	Symbols	♀
Man	Names	Woman

- Examples of characterization in a questionnaire by alternative nominal scales with binary classification:

Question:

Q.1. Are you currently actively working as a midwife?

a) Yes b) No



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- **Non-alternative** nominal scales (with multi-category classification) have at least three classes. The only requirement is the unambiguity of the classification.

Question:

What were the motives that led you to choose the profession of midwife:

- a) calling,
- b) the social prestige of the profession,
- c) cooperation with a therapeutic team,
- d) financial aspects.

Quantification of the gathered data using nominal scales is done by counting and not by measuring.

Operations can be made on **the results of counting** and not on the numbers arbitrarily assigned to given classes (for example men - 0, women - 1).



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Statistical analysis of the data from nominal scales:

- Sample sizes and proportions (*descriptive statistics*)
- Fractions and percent (*descriptive statistics*)
- Modal value (*descriptive statistics*)
- Rates (ratios) (*descriptive statistics*)
- Non-parametric tests (*inductive statistics*)



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Ordinal scales

- They allow to both perform a **division into categories** and determine the direction of the change in the intensity of a feature characterising the division.
- Features are classified the same as in the nominal measurement but additionally they are ordered according to a relation of lesser-greater, weak-strong, little-a lot, and the like. Ordinal measurement does not provide information about the size of the differences between the intervals. The reason for that is **there is no unit of measurement**. Arithmetic operations cannot be performed on them. It is, however, possible to use a relationship of "less than".



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Ordinal scales are often used to measure the preferences and attitudes of buyers.

Types of ordinal scales:

- 1) unipolar scales,
- 2) bipolar scales,
- 3) graduated,
- 4) continuous scales.



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- **Continuous scales** don't have markings featured. They are a continuum ranging from the highest to the lowest degree, or the other way around.

0 - No pain

10 - The worst
unimaginable pain



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Statistical analysis of data from ordinal scales:

- modal value and median,
- no average can be calculated,
- the tools that are used for verifying hypotheses using nominal and ordinal measurements are non-parametric statistical tests.



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Interval (unit) scales

They allow to state the evenness of the spacing between the intervals of the scale. Examples of these are scales of temperature, time, and the like. They allow assessing both the direction of the change in the intensity of a feature, and the distance between the results of measurements. A 5 kg difference in the weight of a patient is the same for a pair of measurements of 65 and 60 kg, or 82.5 and 77.5 kg.

Example:

- scales of temperature, time, etc.
- often ordinal scales are treated as interval ones, which means one tries to measure features which do not have a unit of measure.





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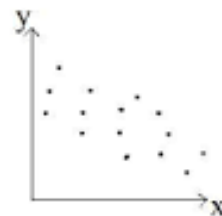
Interval (unit) scales

It enables completely free use of any statistical technique, including:

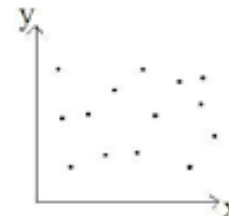
- arithmetic mean
- standard deviation
- correlation coefficients

$$\bar{x} = \frac{x_1 + x_2 + x_n}{N}$$

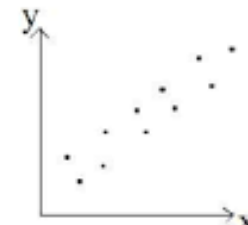
$$\sigma = \sqrt{\frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n - 1}}$$



negative correlation



no correlation



positive correlation



Ratio (proportion) scales

- Due to there existing a constant natural zero point and a natural unit of measure it is possible here to perform measurements at the highest level.
- Example:

Water breaking	First phase	Second phase	Third phase	Fourth phase
Point 0				
- Time in minutes				

Data gathered from ratio measurements can be analysed using all available methods of descriptive and inductive statistics.



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Measurement reliability

- This instrument gives **accurate** results when one measures the characteristic that one wants to measure.
- Accurate results are devoid of **systematic errors**.
- This instrument gives **reliable** results when the same result is obtained by repeating the measurement under the same conditions.
- Reliable results are devoid of **accidental errors**.

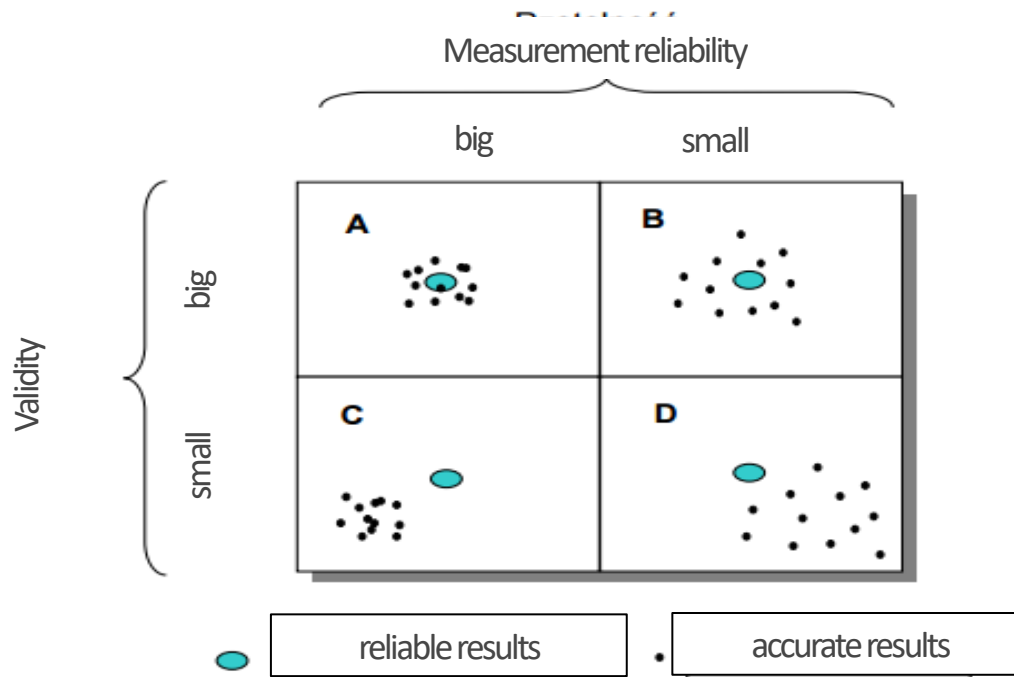


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- A** - accurate and reliable measurements; the study results will be consistent with the goals of the research.
- B** - accurate but not reliable measurements; the results do not guarantee achieving the aim of the research.
- C** - reliable but not accurate measurement; the result of such measurements does not always annul the goal.
- D** - not reliable and not accurate measurements; the result of the measurements is completely useless from the point of view of the aim of the research.