

Tools and Techniques of Research

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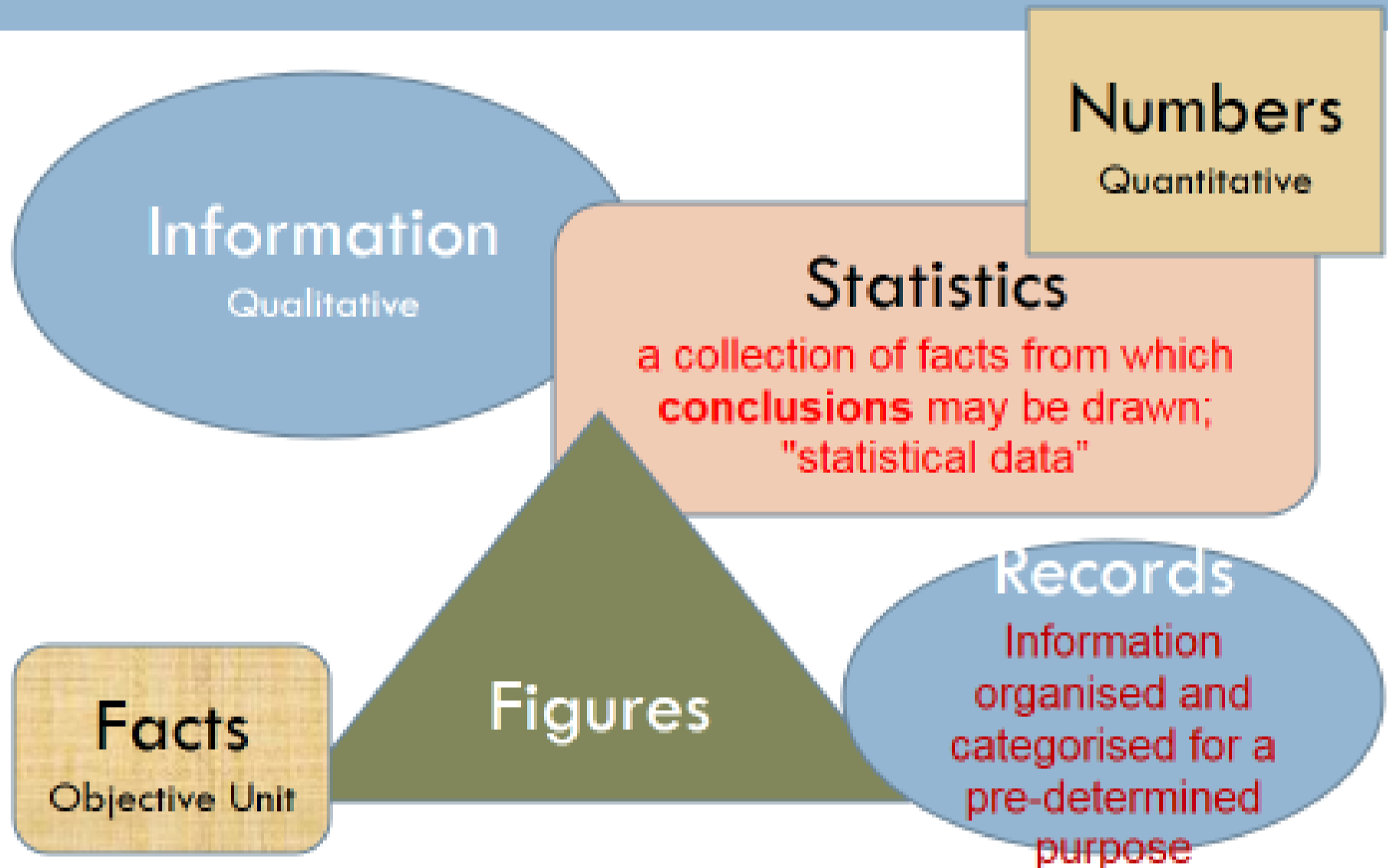
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Introduction



What is DATA?

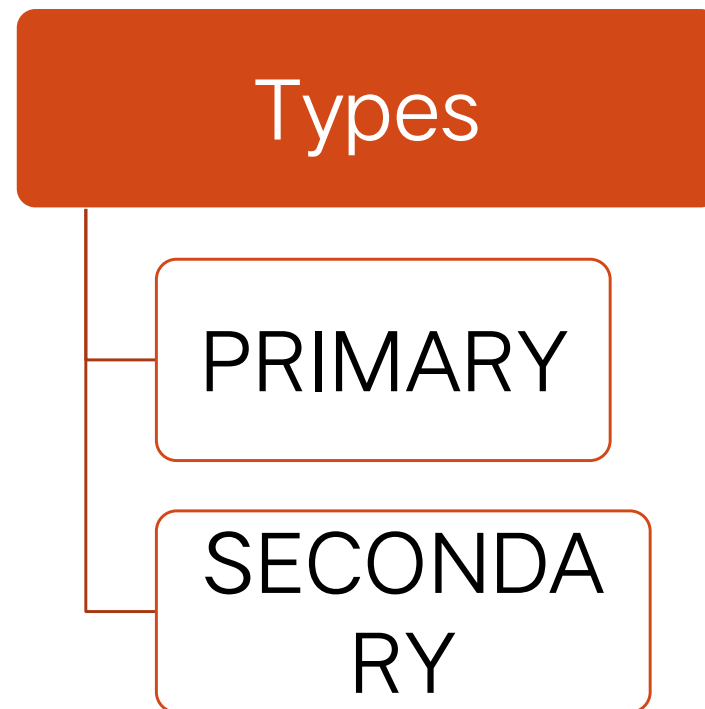


Data Sources

- People: program managers ,administrators, beneficiaries, donors, program staff, government officials, etc.
- Documents: program strategy, annual plans, progress reports, financial reports,
- Infrastructure observation: building and grounds, laboratories, program sites,
- Observation of group dynamics: nature of meetings, Board meetings, etc.

Data : facts or statistics for reference or analysis

The quality of data can be expressed in terms of its representative features of the reality which can be insured by the usage of a fitting data collection method. There are two modes of collecting data



Types of Data

PRIMARY

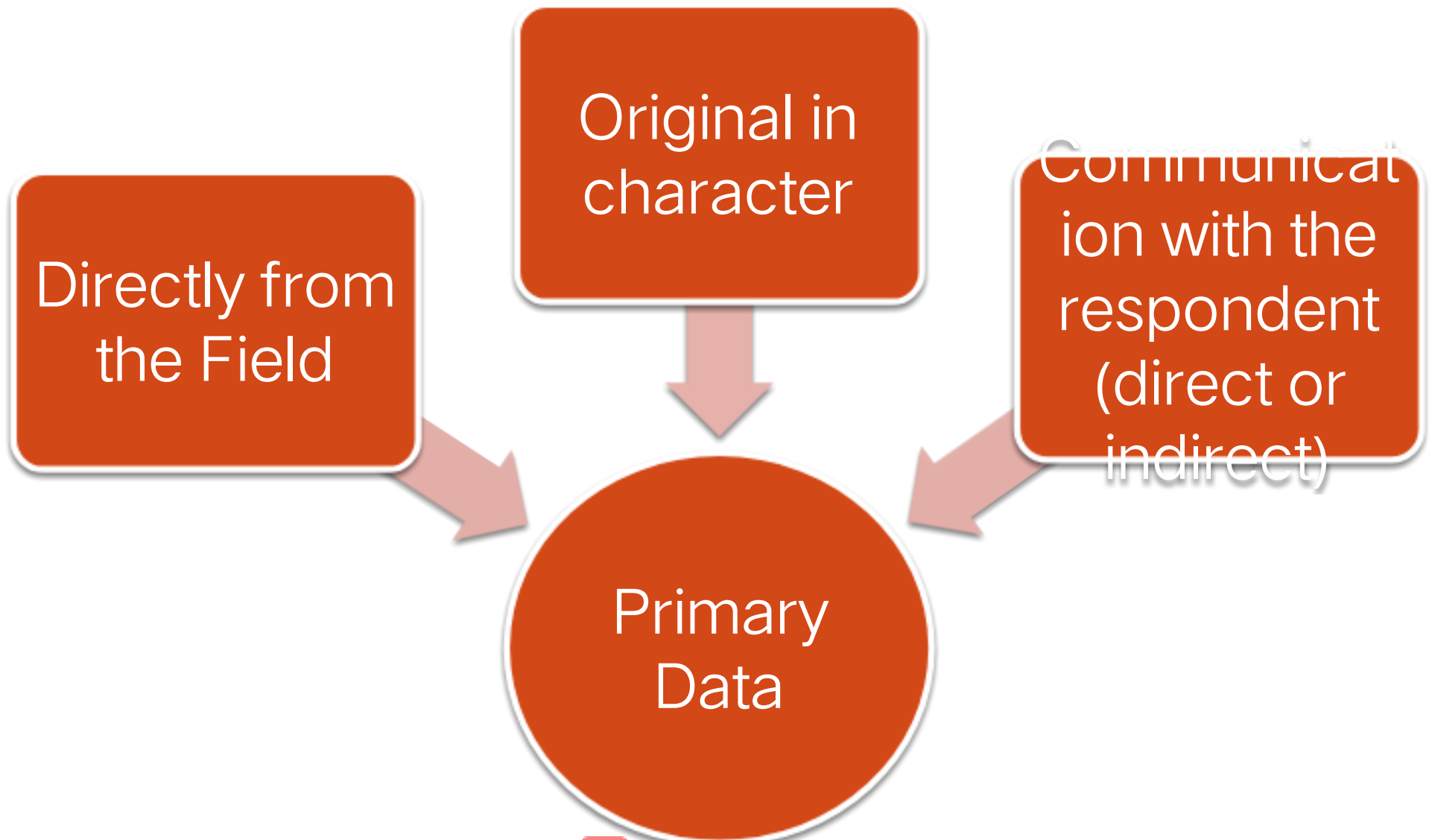
- Collected by researcher first hand
- Demands efforts and resources
- Depends upon the researcher's ability and clarity of purpose

SECONDARY

- ❖ Collected by someone else but used by researcher second hand
- ❖ Cheaper and quicker
- ❖ Needs lesser resources
- ❖ Have to ascertain accuracy of content/ time/sources/ purpose/ methods/ adequacy/ credibility
- ❖ Various sources/forms

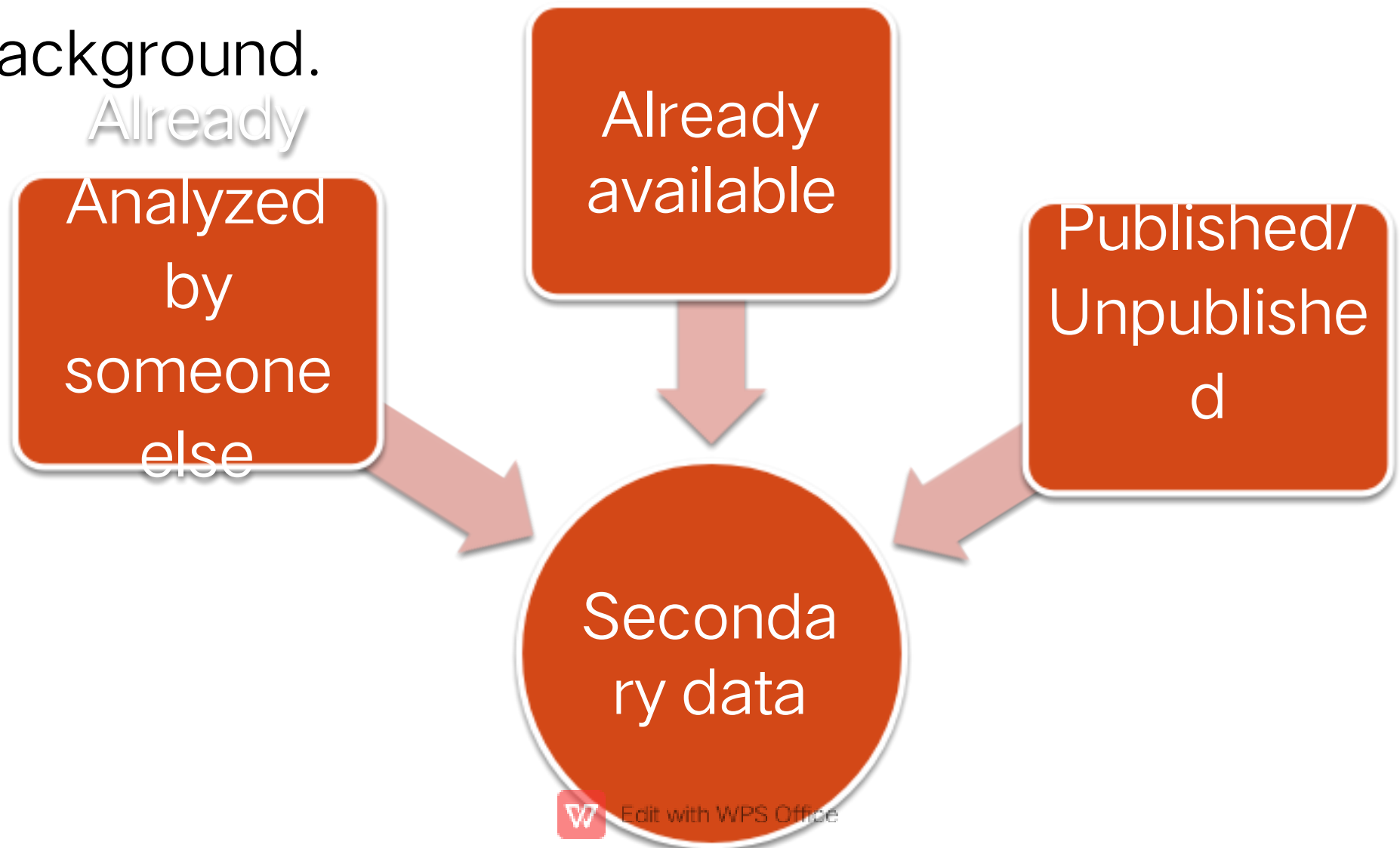


Types:

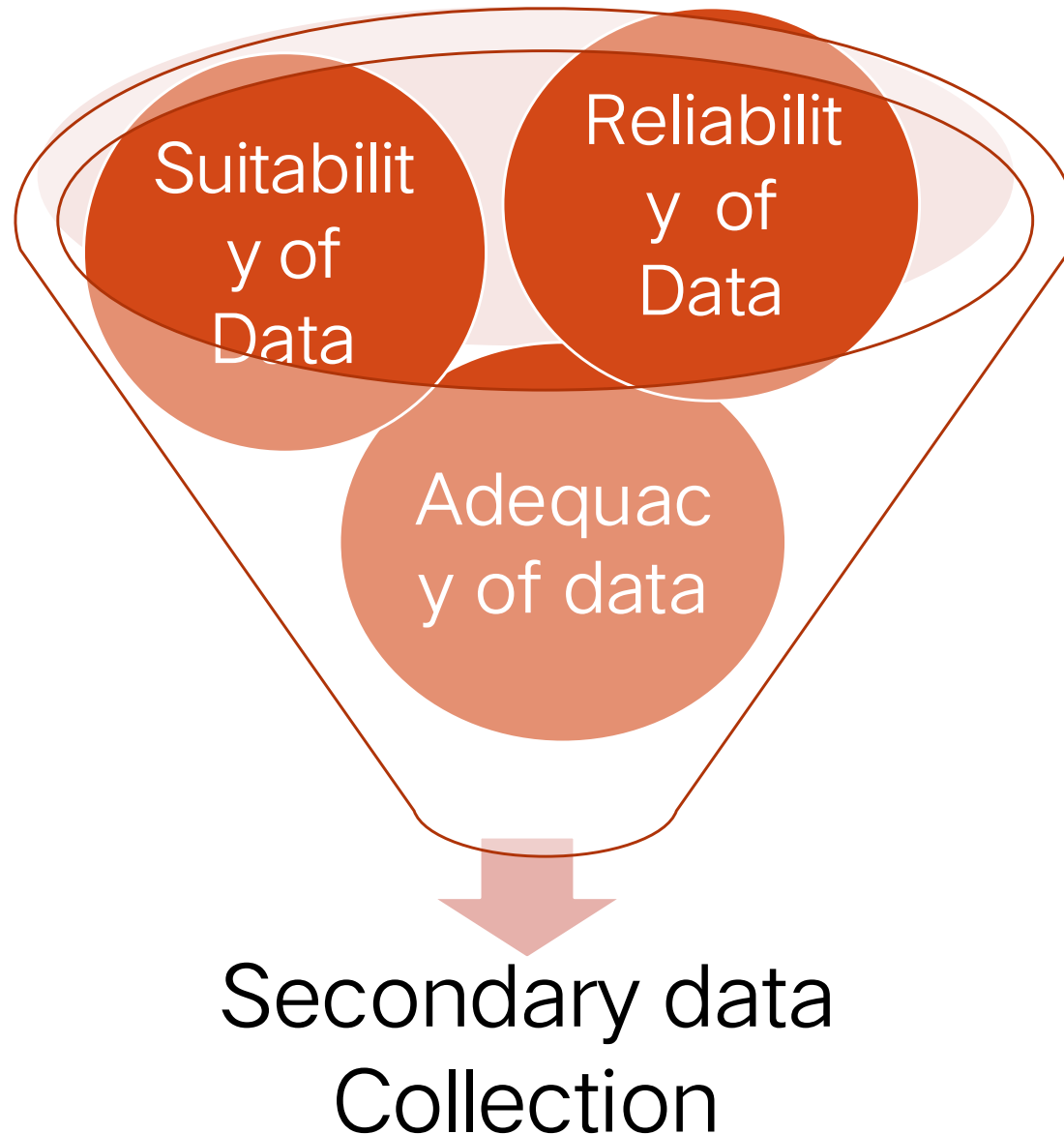


Types:

An inexpensive, initial inquiry that provides necessary contextual background.



Things to keep in mind...



What is research tool?

- Research tool can be defined as the instrument in the hands of researchers to measure what they intend to in their study.
- An instrument may be a test, questionnaire, observation checklist or interview schedule or survey.
- An instrument is a tool for measuring, observing or documenting quantitative and qualitative data.
- Universities and public research institutions have many resources that can be considered research tools.

Reference:[http://www.answers.com/Q/
What_is_the_definition_of_research_tool](http://www.answers.com/Q/What_is_the_definition_of_research_tool)



Means of collecting Primary Data

Methods :

- Observation Method
- Interview Method
- Case study Method
- Ethnographic study

Tools for Data collection:

- Through different Questionnaires
- Rating scales
- Check list
- Survey Method
- Focus group Discussion
- Schedules (interview or guidelines)



Data collection tools & techniques

TOOLS

- Questionnaire
- Interview schedule
- Observation schedule
- Scales
- Tests
- Inventory, Checklist, Opinionnaire
- Sociogram/ Sociometry

TEHNIQUES

- Questioning: Written, Oral
- Interviewing: Face to face, Telephonic, Electronic/Net, Group, Video
- Observation
- Projective Techniques
- Panel Methods (Diary, Checklist, Logs etc.)



Quantitative Research Tools

- Questionnaire
- Interview Schedule
- Observation Schedule
- Scaling



Questionnaire

- Questionnaires is a set of questions on a form used to collect data from large numbers of people i.e. the same information is collected in the same way.
- Questionnaire vary in length and complexity.



Item construction

- Item should be directly related to the research problem or hypothesis.
- Items are to be clear and unambiguous.
- Use terminology that respondents will understand.
- Avoid vague words, technical terms and jargons.
- Include only one concept in a single item.
- Avoid the use of leading questions (these are questions with implicit assumptions or anticipated outcomes).



Item construction

- Avoid questions loaded with social and professional desirability.
- Avoid questions that demands personal or delicate information.
- Request only information that respondents able to provide.
- Shorter or simpler items are preferred to longer or complex items.



Questionnaires can be:

- Filled in by the participant.
- Postal questionnaire
- Telephone questionnaire
- Email questionnaire/ web-based questionnaire (survey monkey)
- Administration of a questionnaire to a group.

<http://libweb.surrey.ac.uk/library/skills/Introduction%20to%20Research%20and%20Managing%20Information%20Leicester/index.htm>



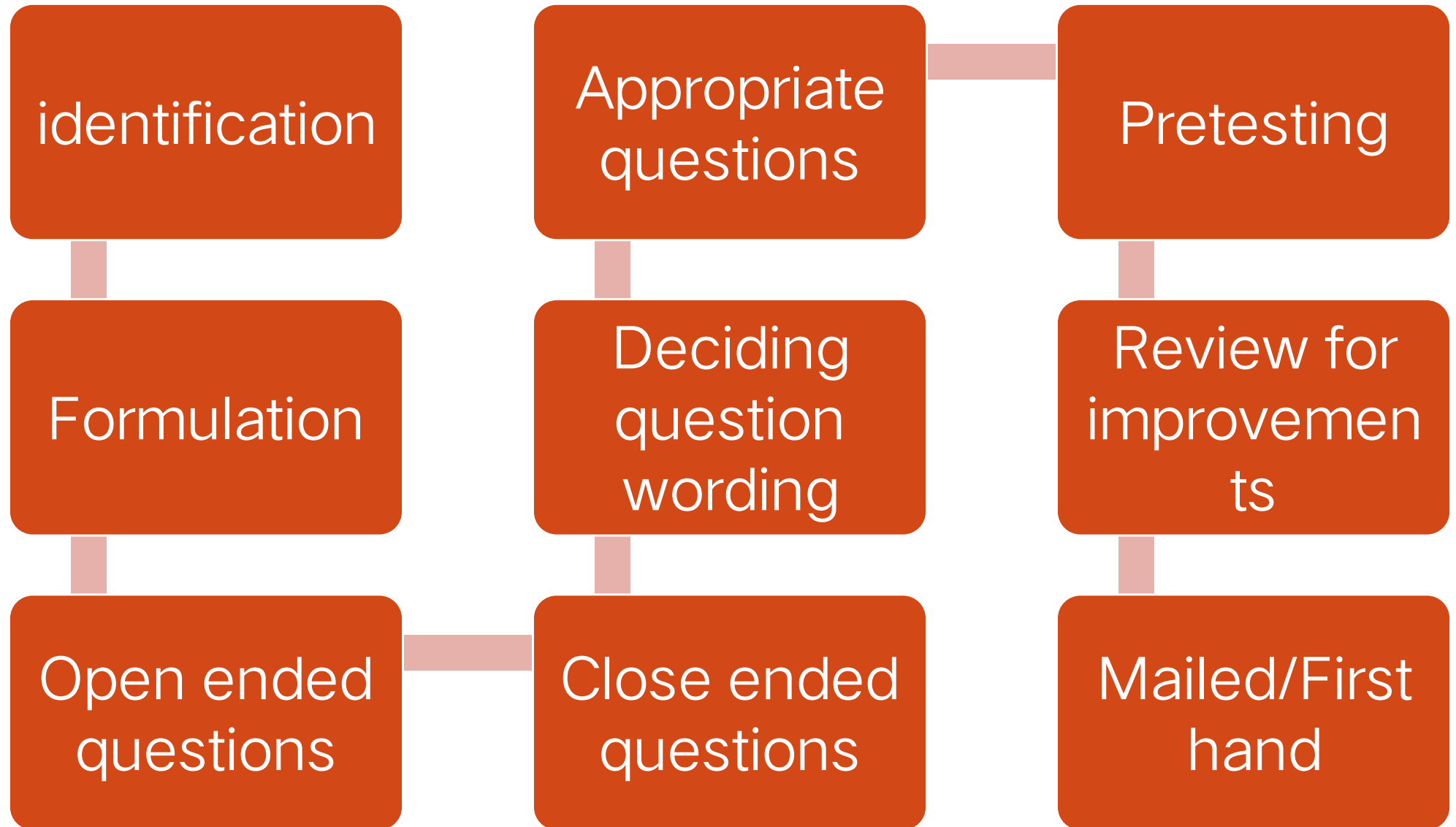
Through Questionnaire

A questionnaire consists of a set of well formulated question to probe an obtained responses from the respondents

- Set of formulated questions
- Big inquires
- Printed or Typed
- Questions in set or order
- Heart of the survey
- Careful construction



Steps in designing a questionnaire



Essentials of a Questionnaire

Short and simple

Logical sequence

Personal and intermediate questions should be left till the end

Avoid technical terms and vague expression

Questions may be : dichotomous, OE or CE

Questions affecting the sentiments should be avoided

Adequate space should be provided

There should always be provision for indication of uncertainty

Appearance of the questionnaire : should be attractive



Attendee's Questionnaire

1. How many of your family members are vegetarian? _____ Vegan? _____
2. Any other food issues we should take into account? (allergies, no red meat, etc.) _____

3. How many of your family members like each of the following beverages:

Coke _____ Diet Coke _____ Red Bull _____ Mountain Dew _____

Juice _____ Gatorade _____ Iced Tea _____ Sprite _____

Other (specify) _____

4. How many of your family members like each of the following snack categories:

Salty _____ Sweet _____ Cheesy _____ Bland _____

5. How many of your family members like each of the following foods:

Apples _____ Oranges _____ Trail Mix _____ Energy Bars _____

6. Here in the desert, we respect the native wildlife. Please let us know which member of your family will be associated with each of the following desert dwellers. No doubling up--if you have fewer than six family members, leave one or two blank.

- a. The Cactus is adept at finding and storing liquids. _____
- b. The Coyote is a trickster, never to be trusted. _____
- c. The Jackrabbit is swift and nimble-footed _____
- d. The Rattlesnake projects its venom straight and far. _____
- e. The Road Runner escapes capture with quick wits. _____
- f. The Scorpion whips its tail with speed and accuracy. _____

Please send your completed Attendee's Questionnaire to this address:
SOAA, 1820 Remembrance Hill St., Las Vegas, NV 89144-5420. Alternately, you can email the completed Attendee's Questionnaire to SOAA-Properties@excite.com or fax it to us at 413-826-0148. We need them by April 12th, so don't delay! Don't forget about the driver information, which can be included with the AQ if you mail it or fax it.

Interview

An ***interview*** is a conversation between two people where questions are asked by the interviewer to elicit facts or statements from the interviewee.

Steps involved:

- Training individual interviewer.
- Access to participants.
- The pace of interview is set to be comfortable.
- Ask open ended questions and interviewer write down the answers of respondents (or tape records them).
- The interviewer may also record any personal feeling about the interview.



Interview cont.....

1. **One to one interviews** are useful for asking sensitive questions.
 - Provide comments that go beyond the initial questions.
 - Interviews lead to high response rate because participants obliged to complete the interview.
 - They also allow the researcher to clarify ambiguous answers and when appropriate, seek follow-up information.
 - Researcher may also prejudice respondents answers knowingly or unknowingly through either comments or body language.
 - Not all interviewees are comfortable in disclosing the information.



2. Telephone interviews

- less time consuming
- less expensive
- researcher has ready access to anyone who has a telephone.
- response rate is not as high as the face-to-face interview but considerably higher than the mailed questionnaire.



Computer Assisted Personal Interviewing (CAPI)

- It is a form of personal interviewing.
- The interviewer brings a laptop
- hand-held computer to enter the information directly into the database.
- This method saves time involved in processing the data.
- this type of data collection method can be expensive to set up and requires that interviewers have computer and typing skills.

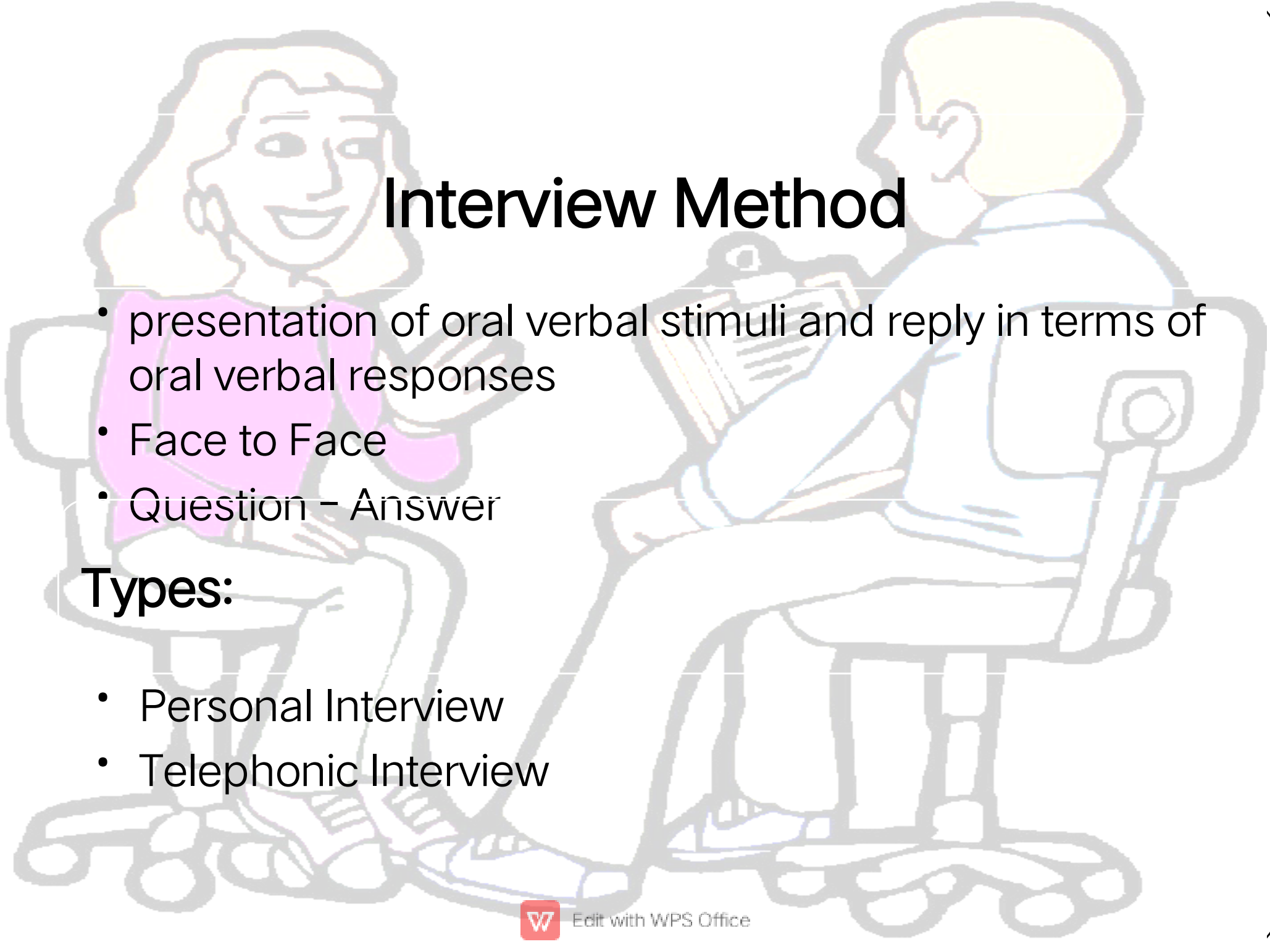
(<http://www.stat.ncsu.edu/info/srms/survpamphlet.html>)



Observation schedule

- This method implies the collection information by the way of investigation own research observations, without interviewing the respondents.
- There is a defined purpose to the observation.
- The information obtained through observations related to current situation i.e. current behavior or current events.
- Observations typically happen in naturalistic setting.
- It is not affected by past or future behavior.



A stylized illustration of an interview. On the left, a woman with blonde hair, wearing a pink top and white pants, sits in a white office chair, smiling and gesturing with her hands. On the right, a man with blonde hair, wearing a light blue shirt and white pants, sits in a white office chair, holding a clipboard and looking towards the woman. The background is white with a faint grey border.

Interview Method

- presentation of oral verbal stimuli and reply in terms of oral verbal responses
- Face to Face
- Question – Answer

Types:

- Personal Interview
- Telephonic Interview



Personal Interview

@Face to face
@Direct personal Investigation
@Indirect oral investigation

Structured Interview

- Pre-Determined Questions
- Use of standardized techniques
- Rigid Procedure

Unstructured Interview

- Flexible approach/ Greater Freedom
- Requires deep knowledge & skill
- Pitfall: Analysis of responses is difficult
- Attention on the specific

Focus Interview

- Greater freedom
- Used in generating hypothesis



Contd..

Clinical Interview

- motivation/feelings during the course of life
- Psychiatric clinics, prison administration etc
- E.G – Freud's work comprised of

Non-Directive Interview

- Encourage the respondent to talk
- Interviewer acts as a catalyst



Contd..

Telephonic Interview:

- ❖ Information through Phone.
- ❖ Time of the call
- ❖ Interviewer records: Name, Number, Call date, Duration and any special remark.
- ❖ Done for Industrial Purposes

- Cheaper
- Easy Recall
- Higher Rate of response
- No field staff
- Requirements explained easily
- For large Sample size
- Embarrass

- Little time to answer
- Restricted : telephonic facilities
 - Cost consideration: No extensive coverage
 - Lack of genuineness
 - Probes difficult to

Primary Data

Observation Method

- It's a scientific tool for the researcher
- Seeing things with purpose
- Planned systematically
- Collecting Facts
- Only relevant things into account



How to assess ?

Observation

1. Wide angle – e.g. whole class
2. Close-up – e.g. focusing on one child or activity
3. Non-participant observation – without
4. Participant observation – within



Essential Components for Observation

- Sensation: derived from sense organs, the accuracy of observation depends to great extent on power of sensory organs.
- Attention: ability to concentrate
- Perception: enables the mind to recognize the facts by identifying sensations and drawing upon experience and introspection.



Types of observation

Structured –
Unstructured
observation

Participant and
Non participant

Controlled and
uncontrolled
observation



Contd..

Structured Observation

Develop a
Specific Plan
Defines the
units to be
observed
Standardized
conditions
Researcher
gets Prepared

Unstructured Observation

No
standardized
Conditions

No set of pre
determined
objectives

Not thought in
advance



Contd..

Participant Observation

Researcher becomes a member of the group.
Natural

behaviour of the group, gathering the information is easy, Gets the truth.

Demerit:

Researcher may lose objectivity

Non-Participant Observation

Observation as a detached emissary

Observation done without making his presence felt:
disguised observation.



Contd..

Controlled Observation

Pre-arranged plan & involves experimental procedure

Mechanical Instruments are used
Takes place in laboratory or under controlled conditions

Supply formalized data

Uncontrolled Observation

Natural Settings
Allows spontaneous picture of life

Pitfall: Subjective interpretation



Case Study

- # Quantitative Analysis
- # Careful and complete Observation
- # Depth Study
- # Intensive investigation
- # Analysis of events, conditions & their interrelations
- # Generalizations & inferences are drawn



Hartfield (1982) has referred to following distinguishing **characteristics** of case study :

- ❑ It studies whole unit in totality and not some selected aspects or variables of these units.
- ❑ It employs several methods in data collection to prevent errors and distortions.
- ❑ It often studies a single unit: 1 unit is 1 study.
- ❑ It perceives the respondent as a knowledgeable person, not just as a source of data.
- ❑ It studies a typical case.



Principles of case Study:

Use of Multiple Sources

Maintaining a chain of evidence

Evidence should be Preserved

Record data



In depth
study of
culture or
subculture

Ethnography

participant
observation
of a culture
or distinct
social group;
by making
extensive
field notes

It seeks to describe the
pattern of relationship,
customs, beliefs, technology,
art, and tradition that make
up a society's way of life.

Instead of understanding a
single individual , it is directed
at understanding a culture or
a distinct social group



❑ To use Ethnographic studies as a tool, researcher should :

- Lived for a much more extensive period of time among the tribe and became an integrated member of the social group.
- Learned the native language, enabling him or her to develop the sensitivity to think, feel, and interpret observations in terms of the tribe's concepts, feelings, and values while at the same time supplementing his or her own objective judgment in interpreting observations.
- Trained his or her informants to systematically record field data in their own language and cultural perspective



Use:

Ethnographic research has broad implications for many fields, including education.

Professional development evaluators and staff developers can use this approach to understand teachers' needs, experiences, viewpoints, and goals.

Such information can enable them to design useful and worthwhile programs for teachers and ultimately improve student learning



Checklist

It is a list of items which have to be checked/ticked/crossed

- The presence or absence of behaviour may be indicated by checking yes or no or the type or number of items may be indicated by inserting the appropriate word or number.



- The simplest of the devices, is a prepared list of behaviors or items.
- It can be supplementary to other tools as is not enough by itself
- It acts as a guide for the researcher
- E.g. Laundry list or standardized check list for use on people, processes/methods &

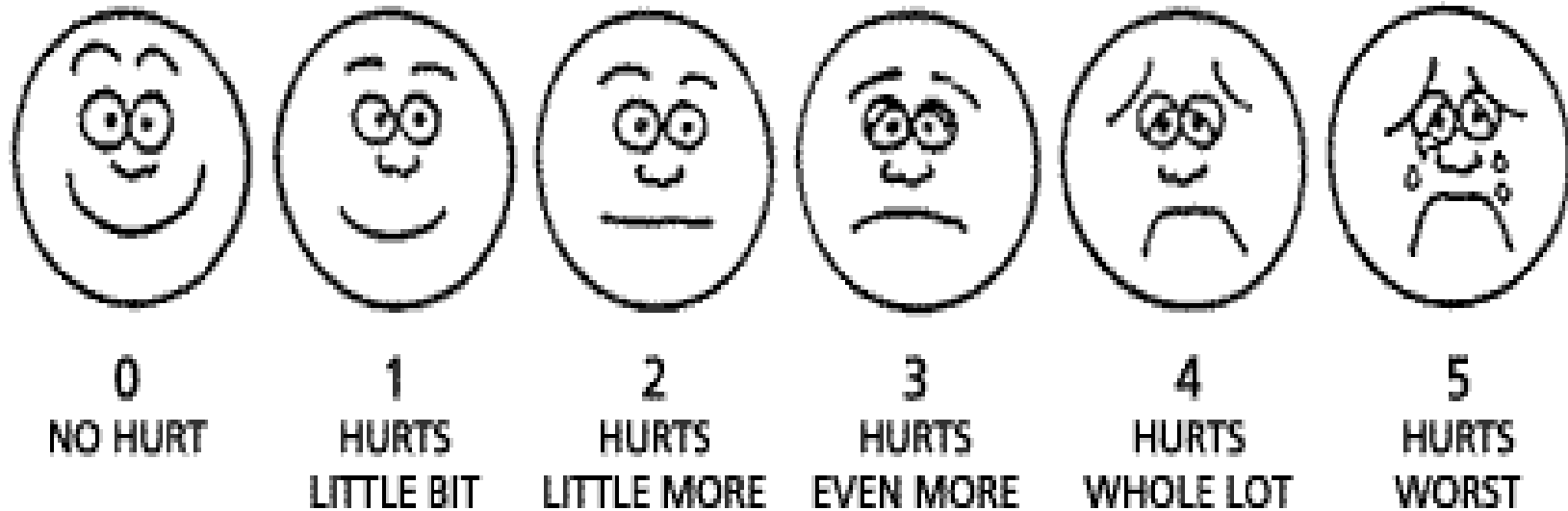


Rating Scale

- The rating scales involve qualitative description of a limited number of aspects of a thing or of traits of a person
- we judge an object in absolute terms against some specified criteria. These ratings may be in such forms as like-dislike, above-average-average and below average and so

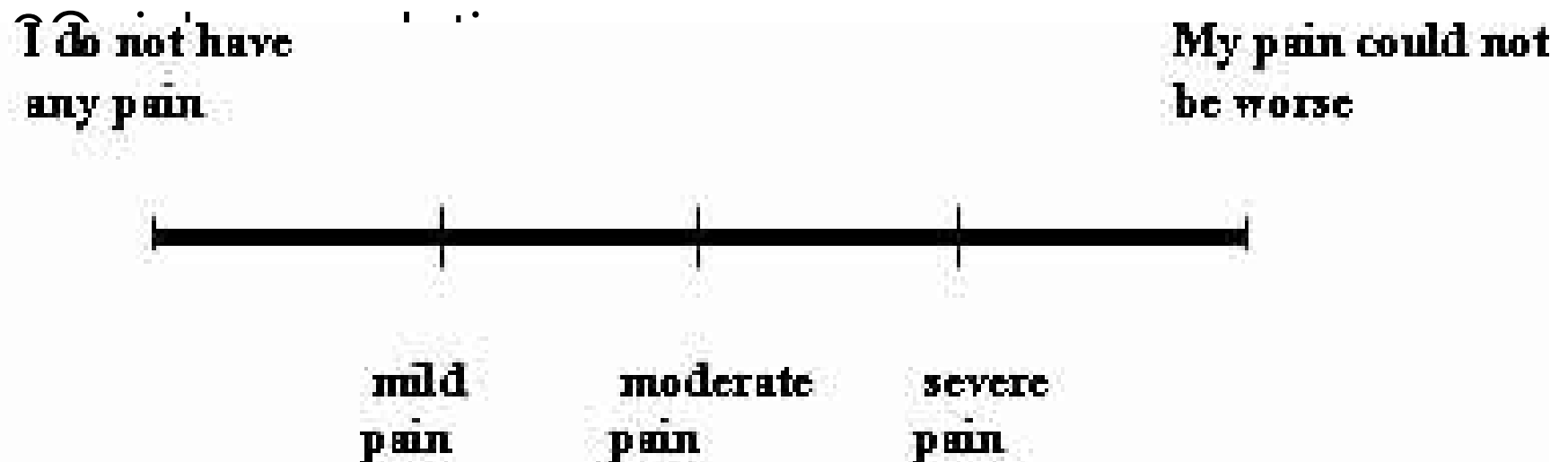
Numerical scale:

- Rater is supplied with a sequence of defined numbers.
- Investigator assigns numerical to certain categories



Graphic Rating Scale:

- Scales presented graphically in which descriptive areas corresponding to different items are given.
- Rater simply puts a tick mark on any descriptive areas.
- Most popular, considered as an improvement over numerical scale



Percentage rating:

- Rater places among different specified percentage groups, different percentiles or quartiles.

- Common among teachers

E.g : Highest 5%

Highest 25% excluding top 10%

Top half but not the top 25%

Or top 2% of engineering students get selected for IIT

Standard scale :

- Task is to compare, rater is asked to give the name of person who is well known to him & who is very high on the trait being rated.

- Eg:

<u>Scale values</u>	<u>Names</u>
---------------------	--------------

Very high	Lt. chima
-----------	-----------

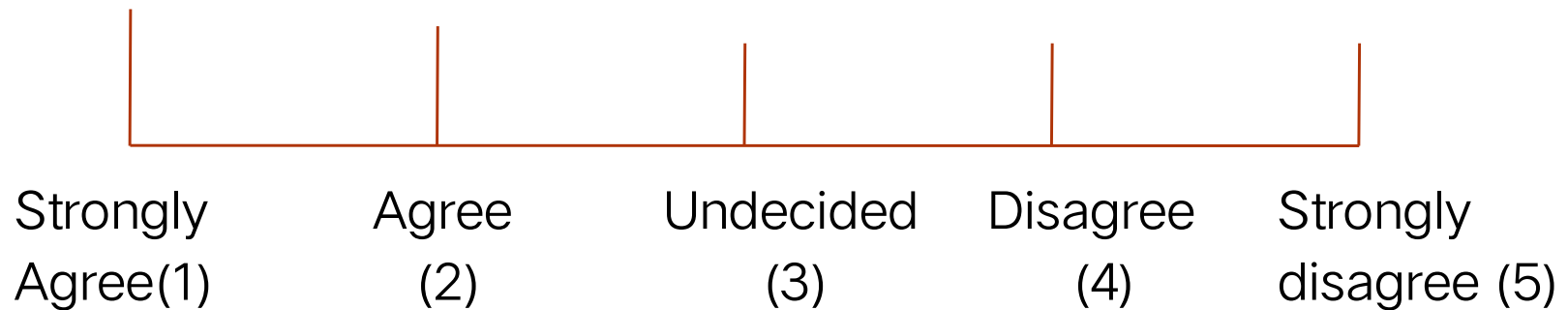
High	Col. Shamsheer
------	----------------

Average	Brig karpa
---------	------------



Likert scale:

Such scales consist of a number of statements which express either a favorable or unfavorable attitude towards the given object to which the respondent is asked to react. Below are five points constitute the scale. Each point carries a score



Qualitative Research Tools

- Focused Group Interviews
- In-Depth Interviews
- Observation
- Content Analysis
- Triangulation
- Case study



Focused Group Interviews

Focused group interview:

- Shared understanding from several individuals.
- A focus group is a moderated discussion with a group of participants.
- The size of the group depends on the target population.
- While focus groups have historically been held in person (face-to-face).
- virtually using teleconferencing, web-conferencing, or online collaboration tools.



Steps involved:

- Encourage all participants to talk.
- Turn taking
- Audio taped then transcribed



In-Depth Interviews

- These are a guided and open-ended discussion with a single respondent.
- Interviewers lead respondents through a structured topic guide that addresses key issues of interest.
- These are appropriate for :
 1. executives,
 2. geographically dispersed groups
 3. people who would not feel comfortable speaking openly in a group.



Content Analysis

It is a research tool for systematic classification process of coding and identifying themes or patterns.

Step 1: Prepare the Data

Step 2: Define the Unit of Analysis

Step 3: Develop Categories and a Coding Scheme

Step 4: Test Your Coding Scheme on a Sample of Text

Step 5: Code All the Text

Step 6: Assess Your Coding Consistency

Step 7: Draw Conclusions from the Coded Data

Step 8: Report Your Methods and Findings

Hsieh, H.-F., & Shannon, S.E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research*, 15(9), 1277-1288.

https://www.ischool.utexas.edu/~yanz/Content_analysis.pdf



Triangulation

Multiple data collection
strategies

(may interview & observe students)

Kinds of data

Multiple
kinds of
data

Subjects
(data sources)

Data collection
strategies

Multiple data
sources

(may

interview

teachers, parents,

(may review student
records, interview



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Projective techniques of research (TAT, CAT)

- The projective techniques include several tests given to the respondents. They may be asked to give their comments on cartoons, pictures, stories etc. The stimuli used for this purpose are capable of answering the respondent to a variety of reactions. A number of Projective Techniques, are available to the researchers for the purpose of analysing “why” part of consumer behaviour.

<http://www.yourarticlelibrary.com/marketing/marketing-research/motivation-research-techniques-uses-and-limitation-of-motivation-research/29995/>



The main Projective Techniques are as follows:

1. Word Association Test (W.A.I):

- The interviewer calls a series of listed words one by one and the respondents quickly replies the first word that enters his mind. The underlying assumption is that by “free associating” with certain stimuli (words) the responses are timed so that those answers which the respondent “response out” are identified.



2. Sentence Completion:

- Sentence completion test is similar to word association test except that the respondent is required to complete an unfinished sentence.
- For example, “I do not use shampoos because.....”
- “Coffee that is quickly made.....”



3. Story Completion:

- In this technique the respondent is asked to complete a story, end of which is missing. This enables a researcher to find out the almost exact version of images and feelings of people towards a company's product. This helps in finalising the advertising and promotional themes for the product in question.



4. Research of Ink-blot Tests (or Research Tests):

- Motivation Research employs this famous test. These tests are not in much use in marketing research. The research test expresses in a classic way the rationale behind all projective tests, that is, in filling the missing parts of a vague and incomplete stimulus, the respondent projects himself and his personality into the picture.
- A lot of ink is put on the piece of paper and reference is made of company, product, and the respondent is asked to give his view points after interpreting what he sees in the blot before him. The respondent say, “ugly packaging of the product”, or “excellent performance of the product”. This response will help the seller to finalize his marketing strategies.



5. Psychographic Technique:

- This includes galvanic skin response, eye movement and eye blink test etc. which uses various Instruments with the physiological responses.



6. Espionage Technique:

- There are two methods in this technique:

(i) Use of Hidden Recorders:

- Such as hidden tape recorders, cameras used to watch consumers as they make purchases or consume items.



Thank you...



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