SCIENTIFIC METHODOLOGY

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WHAT IS SCIENTIFIC METHOD?

An effort to *accurately* (validity) and *precisely* (reliability) represent/reflect (measure) phenomena experienced

WHY IS THIS NECESSARY?

HUMAN BEINGS' DESIRE TO MAKE SENSE OF IMPRINTS ON THEIR SENSES

- Touch
- Hearing
- Sight
- Smell
- Taste

JUST SENSING OR INTIUTION IS NOT SUFFICIENT FOR HUMANS

THIS ARISES FROM HUMAN CAPABILITY TO THINK/REFLECT AT HIGHER LEVELS OF ABSTRACTION THAN OTHER EARTHLINGS

e.g., Freedom, Democracy, Love, Happiness
Concepts beyond immediate sensory detection
[concrete vs. abstract]

WE ARE, THEREFORE, SYMBOLIC BEINGS

THE SYMBOLIC IS THE SYSTEM OF IMAGES AND IMAGINARIES THROUGH WHICH HUMANS DETECT, RECOGNIZE, INTERPRET, DETERMINE, AND COMMUNICATE EXPERIENCES

(LANGUAGE IS A SYMBOLIC SYSTEM)

TO MAKE MORE AND MORE DISTINCT SENSE OF THINGS WE EXPERIENCE, HUMANS DESIRE BETTER AND BETTER SENSORY DETECTION

DESIRE TO DETECT MORE AND MORE MINUTE DISTINCTIONS (DIFFERENCES DETECTED)

HOW DO WE DETECT PHENOMENA?

OBSERVE/RECORD DIRECT IMPRINTS ON SENSES
(e.g., 'HOT', 'SOFT')

or

CONSTRUCT MECHANISMS/INSTRUMENTS/MACHINES
(e.g., THERMOMETER, MICROSCOPE, QUESTIONNAIRE)

FOR THE MEASUREMENTS WE MAKE
NOT ONLY THE MEASUREMENT INSTRUMENT
BUT ALSO THE CONDITIONS THAT THE
MEASREMENTS ARE MADE UNDER MUST
ASSURE *ACCURATE* AND *PRECISE*
MEASURES TO BE TAKEN

METHODOLOGY IS CONCERNED WITH CONSIDERATIONS
REGARDING THE DESIGN OF AND REFLECTIONS UPON
THE INSTRUMENTS USED AND THE CONDITIONS
UNDER WHICH MEASURESMENTS ARE MADE

THERE ARE 3 BASIC PURPOSES THAT SCIENTIFIC METHODOLOGY IS PUT TO

- DESCRIPTION
- PREDICTION
- EXPLANATION

# OF PHENOMENA THAT ARE EXPERIENCED, OBSERVED, AND MEASURED

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SPECIFICALLY IN THE SOCIAL SCIENCES RESEARCH IS APPROACHED IN 2 MAJOR WAYS TO ACCOMPLISH MEASUREMENTS

- **QUANTITATIVE RESEARCH**
    - NUMERIC VALUES ARE COLLECTED/OBTAINED

- **QUALITATIVE RESEARCH**
    - TEXTS ARE COLLECTED/OBTAINED

THERE ARE 3 KEY DESIGN ORIENTATIONS

- **DESCRIPTIVE DESIGNS**
- **EXPERIMENTAL DESIGNS**

  WHICH ARE FRIENDLIER TO THE *QUANTITATIVE* APPROACH and TO *DESCRIPTION* AND *PREDICTION*

- **EXPLORATORY/INTERPRETIVE DESIGNS**

  WHICH ARE FRIENDLIER TO THE *QUALITATIVE* APPROACH and TO *EXPLANATION*

SURFACE DATA POINTS
DOMAIN OF QUANTITATIVE RESEARCH
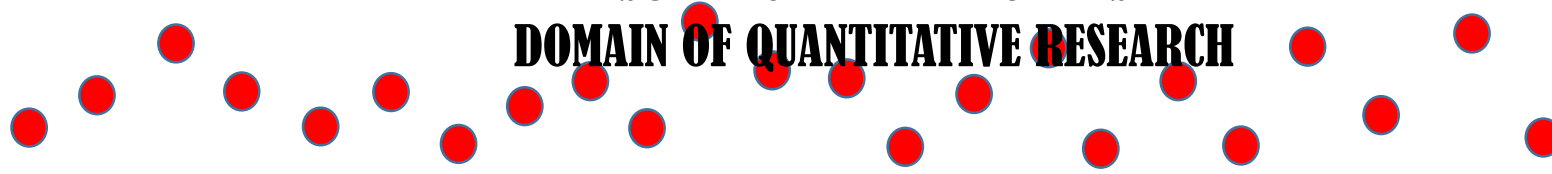
SURFACE

BELOW SURFACE PATTERNS
DOMAIN OF QUALITATIVE RESEARCH
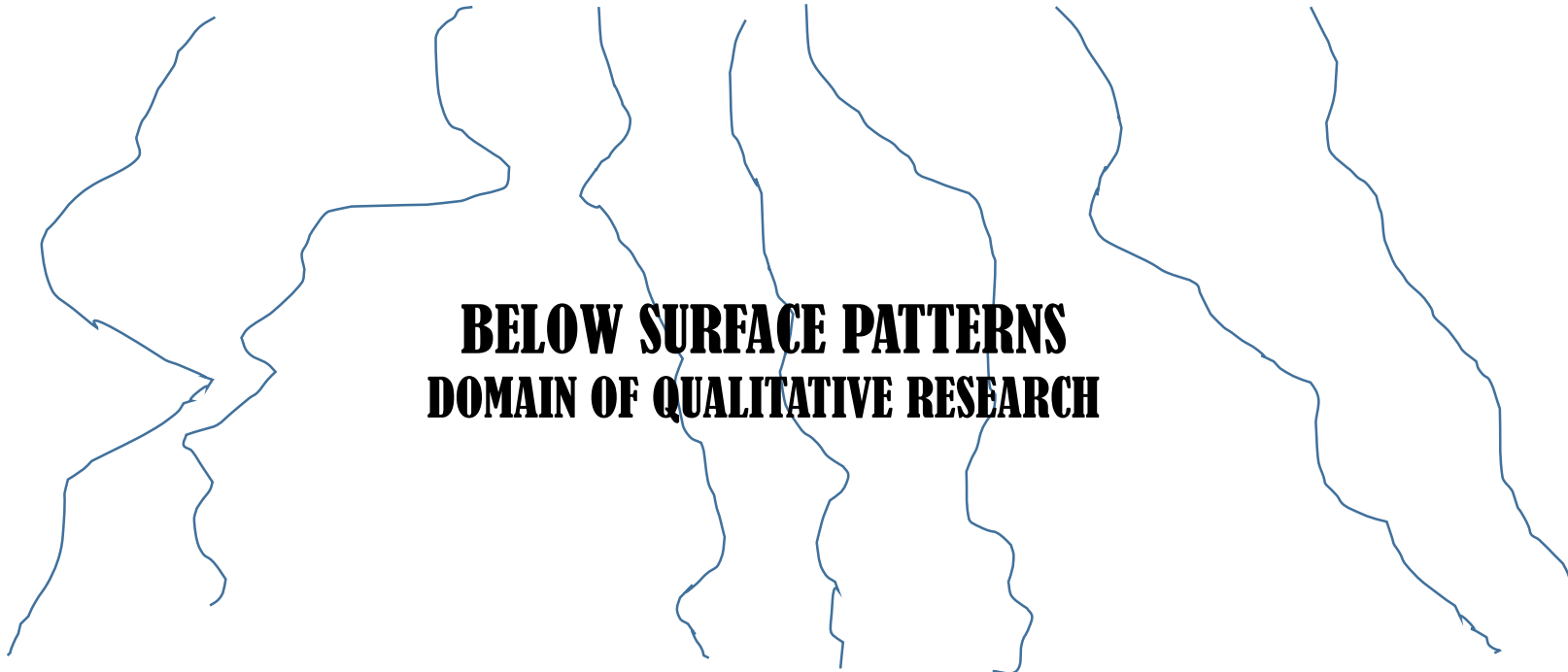
QUANTITATIVE DATA POINTS

5 TREES

28 DEGREES

LOW CONFLICT

FEMALE

QUALITATIVE TEXT

WHEN THE TEACHER PULLED HER EAR, THE STUDENT WAS VERY ANGRY

MEASURES

- ## NUMERIC
    - INTERVAL (e.g., FAHRENHEIT/CELCIUS DEGREES)
    - RATIO (e.g., NUMBER OF CHAIRS IN A ROOM)

- ## CATEGORICAL
    - ORDINAL (e.g., DEGREE OF CONFLICT)
    - NOMINAL (e.g., GENDER)

DESIGNS

- **DESCRIPTIVE DESIGNS**
    - SURVEY (ONE-TIME, CROSS-SECTIONAL)
    - PANEL (LONGITUDINAL)

- **EXPERIMENTAL DESIGNS**
    - BEFORE AND AFTER – VARIATIONS OF
    - AFTER ONLY – VARIATIONS OF

THREATS TO VALIDITY IN EXPERIMENTS

THREATS TO INTERNAL VALIDITY

- HISTORY
- MATURATION
- STATISTICAL REGRESSION
- INSTRUMENTATION
- TESTING
- MORTALITY
- SAMPLE SELECTION
- INTERACTION

THREATS TO EXTERNAL VALIDITY

- POPULATION SELECTION
- SETTING
- TIMING

QUALITATIVE RESEARCH

QUALITATIVE RESEARCH LARGELY USES METHODS OF ETHNOGRAPHY TO COLLECT TEXTS THAT CAN THEN BE ANALYZED

TEXT IS A SET OF SIGNS THAT MAKE SENSE AND CAN BE CONSTITUTED OF ALL KINDS OF SIGNS THAT IMPRINT ON HUMAN SENSES (HEARING, TASTE, TOUCH, SMELL, SIGHT)

ALL TEXT OCCURS WITHIN A CONTEXT, WHICH IS A LARGER TEXT WITHIN WHICH TEXTS EXIST

METHODS OF ETHNOGRAPHY MOST OFTEN USED

- IN-DEPTH INTERVIEW

- OBSERVATION

- PARTICIPANT OBSERVATION

THERE ARE 3 TYPES OF SIGNS

- **INDEX** – A SIGN THAT HAS A NATURAL LINK TO WHAT IT SIGNIFIES (e.g., SMOKE INDICATES THERE IS FIRE)
- **ICON** – A SIGN THAT RESEMBLES WHAT IT SIGNIFIES (e.g., 'SMILEY FACE' INDICATES A SMILE OR HAPPINESS)
- **SYMBOL** – A SIGN THAT IS CULTURALLY ARBITRARY (e.g., WHITE DOVE INDICATES PEACE)

QUALITATIVE ANALYSES HAVE TO RECOGNIZE THE TYPES OF SIGNS THAT CONSTITUTE THE TEXT TO EXTRACT MEANING

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THERE ARE SEVERAL METHODS AF ANALYZING TEXTS

- PHENOMENOLOGICAL ANALYSIS
- HERMENEUTIC ANALYSIS
- DISCOURSE ANALYSIS

I Shall briefly discuss two:

- SEMIOTIC ANALYSIS
- NARRATIVE YEXTUAL ANALYSIS

SEMIOTICS

- "A science that studies the life of signs within society."
  - Ferdinand de Saussure

- "The study of patterned human behaviour in communication in all its modes." & "The study of sign and symbol systems in general."
  - The Fontana Dictionary of Modern Thought

Level 1: Denotation

- **Picture (Image)**
- **Non verbal**
- **Non linear**
  - **Radiant**
- **Analogue**
  - **Combination of 2 symbols**
- **Many colors**
  - **Blue, violet, red, orange…**
- **Nature**

Acronym (Set of initials)

Verbal

Linear
  Superposed

Numeric / Digital
  Blue and white Stripes

One (two) colors
  Blue and white Stripes

Scripture

Level 2: Connotation

APPLE

Adam & Eve

The Tree of Knowledge

An Apple a day keeps the doctor away

A as in apple (alphabet)

An apple for the teacher

New York (The Big Apple - IBM)

Apple record (Beatles – The 60's)

RAINBOW

UNTIDY PRISM

Psychedelic

Broader consciousness

IBM - LINES

Convict costume

American flag

Where to sign on US official documents

Lines on paper

Buildings

Stocks

Level 3: Values

- **Intuition**
- **Conviviality**
- **Freedom**
- **Democracy**
- **Existential**
- **Utopian**
- **Individuality**
- **Creativity**

- **Rationality**
- **Efficiency**
- **Power**
- **Commitment**
- **Business**
- **Positivism**
- **Conformism**

Subjective

Level 4: Value-systems

Apple

- **Deep values**
  - Ideals
- **Identification with the user**
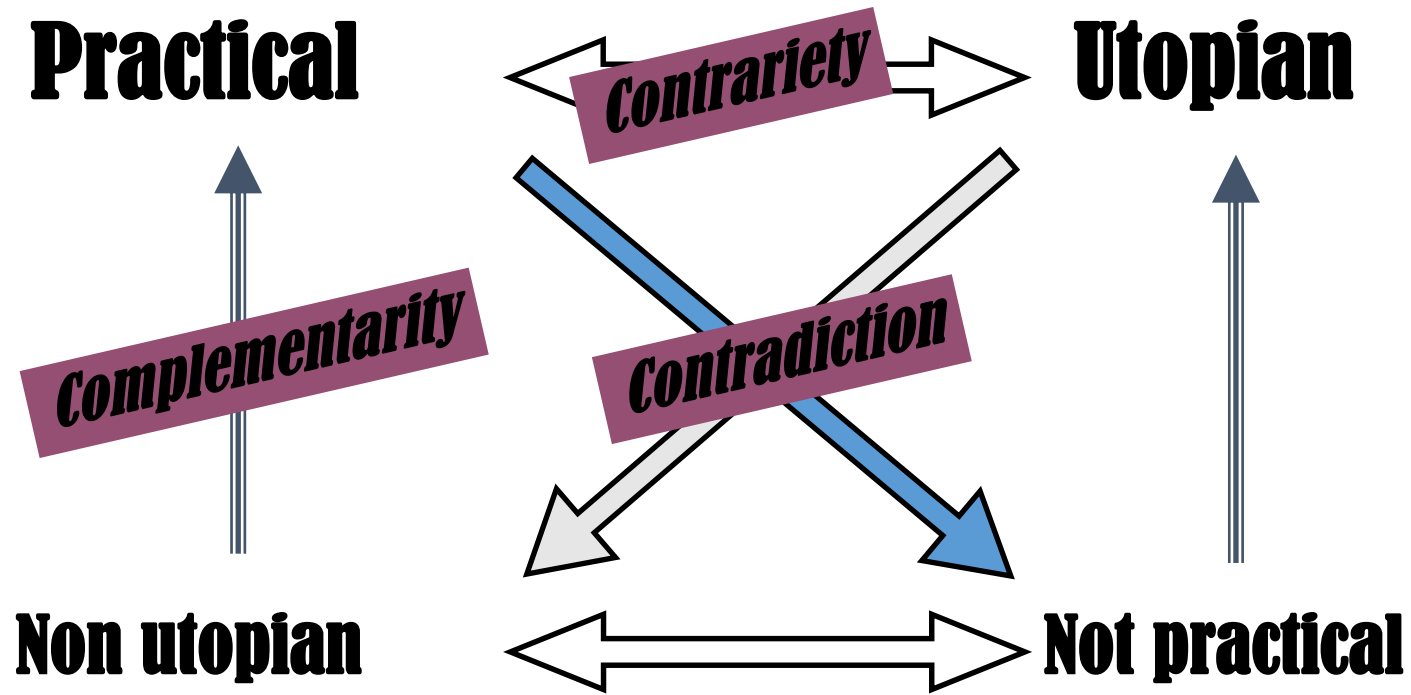 - Experience provider
  - Proximity

IBM

Utilitarian values
 – Materialistic

Service provider
 – Identication with the dealer
 – Distance

THE SEMIOTIC SQUARE

Practical

Contrariety

Utopian

Complementarity

Contradiction

Non utopian

Not practical

NARRATIVE TEXTUAL ANALYSIS

- ## DISCOVER MICRO-NARRATIVES
    - ### TURNING POINTS IN STORIES THAT REVEAL THE STORY

- ## IDENTIFY RECURRING MICRO-NARRATIVES TO COMBINE INTO MACRO-NARRATIVES

- ## CONTEXTUALIZE MACRO-NARRATIVE TO EXPLAIN A PHENOMENON