



Basics of Statistical Analyses

Upon the end of this session, you should be able to :

- understand how to input data into SPSS,
- undertake data purification,
- determine whether parametric or non-parametric analysis is appropriate, and
- undertake descriptive analysis



Quantitative & Qualitative Research

Quantitative Research - Generalisation a central aim

Purpose of Quantitative Research – to explain, predict and investigate relationships

Qualitative Research – less generalisation

Purpose of qualitative Research – to understand the experiences of participants, explore the topic in detail and gain indepth understanding of the topic.

Qualitative Research - Population, sampling (Convenience and Purposive)



Reliability and Validity

α

Reliability (Consistency)

- To measure the internal consistency of a scale or test
- Cronbach's Alpha is adopted to reflect the level of internal consistency.





Ensuring Validity in Qualitative Research

Qualitative Research – Researcher Subjectivity Concern

- Use a robust analysis and explain that clearly in your research.
- Share some conclusions with some interview participants to ensure that your conclusions do not deviate from their described experiences .
- When interviews were conducted in languages other than English, validity concerns must be addressed.

VALIDITY (Accuracy)

We do **Criterion Validity**

**Type of
validity**

Definition

Face

Does it make sense to use the measure for the construct?

Content

Does the measure sufficiently cover the phenomenon that it is intended to cover

Criterion

Does the measure (*predictor*) correctly predict an outcome (*criterion*)?

Construct Does the measure reflect the construct and is the measure related to other variables in predicted ways?

Criterion Validity

- Pearson's coefficient
- Critical values for Pearson's coefficient

Mixed Method Approach

- Pragmatism paradigm
- Justification of the suitability of pragmatism paradigm in the study
- Implementing the mixed methodology

Research Paradigms and Assumptions

Research Paradigms	Research Approach	Ontology	Axiology	Research Strategy
Positivism	Deductive	Objective	Value-free	Quantitative
Interpretivism	Inductive	Subjective	Biased	Qualitative
Pragmatism	Deductive + Inductive	Objective + Subjective	Value-free / biased	Quantitative and or Qualitative
Realism	Inductive or Deductive	Objective or Subjective	Biased	Qualitative or Quantitative

Source: Saunders et al, 2015; Wilson, 2010

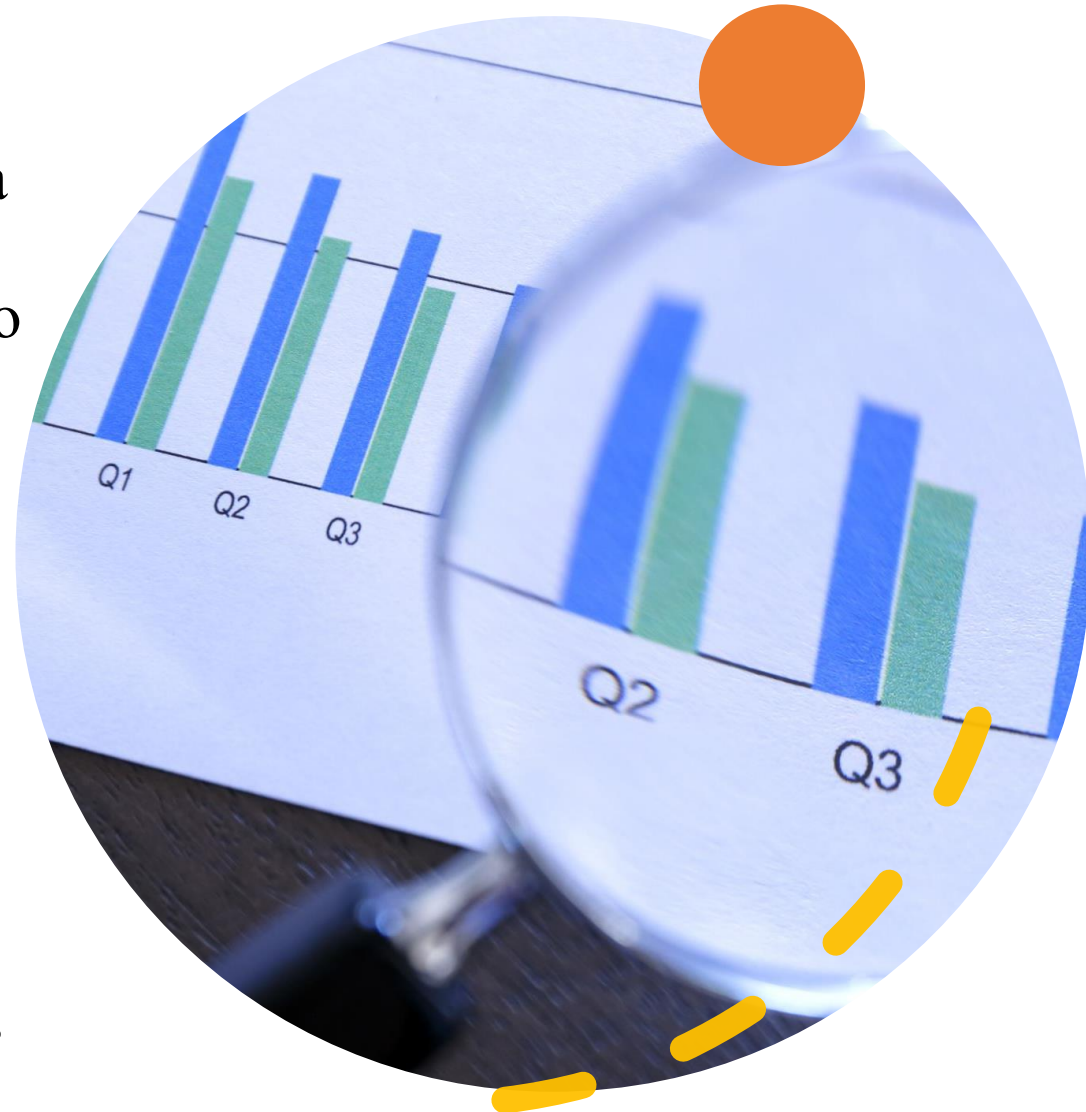
Mixed-Method Approach: Purpose

- Validating findings combining qualitative and quantitative data (Creswell & Clark, 2011).

For example, a researcher can collect qualitative data to understand the personal experiences of social media users while also utilising survey instruments to understand same. Thus, both qualitative and quantitative data can provide methodological validation for each other and solid foundation for drawing conclusions.

- Using qualitative data to explore quantitative findings (Johnson & Christensen, 2017)

Here, the implementation of the qualitative data collection tool is guided by the quantitative findings.



Implementing Mixed -Method

- Quant + Qual
- Combination: 50% to 50% or 75% to 25% (Steckler et al, 1992; Jick, 1979).
- Implementation: Concurrently or sequentially (Steckler, 1992; Creswell, 2003; Onwuegbuzie and Turner, 2007)

Q & A

- Interactive session:

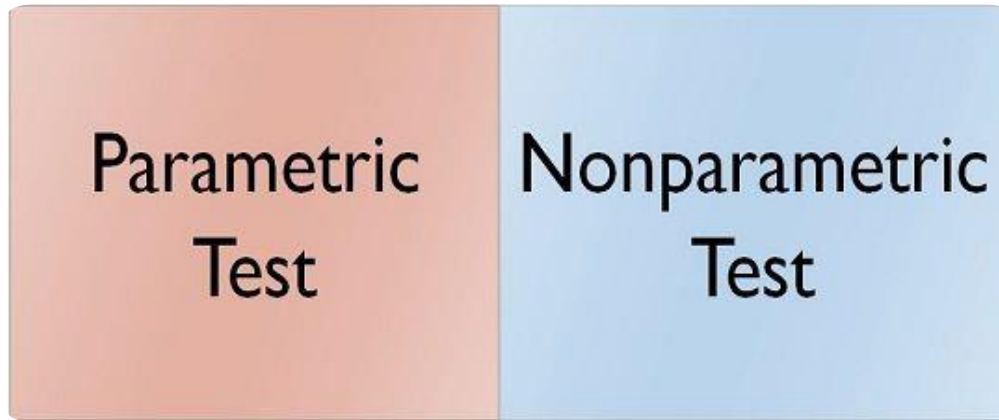
What is Mixed Method ?

- [Types of Mixed Methods Research Designs ~GM Lectures \(youtube.com\)](#)

SPSS: Data Entry

- *** IN research, it is important to ensure reliability, validity and credibility.
- Ensuring appropriate and accurate data entry is a critical step towards achieving those research benchmarks.
- SPSS is sensitive and runs analysis based on the data you provide. Wrong data – wrong SPSS outputs.
- Must ensure:
appropriate labelling of variables,
appropriate description of likert scale points used,
appropriate measure/data specification (scale, nominal, or ordinal), and
appropriate entry of data (responses).

Parametric or non-parametric Analysis



- Data Purification and ensuring data suitability for parametric analysis
- Quantitative studies usually examine the relationship between dependent and independent variables

SPSS IN ACTION

MonarchyInMoviesDataset.sav [DataSet1] - IBM SPSS Statistics Data Editor

Visible: 4 of 4 Variables

	Title	MonarchyPre sent	Year	Company	var	var	var	var	var	var
1	1	0	2017	1						
2	2	0	2017	2						
3	3	0	2017	3						
4	4	0	2016	2						
5	5	3	2019	4						
6	6	0	2018	5						
7	7	3	2019	6						
8	8	0	2018	2						
9	9	0	2015	2						
10	10	3	2019	7						
11	11	3	2023	8						
12	12	3	2015	3						
13	13	0	2022	3						
14	14	2	2016	4						
15	15	1	2018	4						
16	16	0	2016	3						
17	17	0	2016	3						
18	18	3	2023	9						
19	19	0	2019	2						
20	20	0	2016	4						
21										

Overview Data View Variable View

IBM SPSS Statistics Processor is ready Unicode:ON Classic

Activity

1

Please download
the SPSS Software
from UWTSD Site

2

Download the
MBA dataset from
Moodle

3

Import the MBA
excel file into SPSS



Data Purification

Handling missing data

Several methods of checking if data is normally distributed

- Checking the histograms plots. Bell-shaped histogram plots = normal distribution (Field, 2005, 2009)
- 2. Check the skewness and kurtosis estimates
- Skewness can be determined by comparing the mean and median values for each variable. When values are close, normal distribution conclusion is legitimate (Diamantopoulo and Schlegelmilch, 1997; Field, 2005 and 2009)

Ensuring Normality of Distribution

Kurtosis values should ideally be close to zero (e.g. Field, 2009 and 2005; George and Mallery, 2010). To conclude that there is normal distribution in data, the kurtosis values should range between -2 and +2 ((George and Mallery, 2010).

- 3. Carry out a significance test - significance tests such as Kolmogorov-Smirnov and Shapiro-Wilk tests (e.g. Field, 2005; 2009). If significance level shows ($p < .05$), it implies there is deviation from normal distribution
- Data cannot be perfectly normally distributed, Approximate normal distribution will do.

- Parametric and Non Parametric Analysis

Tests of Comparison		
Number of Groups	Parametric	Non Parametric
2 groups	t-test	Chi-square
More than 2 groups	Anova	Kruskall-Wallis

Correlation Analysis	
Parametric	Non Parametric
Pearson r Correlation	Spearman rank Correlation

Q & A 1

Using Mixed-Method Approach

Why
and
How



Prifysgol Cymru
Y Drindod Dewi Sant
University of Wales
Trinity Saint David

Q & A2

- What analytical Approach to take?

Parametric Analysis

Or

Non-Parametric Analysis

Normal Distribution of Data





PARAMETRIC

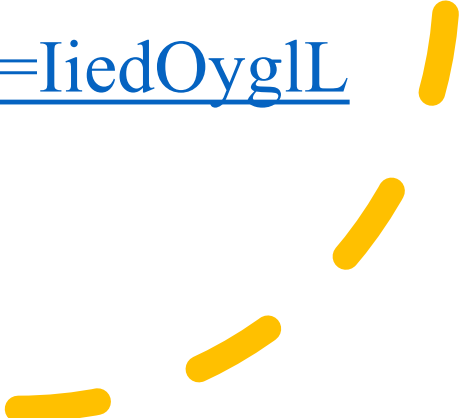
OR

NON-PARAMETRIC

[Parametric and Nonparametric Tests \(5:15 mins\)](#)

Calculate normality (9:14 mins)

<https://www.youtube.com/watch?v=IiedOyglLn0>



Q & A Session

Detailed analysis of the contents of this video:

Survey data to SPSS (30:44 mins)

https://www.youtube.com/watch?v=el9TQSZ_6yE

Descriptive Statistics



Describe the basic features in the data for a study



Provide simple summaries about the sample and measures



Descriptive Statistics are not Inferential Statistics

Descriptive Analysis

- Typical Descriptive Statistics would include:
- Mean : sum of scores divided by the number of scores
- Median: the middle score of all the scores in a distribution
- Mode: the value with the greatest frequency in the distribution
- Standard Deviations: a commonly used measure of dispersion, it is the square root of the variance
- Maximum: Maximum score on the scale
- Minimum: Minimum score on the scale
- Range: The distance between the minimum and maximum values
- Frequency: The extent of frequency of each point on the scale in the data

Central Tendency and Dispersion Estimate

Central Tendency

- Core central tendency estimates that you would need to report:
 - Mean
 - Median
- **Dispersion Estimate** Dispersion implies the spread of the values around the central tendency. Core dispersion estimate that you would need to report:
 - Standard Deviation

Q & A

- Descriptive Statistics:
- <https://www.youtube.com/watch?v=XrfQfEwjZA4>
- [Course: Quantitative Research Methods \(LCDB7011\), Tile: Week 4-5 Basics of Statistical Analysis \(uwtsd.ac.uk\)](#)