

An Introduction to Data Analysis; making sense of numbers and words

Dr Anne Chant

Canterbury Christ Church University

In this session

- * Aim: to familiarise colleagues with the concepts and processes of data analysis
- * Learning outcomes:
 - * To explore different kinds of knowing
 - * To understand the concepts of qualitative and quantitative data
 - * To be clear of the decisions you have to make in your own research

What are you wondering?

How does your question start?

- What?
- Why?
- Who?
- How many/much?
- When?
- Do/Does.....?
 - THE ANSWER IS IN THE QUESTION

What's the question?

Positivist

- * Objective
- * Impartial (if it's possible)
- * Repeatable outcomes
- * Measurable
- * Aims for generalisations (often)

Interpretative

- * Subjective
- * Partial – the researcher is in it
- * Different researchers and participants will get different outcomes
- * Interested in particularities, not generalities

Samples

Random

Random

- * Aims to represent a larger population
- * So the numbers and composition matter

Non-random

Non-Random

- * Does not aim to be representative
- * So numbers and composition matter less

Displaying quantitative data

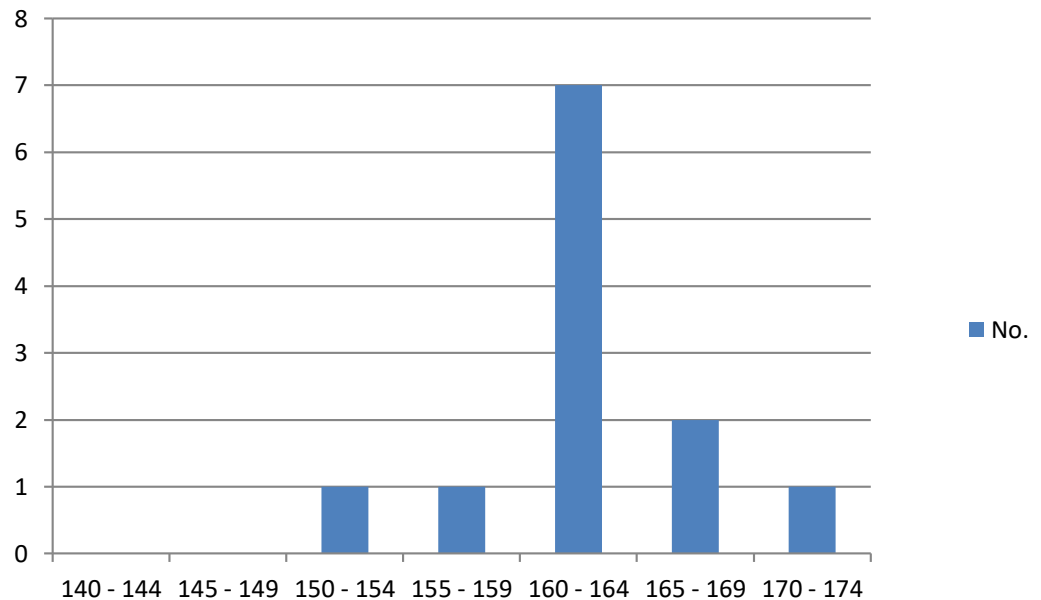
The question will have been ‘how many?’, ‘how much?’, ‘how often?’, ‘preferences’, correlations or relationships...

- * Bar charts
- * Graphs
- * Pie charts
- * Histograms – continuous data / categories

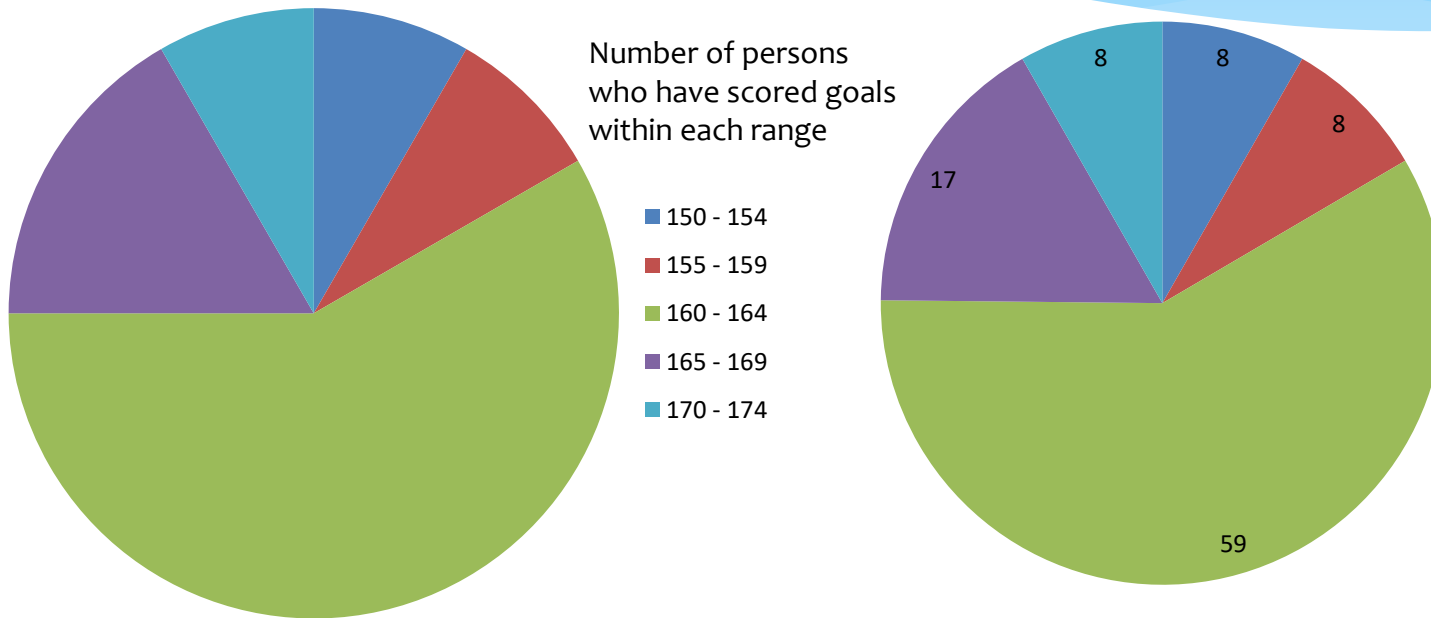
Displaying the data

- * Example: the number of people who have scored the number of goals within the range shown as a bar chart:

140 - 144	0
145 - 149	0
150 - 154	1
155 - 159	1
160 - 164	7
165 - 169	2
170 - 174	1



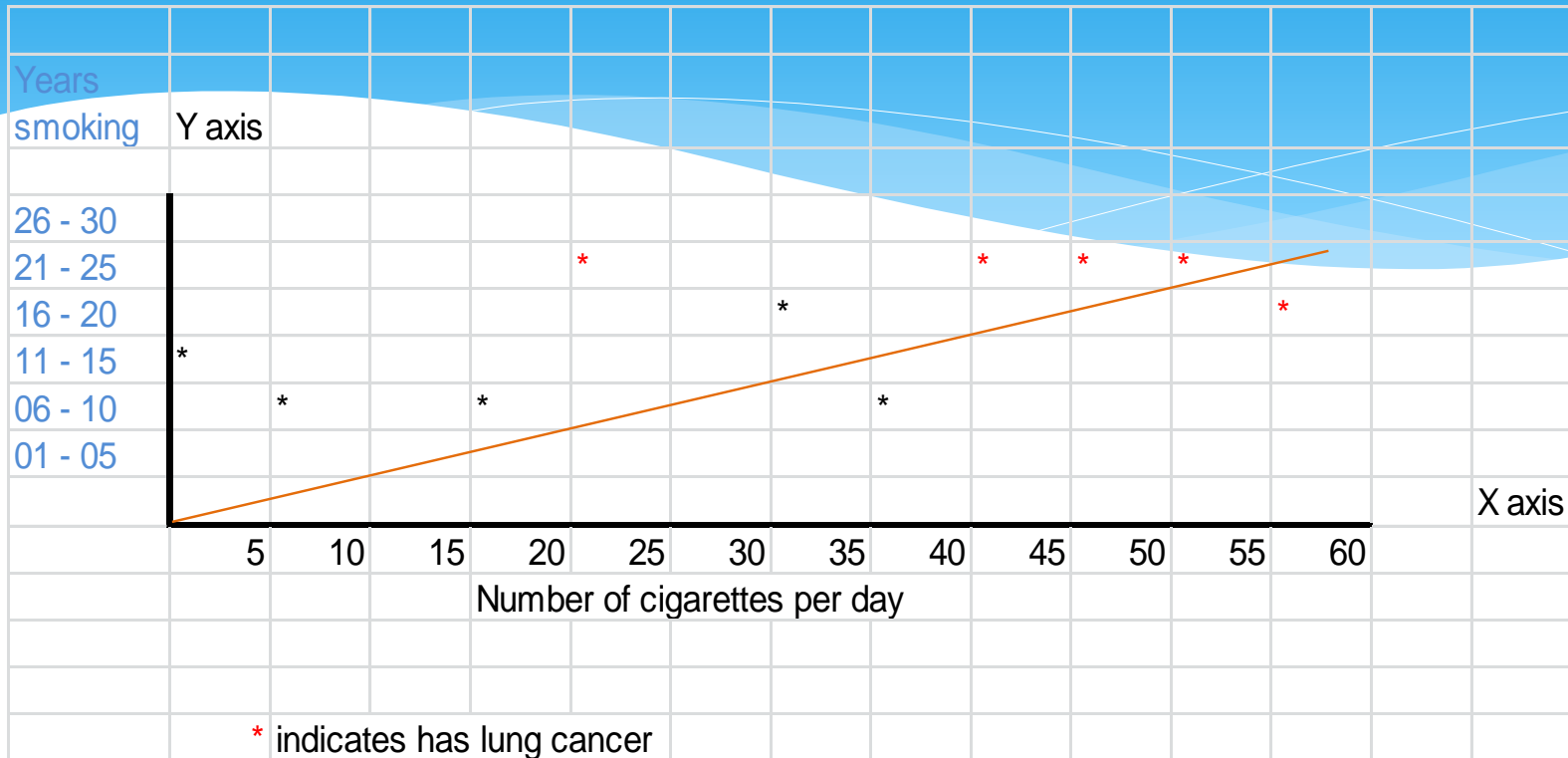
Displaying the data



N= 12

Shown as Percentages %

Scatter plots



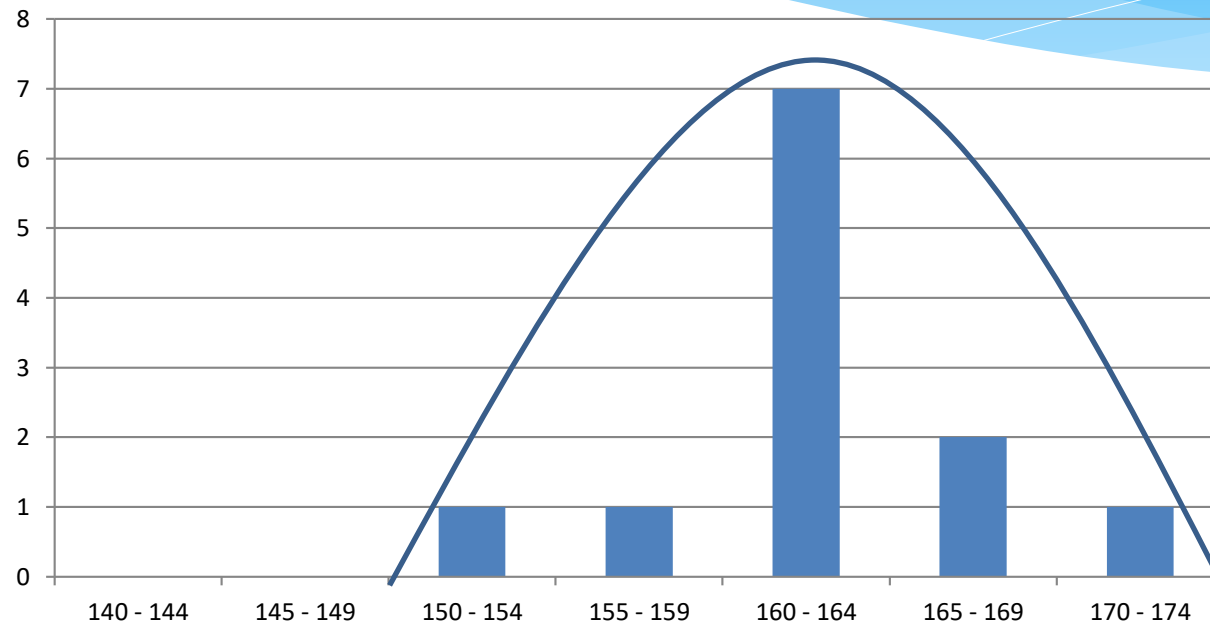
- * A Scatter (XY) Plot has points that show the relationship between two sets of data; that is a 'correlation'.
- * **Correlation does not evidence 'cause'**
- * Regression correlation can evidence 'relationship' between the variables and be used to 'predict'

Likert Scale

	Strongly Agree		Agree		Disagree	Strongly Disagree	(n)
Group A	50	25%	50	25%	70	30	200
Group B	60	30%	40	20%	50	50	200
A+B	110	55%	90	45%	120	80	400

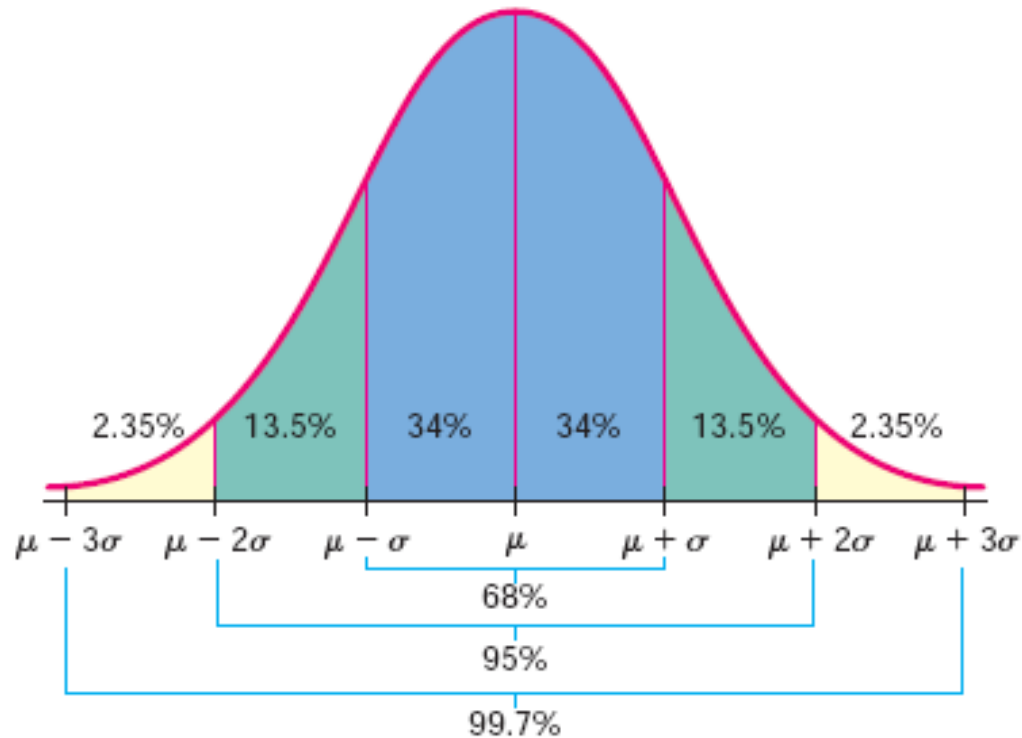
I can say in Group B 50 % or half agreed or strongly agreed ($30\% + 20\% = 50\%$).
What I cannot meaningfully calculate is the average response (i.e. the mean) For example if 7 out of 10 people agree that yellow is cheerful colour, I can say more than half or over 50% agree but I cannot calculate the average response.

Normal distribution

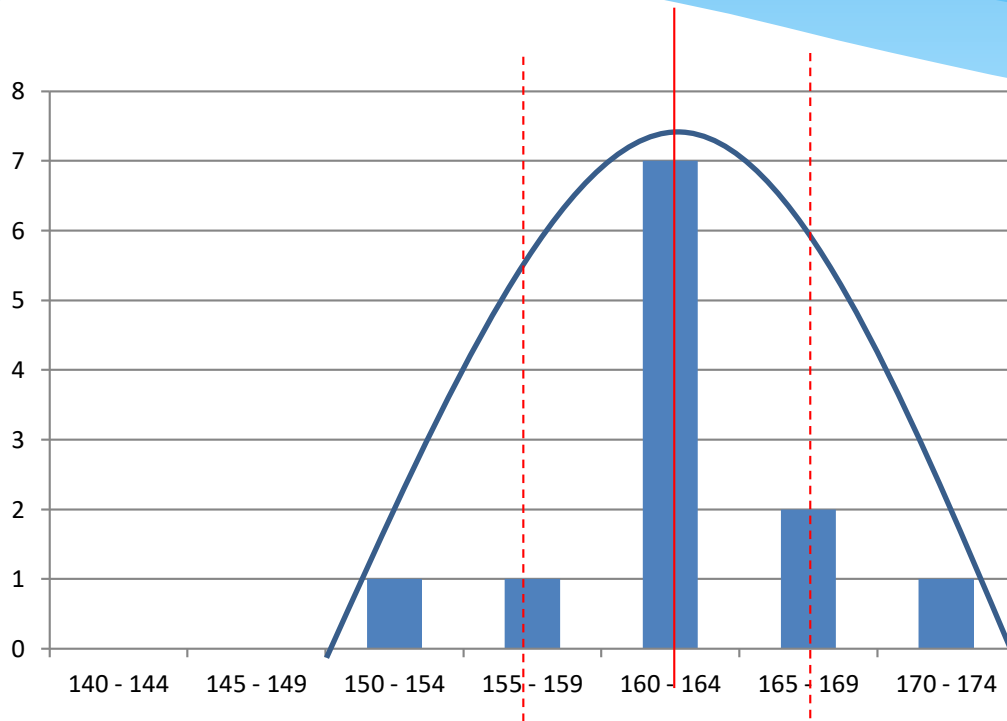


Normal distribution

Area Under a Normal Curve



Normal distribution



Mean is half way between
150 and 174 = 162cm

Standard deviation is 6
 $174 - 150 = 24 / 4 = 6$

95% is within 2 deviations
 $162 \pm 12 =$
150cm – 180cm

Standard Deviation: a measure of how spread out numbers are.
Its symbol is σ (the greek letter sigma)

Quantitative Research terminology

- * **Variable** – something that varies amongst the population:
 - age
 - weight
- * **Reliability** – whether a measure is stable
- * **Correlation** – cause and effect?
- * **Validity**
 - Construct validity – is it measuring what it says it is measuring?
 - Internal validity – does a relationship (correlation) evidence causality?
 - External validity – can it be applied elsewhere (generalised)

Looking into the effectiveness of school counselling. (Awuor, P, Aloka, P and Raburu, P (2018)

Table 1. Descriptive Statistics on Effectiveness of Guidance and Counseling

Indicator	SA	A	U	D	SD
Guidance and counseling is effective in managing student behaviour.	50(26.18%)	80(41.88%)	30(15.71%)	22(11.52%)	9(4.71%)
Guidance and counseling has reduced tension and strikes in schools.	90(47.12%)	82(42.93%)	6(3.14%)	5(2.62%)	8(4.19%)
Guidance and counseling helps students realize their mistakes.	46(24.08%)	94(49.21%)	28(14.66%)	17(8.90%)	6(3.14%)
Guidance and counseling services helps students develop positive attitude towards school.	82(42.93%)	68(35.60%)	5(2.62%)	26(13.61%)	10(5.24%)
Guidance and counseling makes students feel accepted by their teachers.	60(31.41%)	75(39.27%)	30(15.71%)	12(6.28%)	14(7.33%)

Cont..

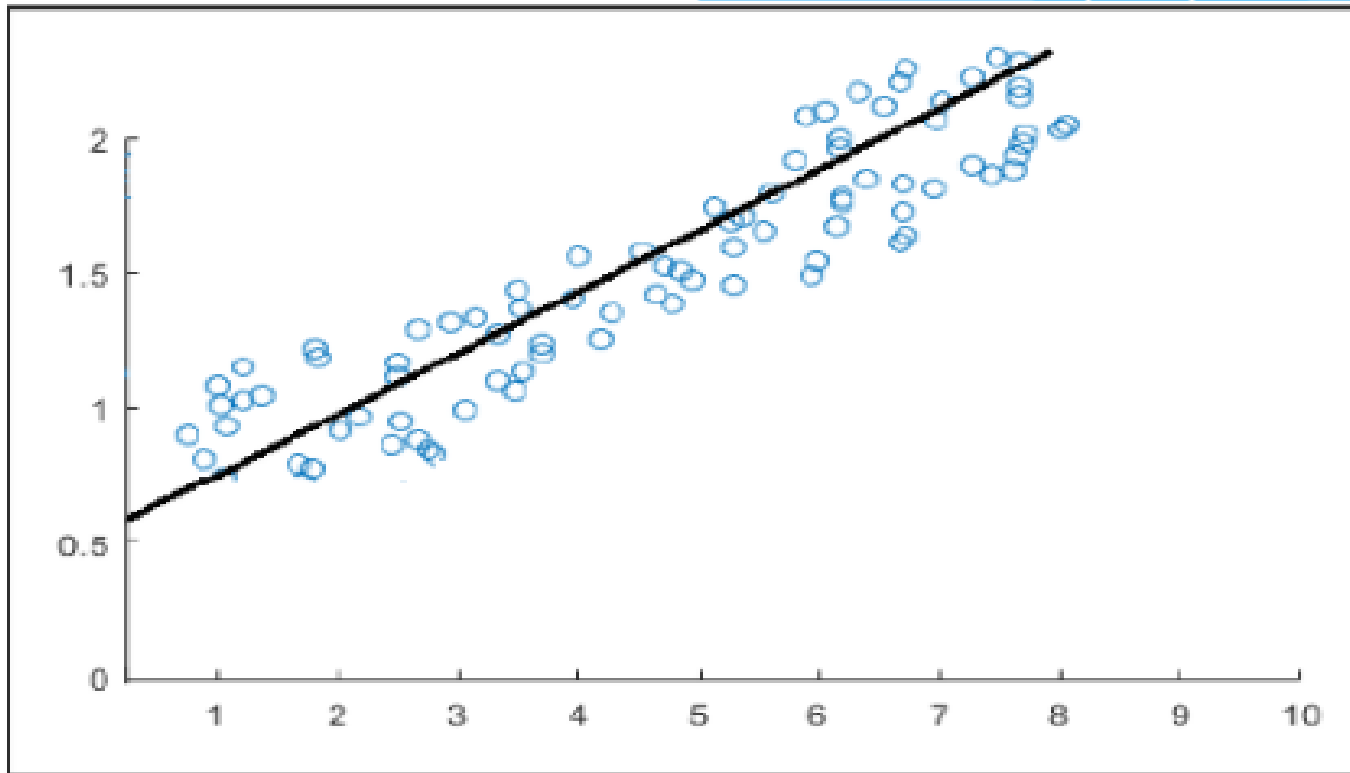


Figure 1. Scatter plot for Correlation between Guidance and Counseling and Management of Student Behaviour

Qualitative data

Is likely to have come from questions such as:

- * Why?
- * What is the experience or meaning?

Or that explore:

- * Opinions and perspectives
- * Stories
- * Influences

Qualitative methods

- * Interviews: structured, semi-structured or unstructured
- * Focus Groups
- * Case study
- * Autobiography or autoethnography
- * Creative methods
 - * Visual art
 - * Poetry
 - * Fiction

Qualitative Research terminology

- * **Reliability** – whether data has been collected with care, respect for its sources and all partiality and relational issues have been acknowledged.
- * **Validity**
 - Does the work have ‘value’?
 - Have the methods been justified?
 - Has data been analysed using a systematic approach?
 - Have all ethical and procedural considerations be taken and upheld?

Displaying Qualitative Data

This could take the form of:

- * Transcripts of interviews or focus groups
- * Creative works
- * Journals

Transcription

slightly an introvert...well not slightly ..I am an introvert ..so if you think about an introvert having to constantly integrate themselves it does bring out a somewhat shy, um quiet, contemplative person who tends to look and ...um ...andWAIT... - till they feel comfortable . And I think that is very much part of er er my behaviour patterns if you like.

A – your coping strategy?

G – my coping strategy.

A – but not everyone would react like that? Others may cope in a different way...but that was the way..

G – that was the way I did it. So always very careful,

A – careful in case what? What would be the worse case scenario that you were trying to avoid happening....

G – I suppose it's just rejection.....afraid that you're not going to be accepted , that people will think you're strange or different – but you are (smiles)...

A – can't do anything about it....G, No. So so I think I have always been, I suppose always very careful....

A – and just waiting for them to come to you?

G – yeh. Waited for people to come to me, waited for to know where I was, I understood the layout, you know, understood the dynamics so that I could....that were in front of me (A, right) ...and I think I still do it to this very day...

A – so I'm getting a picture of a little girl – you haven't mentioned your sister yet, perhaps we will in a sec.. of quite a lonely little girl?

G – I don't think I was lonely in as much as I've always had friends - I've always made friends...

Journals or autobiographical writing

- * On our way to the concert we talked about her breakup with her civil partner and her ongoing mending. We talked about my struggle with 'losing' my daughter to the love of her life and where that leaves me and my notion of self. We talked about jealousy and love and letting go. The concert was entitled 'Circle of Life' and took us through stages of life with music and also photographs. We cried at some and laughed at others. There was a real sense of a connection with the past; our own and that of our family. We talked in the car about her birth story. Everyone knows in our family that she was born by caesarean section and that both she and her mother nearly died. She writes about this in her piece for the 'Tangled Roots' project and I talked to her about Laura Formenti's work on birth stories and how they can have an impact on how we see ourselves; the miracle child, or the long awaited treasured baby, or the accident, or in xxx's case the pain and near disaster (Formenti, 2014). I was minded of my own mother's birth story when I first heard her speak; she had survived but her mother had died in childbirth resulting in her being 'given away' to a neighbour. The writer and daughter of Alice Walker, Rebecca Walker also touches on the impact of birth stories in her book about the mixed race life 'Black White Jewish; autobiography of a shifting self'

Approaches to qualitative analysis

This needs a systematic process

- * Thematic analysis – looking for ‘thick and rich’ descriptions. Informed by feminist and post-colonial studies
 - * Grounded approach (Straus and Corbin, 1998)
 - * Coding
 - * Case Study
 - * Discourse analysis
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- * Account is taken of the positionality of the researcher, their interpretation and the impact of the context, timing and ethnography of the data gathering

An interpretative approach...



... understands that research is an interactive process shaped by his or her own personal history, biography, gender, social class, race, and ethnicity, and by those of the people in the setting. (Denzin & Lincoln, 2003: 9)

We care less about our “objectivity” as scientists than we do about providing our readers with some powerful, propositional, tacit, intuitive, emotional, historical, poetic, and empathic experience of the other via the texts we write (Lincoln & Denzin, 2003: 629)

So how do we get any meaning/answers from data?

- * Directly
 - * The data shows that more....
 - * The data suggests that young people between 16-19 received fewer....
 - * Literature may help us to make sense of this ie 'why'?
- * Indirectly through interpretation and meaning making
 - * Participant A said that.....this gives us insights into and illuminates the experience of....

References

- * Awuor, P, Aloka, P and Raburu, P (2018) 'Effectiveness of Guidance and Counselling in the Management of Student Behaviour in Public Secondary Schools in Kenya.' *International Journal of Applied Psychology*. 8(1): 6-11 DOI: 10.5923/j.ijap.20180801.02
- * Corbin, J.M. and Strauss, A. (1990) 'Grounded theory research: Procedures, canons, and evaluative criteria'. *Qualitative Sociology* 13, 3-21.
- * Lincoln, Y.S. and Denzin, N. K. (Eds) (2003) *Turning Points in Qualitative Research: tying knots in a handkerchief*. Oxford: AltaMaria Press.