

# ETC5523: Communicating with Data

## Basic communication theory and practice

Lecturer: *Michael Lydeamore*

Department of Econometrics and Business Statistics

✉ [michael.lydeamore@monash.edu](mailto:michael.lydeamore@monash.edu)

📅 Week 1

🌐 [cwd.numbat.space](http://cwd.numbat.space)

## Aim

- Basic communication theory and its relevancy with communicating with data
- Demonstrate communication competency by selecting appropriate behaviour based on audience and self monitoring
- Identify and apply rhetorical elements to improve data storytelling
- Clearly articulate and express technical problems for others to help you

## Why

- Effective communication with data is a blend of hard and soft skills
- You need the hard skills to process and understand the data
- But you also need the soft skills to get the message across to others

# Communicating

“ *To effectively communicate, we must realize that we are all different in the way we perceive the world and use this understanding as a guide to our communication with others.*

– *Anthony Robbins*

# Communicating **with data**

“ *The two words ‘information’ and ‘communication’ are often used interchangeably, but they signify quite different things. Information is giving out; **communication is getting through.***

– *Sydney J. Harris*

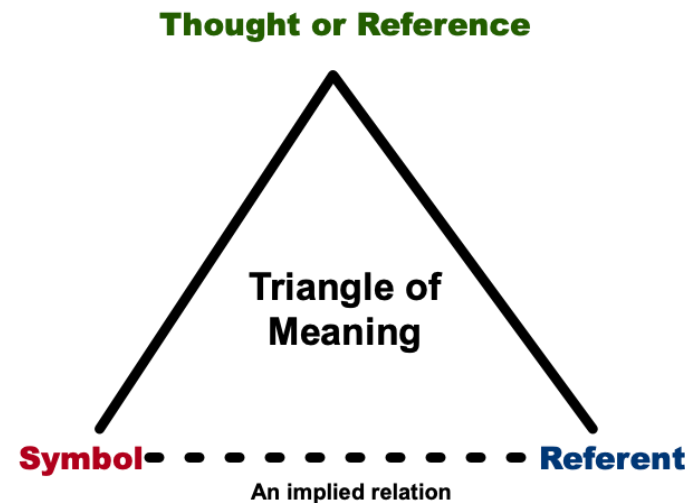
# The Basics of Communication Theory

 Communication here refers to human communication

In this section, communication refers to *human* communication.

# Communication is **symbolic**

- Arbitrary nature of symbols is overcome with linguistic rules
- Agreement among people about these rules is required to effectively communicate
- **Meanings rest in people, not words**



Ogden and Richards (1923) *The Meaning of Meaning*  
Drawn by @statsgen

# Communication is a **process**

Communication is often thought of as discrete, independent acts but in fact it is a continuous, ongoing process.

## Linear communication model

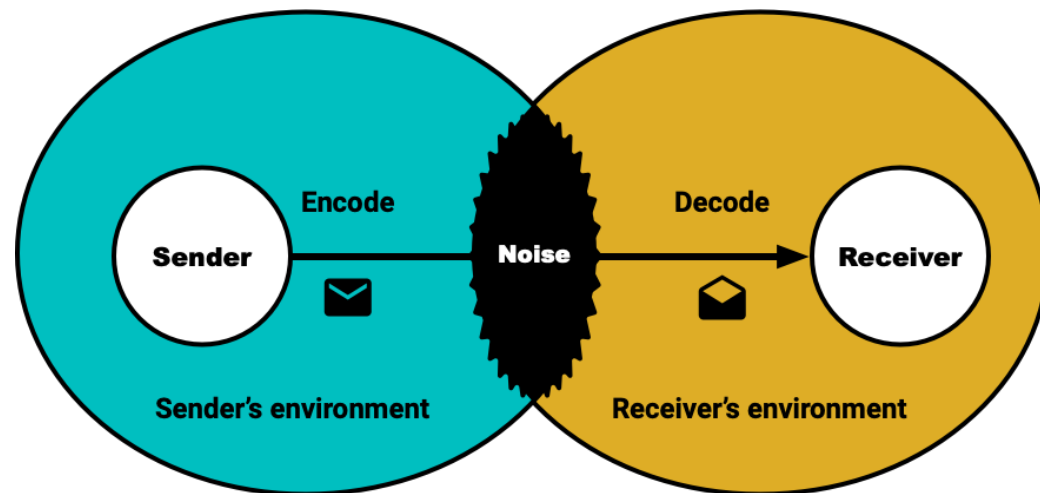


Figure inspired by Adler and Rodman (2006) Understanding Human Communication  
Drawn by @statsgen

## Transactional communication model

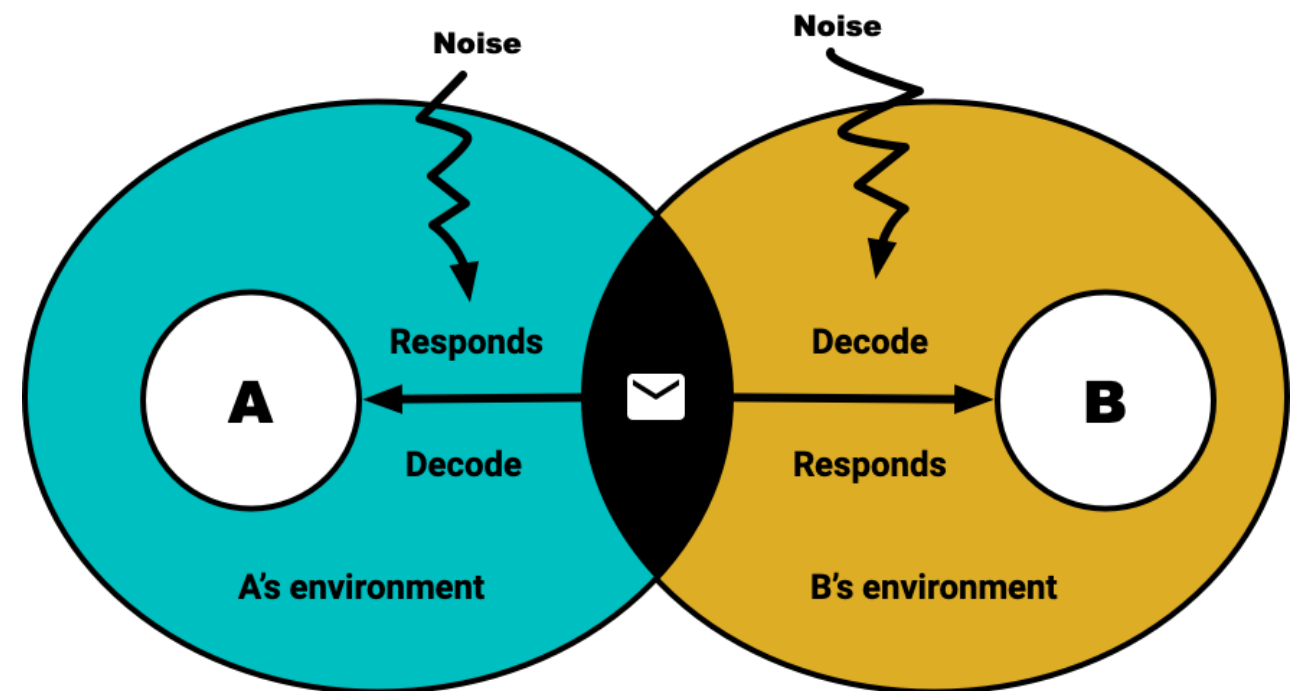


Figure inspired by Adler and Rodman (2006) Understanding Human Communication  
Drawn by @statsgen

# Communication **competence**

- There is no single, ideal way to communicate
- Competence is situational and relational (where, what and who)
- Ability to **select the most appropriate behaviour** in a particular situation
- Skill to **perform behaviour** not just knowing them
- **Empathy** or perspective taking
- **Cognitive complexity** – ability to construct a variety of framework for viewing an issue
- **Self-monitoring** – paying close to your own behaviour and use this to shape your behaviour



# Types of communication

- **Intrapersonal** – communicating with one-self
- **Dyadic/interpersonal** – two people interacting
- **Small group** – two or more people interacting with group membership
- **Public** – a group too large for all to contribute
- **Mass** – messages transmitted to large, wide-spread audiences via media

## Tutorial

How does your communication strategy change for different types of communication?

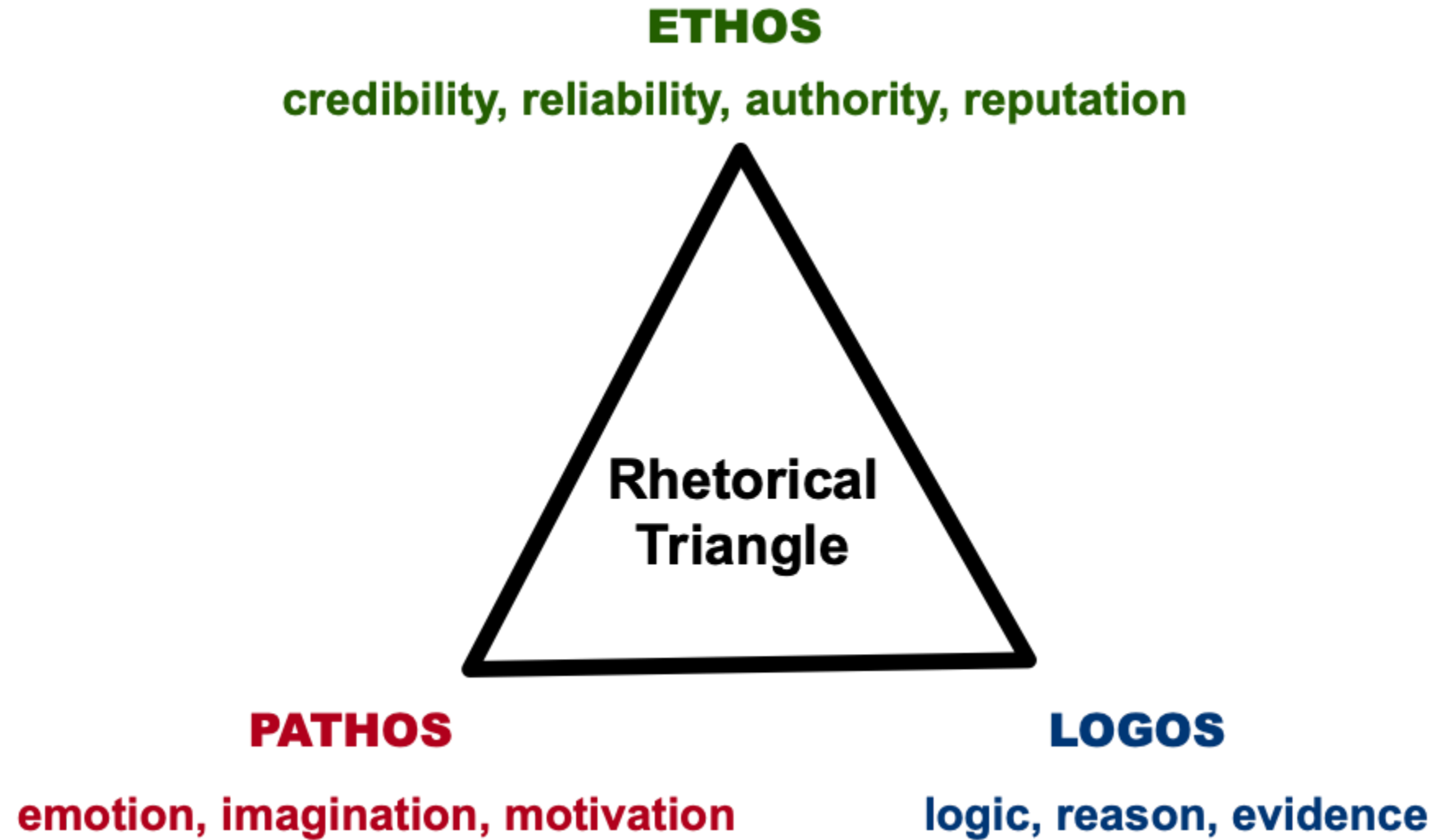
# Effective communication

- Communication doesn't always require complete understanding
- We notice some messages more and ignore others, e.g. we tend to notice messages that are:
  - intense,
  - repetitious, and
  - contrastive.
- **Motives** also determine what information we select from environment

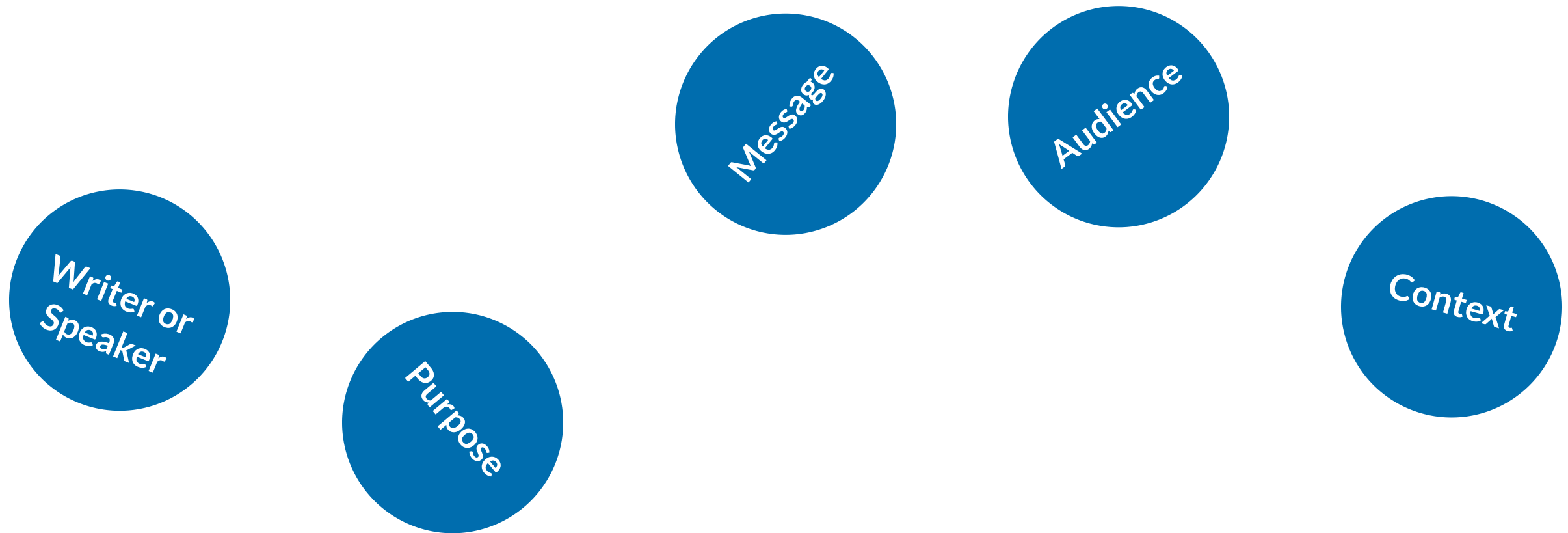
# Rhetorics

The art of effective or persuasive speaking or writing

# Rhetorical Triangle



# Rhetorical Situation



“ *No one ever made a decision because of a number. They need a story.*  
– *Daniel Kahneman*

“ *Maybe stories are just data with a soul.*  
– *Brene Brown*

# Hans Rosling

# Communicating *your problem*

- Asking for help, requires you to communicate what your problem is to another party.
- How you communicate your problem, can assist you greatly in getting the answer to your problem.



# Asking for help Part 1

- What do you think about the question below?

## Adjusting size of two ggplots within single R chunk in Rmarkdown

[Ask Question](#)

Asked 2 days ago   Active 2 days ago   Viewed 13 times



-1

I am looking to adjust the size of two separate ggplots within the same R chunk in Rmarkdown. These plots must be different sizes when outputted as a pdf, so defining the dimensions at the beginning of the chunk doesn't work. Does anyone have any ideas?



Thank you!



r

ggplot2

latex

r-markdown

# Asking for help Part 2

- What do you think now?

I am looking to adjust the size of two separate ggplots within the same R chunk in Rmarkdown. These plots must be different when outputted as a pdf, so defining the dimensions at the beginning of the chunk doesn't work. Does anyone have any ideas? My code is below.

```
1 ```{r, fig.height = 3, fig.width = 3}
2 ggplot(df, aes(weight, height)) +
3   geom_point()
4
5 ggplot(df, aes(height, volume)) +
6   geom_point()
7 ```
```

# Asking for help Part 3

- Is this better?

I am looking to adjust the size of two separate ggplots within the same R chunk in Rmarkdown. These plots must be different when outputted as a pdf, so defining the dimensions at the beginning of the chunk doesn't work. Does anyone have any ideas? My code is below.

```
1 ```{r, fig.height = 3, fig.width = 3}
2 library(ggplot2)
3 ggplot(df, aes(weight, height)) +
4   geom_point()
5
6 ggplot(df, aes(height, volume)) +
7   geom_point()
8 ```
```



# Asking for help **1**

Part 4

- Okay better now?

I am looking to adjust the size of two separate ggplots within the same R chunk in Rmarkdown. These plots must be different when outputted as a pdf, so defining the dimensions at the beginning of the chunk doesn't work. Does anyone have any ideas? My code is below.

```
1 ```{r, fig.height = 3, fig.width = 3}
2 library(ggplot2)
3 df <- read.csv("mydata.csv")
4 ggplot(df, aes(weight, height)) +
5   geom_point()
6
7 ggplot(df, aes(height, volume)) +
8   geom_point()
9 ```
```

# Asking for help Part 5

- Are we done now?

I am looking to adjust the size of two separate ggplots within the same R chunk in Rmarkdown. These plots must be different when outputted as a pdf, so defining the dimensions at the beginning of the chunk doesn't work. Does anyone have any ideas? My code is below.

```
1 ```{r, fig.height = 3, fig.width = 3}
2 library(ggplot2)
3 ggplot(trees, aes(Girth, Height)) +
4   geom_point()
5
6 ggplot(trees, aes(Height, Volume)) +
7   geom_point()
8 ```
```

**? How to ask questions?**

# Checklist (note: not an exhaustive checklist)

- ☐ Is the problem clearly and succinctly described?
- ☐ Is the expected solution or behaviour outlined?
- ☐ Are you asking the right people at the right place?

## If the question is asked in an public forum or similar:

- ☐ Can people who can answer your question find your question? E.g. does the post have appropriate tags or keywords to reach the right experts?

## If the problem is computer system related...

- ☐ Can the problem be easily reproduced on other people's system?
- ☐ Is the minimum reproducible code or steps supplied?

## If the problem is based on data ...

- ☐ Is the data supplied?
- ☐ If the data is big, could you cull your data further to communicate or reproduce the problem?



# Asking for help 1 Check

## Adjusting size of two ggplots within single R chunk in Rmarkdown

[Ask Question](#)

Asked 2 days ago   Active 2 days ago   Viewed 13 times



-1



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Thank you!



r

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r-markdown

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- ☐ Is the minimum reproducible code or steps supplied?
- ☐ Is the data supplied?
- ☐ If the data is big, could you cull your data further to communicate or reproduce the problem?



# SOS Asking for help 2

- How about the question on the right?
- What makes it *hard* or *easy* for people to answer this question?

How to plot line graph using date as x and freq as y in R using ggplot?

Asked 3 days ago · Active 3 days ago · Viewed 26 times

I have this data frame `Count_date1` That I need to plot using date wise order

	Date	freq
1	13-04-2015	24
2	13-05-2015	12
3	13-06-2015	32
4	14-04-2015	23
5	14-05-2015	15
6	14-06-2015	16
7	15-04-2015	12

The Overflow Blog

- ✓ The key comp community
- ✓ Podcast 258: v

Featured on Meta

34	24-04-2015	24
35	24-05-2015	7

I tried this code

```
ggplot(count_date1, aes(Date, freq)) +
  geom_point() +
  geom_line(aes(group=Date)) +
  xlab("Date") +
  ylab("No. of Complaints")
```

but the graph looks too ugly and uninterpretable with dates getting congested can anyone help ???

0 R: How to plot using a loop

0 How to plot a error plots w

Hot Network Q

- How languages co different syllables f
- Would mail in votin Republicans?
- Am universities su

# Session Information

You can easily get the session information in R using `sessioninfo::session_info()`.

Scroll to see the packages used to make these slides.

```
1 sessioninfo::session_info()
```

```
— Session info —
setting  value
version  R version 4.3.0 (2023-04-21)
os       macOS Ventura 13.4
system   aarch64, darwin20
ui       X11
language (EN)
collate  en_US.UTF-8
ctype    en_US.UTF-8
tz       Australia/Melbourne
date     2023-07-18
pandoc   3.1.2 @ /usr/local/bin/ (via rmarkdown)

— Packages —
package      * version date (UTC) lib source
```



# Reproducible Example with **reprex** LIVE DEMO

- Copy your minimum reproducible example then run

```
1 reprex::reprex(session_info = TRUE)
```

- Once you run the above command, your clipboard contains the formatted code and output for you to paste into places like [GitHub issues](#), [Stackoverflow](#) and forums powered by [Discourse](#), e.g. [RStudio Community](#).
- For general code questions, I suggest that you post to the community forums rather than Moodle.

# Communicating with Data

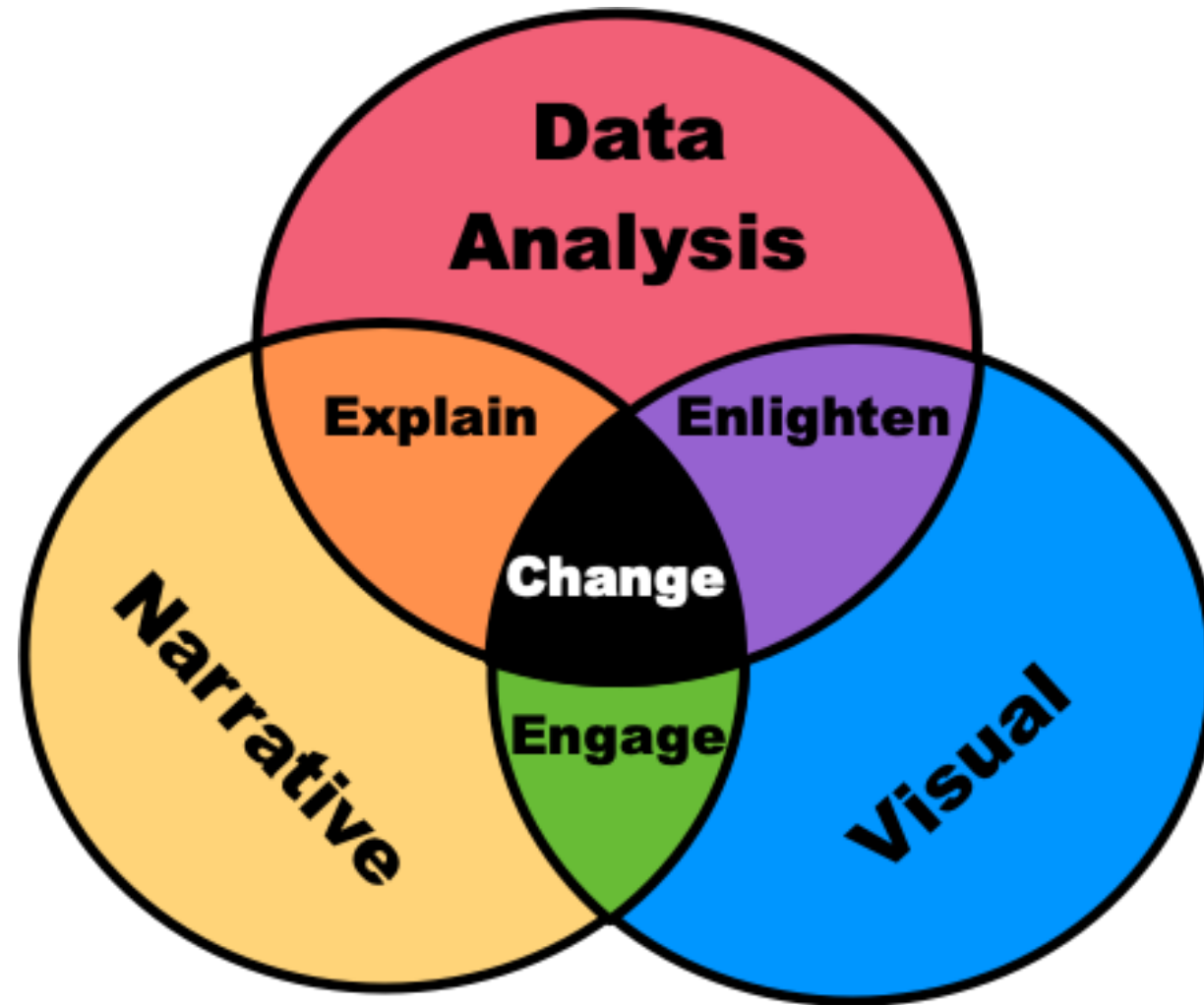


Figure inspired by Spencer (2022) Data in Wonderland  
Drawn by @statsgen

# Week 1 Lesson

## ! Summary

- Communication is a symbolic, ongoing process that requires ***getting through*** to other parties
- There is no single ideal way to communicate – communication competence depends on situation and relations but a competent communicator can select and perform appropriate behaviour based on **seeing other people's perspectives** and **understanding their own behaviour**
- We discussed about the **elements of rhetorics** and how it relates to telling a compelling data story
- We looked at the case study with communicating your problem to ask for help

# Week 1 Lesson

## Resources

- See more at [Learn R Chapter 3: Troubleshooting and asking for help](#)
- Watch more about storytelling with data at:
  - [Why storytelling is so powerful in the digital era](#)
  - [Why storytelling is more trustworthy than presenting data](#)
  - [Making data mean more through storytelling](#)

