ETC5523: Communicating with Data

Basic communication theory and practice

Lecturer: *Emi Tanaka*

Department of Econometrics and Business Statistics

✉ emi.tanaka@monash.edu

📅 Week 1

🌐 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

MONASH University

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*

MONASH University

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*

MONASH University

The Basics of
Communication Theory

> ⚠️ **Communication here refers to human communication**
>
> In this section, communication refers to *human* communication.

MONASH University

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**

Thought or Reference

Triangle of Meaning

Symbol - - - - - - - - - - **Referent**

An implied relation
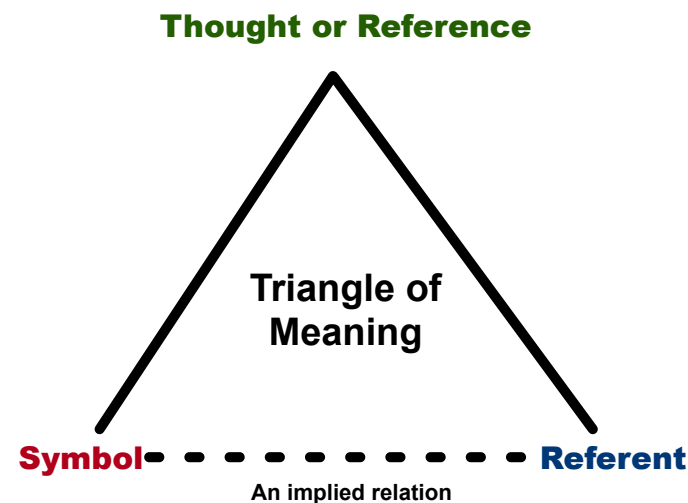
Ogden and Richards (1923) The Meaning of Meaning
Drawn by @statsgen

MONASH University

Communication is a process

Communication is often thought of as discrete, independent acts but in fact it is a continous, ongoing process.
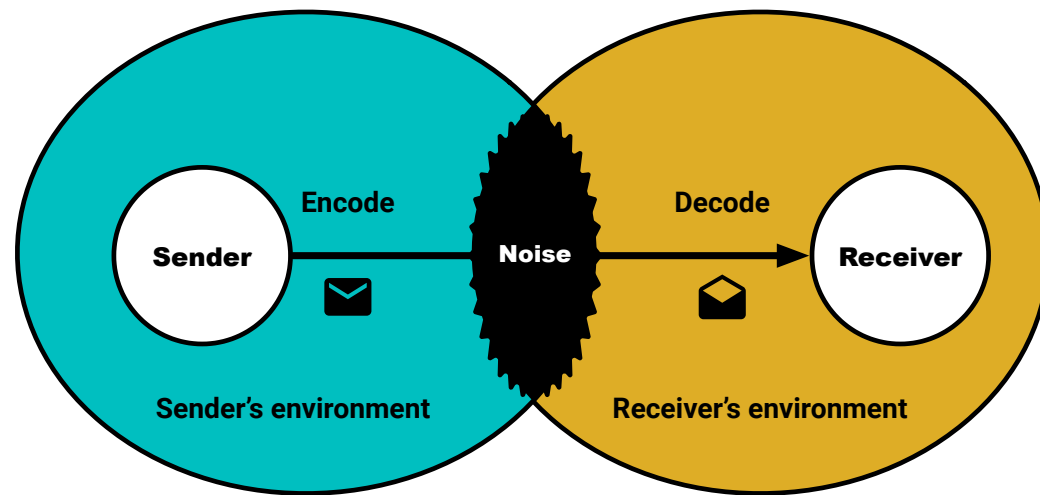
Linear comunication model

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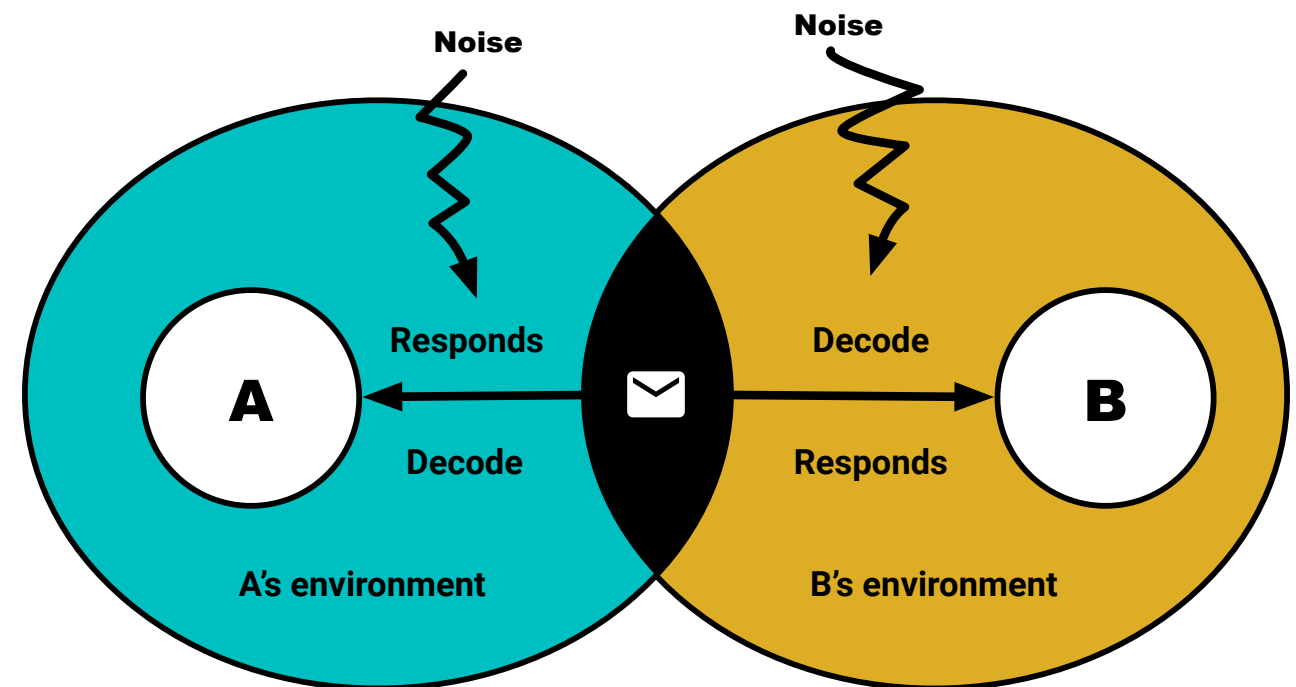Drawn by @statsgen

Transactional communication model

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

MONASH University

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

MONASH University

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?
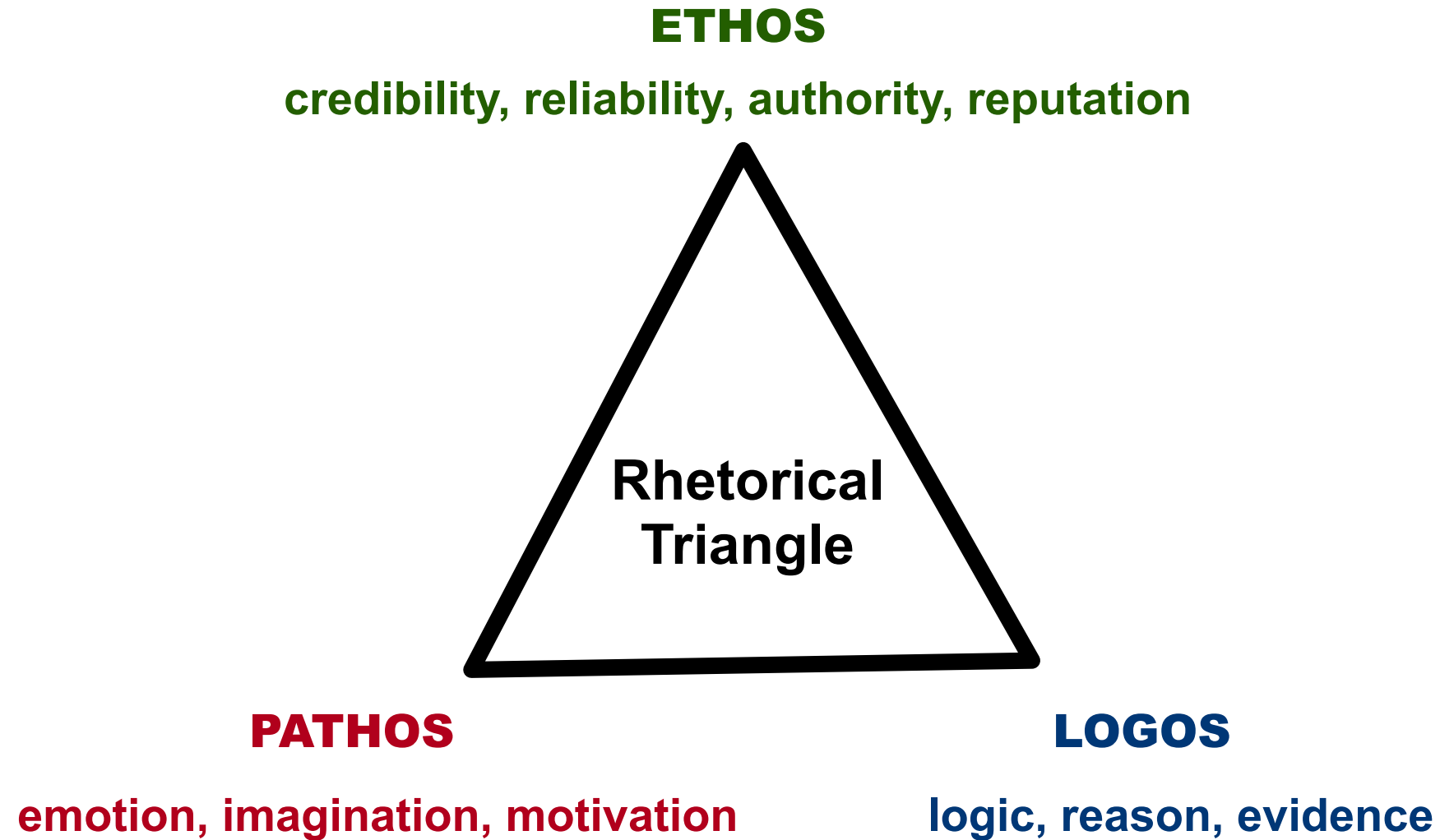
MONASH University

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

  - **constrastive**.

- **Motives** also determine what information we select from environment

MONASH University

Rhetorics

The art of effective or persuasive speaking or writing

MONASH University

Rhetorical Triangle

ETHOS

credibility, reliability, authority, reputation

Rhetorical Triangle

PATHOS

emotion, imagination, motivation

LOGOS

logic, reason, evidence

MONASH University

Rhetorical Situation

Writer or Speaker

Purpose

Message

Audience

Context

MONASH University
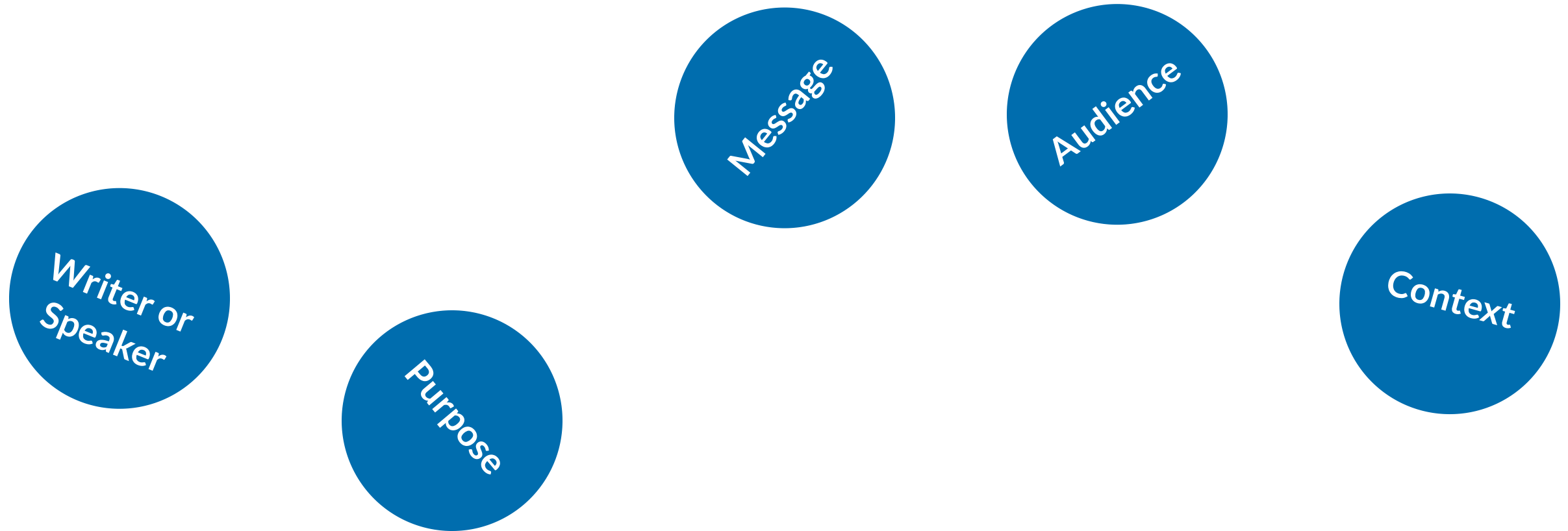
" *No one ever made a decision because of a number. They need a story.*

– Daniel Kahneman

" *Maybe stories are just data with a soul.*

– Brene Brown

MONASH University

Hans Rosling

MONASH University

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.

MONASH University

🆘 Asking for help 1 **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

MONASH University

SOS Asking for help 1 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.

```r
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  ```
```

MONASH University

🆘 Asking for help 1️⃣ 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.

```r
```{r, fig.height = 3, fig.width = 3}
library(ggplot2)
ggplot(df, aes(weight, height)) +
  geom_point()

ggplot(df, aes(height, volume)) +
  geom_point()
```
```

MONASH University

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.

```r
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  ```
```

MONASH University

🆘 Asking for help 1️⃣ 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.

```r
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  ```
```

MONASH University

? How to ask questions?

MONASH University

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?

MONASH University

🆘 Asking for help ➊ 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

▼

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

☐ Is the problem clearly and succintly defined?

☐ Is the expected solution or behaviour outlined?

☐ Is the problem asked at the right place or person?

☐ Can people who can answer your question find your question?

☐ Can the problem be easily reproduced on other people's system?

☐ 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?

MONASH University

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

-1

```
        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
```

```
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 conjested can anyone help ???

The Overflow Blog

✎ The key comp
community

✎ Podcast 258:

Featured on Meta

0   R: How to pl
using a loop

0   How to plot a
error plots wi

Hot Network Qi

LNG How languages co
different syllables i

Ps Would mail in votin
Republicans?

MONASH University

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   📁   👣   💶              ─────────────────────────────────────────────
 hash: flag: Vatican City, foot: dark skin tone, euro banknote

 setting   value
 version   R version 4.1.2 (2021-11-01)
 os        macOS Big Sur 10.16
 system    x86_64, darwin17.0
 ui        X11
 language (EN)
 collate   en_AU.UTF-8
 ctype     en_AU.UTF-8
 tz        Australia/Melbourne
 date      2022-07-25
 pandoc    2.17.1.1 @ /Applications/RStudio.app/Contents/MacOS/quarto/bin/ (via rmarkdown)
```

MONASH University

🎁 Reproducible Example with `reprex` <small>LIVE DEMO</small>

- Copy your **minimum reproducible example** then run

```r
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.

MONASH University

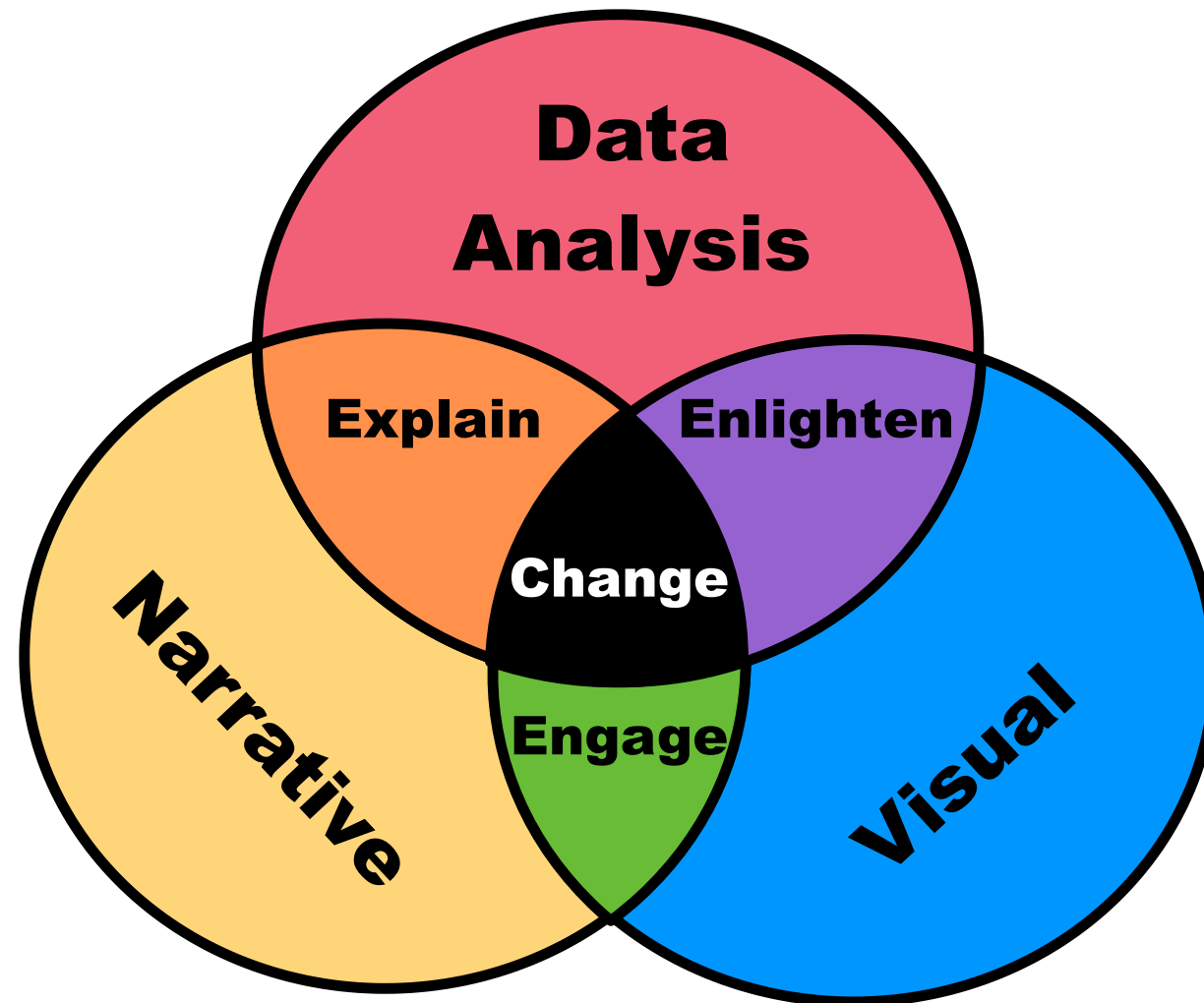# Communicating with Data

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

MONASH University

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

MONASH University

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

MONASH University