UNIVERSITY OF SÃO PAULO

[SCHOOL/DEPARTAMENT]

[GRADUATE PROGRAM]

Daniel Vartanian

{tesesusp}: a Quarto format for USP theses and dissertations

São Paulo

2023

Daniel Vartanian

{tesesusp}: a Quarto format for USP theses and dissertations

Original version

[DISSERTATION/THESIS] presented to the [SCHOOL/DEPARTMENT] at the University of São Paulo, as part of the requirements for the degree of [TYPE OF DEGREE] by the [GRADUATE PROGRAM].

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Co-Supervisor: Prof. Dr. [CO-SUPERVISOR'S FULL NAME]

São Paulo

2023

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ERRATA

This is the development version of the thesis (version <1.0.0). Any necessary corrections will be listed here after its approval.

[TYPE OF WORK] by [AUTHOR'S FULL NAME], under the title **{tesesusp}: a Quarto format for USP theses and dissertations**, presented to the [SCHOOL/DEPARTMENT] at the University of São Paulo, as part of the requirements for the degree of [TYPE OF DEGREE] by the [GRADUATE PRGRAM]), in the concentration area of [CONCEN-TRATION AREA].

Approved on _____ , _____ .

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Evaluation   _____

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To the worm that first gnawed on the cold flesh of my corpse,
I dedicate, as a fond remembrance, these posthumous memories.

Inscription found in the book
The Posthumous Memoirs of Brás Cubas by Machado de Assis (2014).

ACKNOWLEDGEMENTS

I would like to acknowledge this awesome [Quarto format](#)! :)

Nullius in verba

(The Royal Society, n.d.)

ABSTRACT

[SURNAME], [INITIALS]. ([YEAR]). *[TITLE]* [[TYPE OF THESIS]]. [SCHOOL/DEPARTMENT], University of São Paulo, São Paulo. [THESIS'S URL]

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Keywords: keyword 1. keyword 2. keyword 3.

RESUMO

[SOBRENOME], [INICIAIS]. ([ANO]). *[TÍTULO]* [[TIPO DE TESE/DISSERTAÇÃO]]. [ESCOLA/DEPARTAMENTO], Universidade de São Paulo, São Paulo. [URL DA DISSERTAÇÃO/TESE]

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Palavras-chaves: palavra-chave 1. palavra-chave 2. palavra-chave 3.

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LIST OF ABBREVIATIONS AND ACRONYMS

F

Subscript indicating a relation with work-free days.

W

Subscript indicating a relation with workdays.

MCTQ

Munich ChronoType Questionnaire.

MCTQ^{PT}

Portuguese version of the MCTQ.

MEQ

Morningness-Eveningness Questionnaire

MSF

Local time of mid-sleep on work-free days.

MSF$_{sc}$

Chronotype proxy. The midpoint between sleep onset and sleep end on work-free days. A sleep correction ($_{SC}$) is made when a possible sleep compensation related to a lack of sleep on workdays is identified.

MSW

Local time of mid-sleep on workdays.

LIST OF SYMBOLS

For an extensive list of chronobiology terms and definitions, please refer to Aschoff et al. (1965) and Marques & Oda (2012).

τ

Period of a rhythm in free flow; only revealed under constant environmental conditions.

T

Zeitgeber period.

ϕ

Phase

$\Delta\phi$

Phase shift

$+\Delta\phi$

Phase advance

$-\Delta\phi$

Phase delay

Ψ

Phase relation

LIST OF TERMS AND DEFINITIONS

For an extensive list of chronobiology terms and definitions, please refer to Aschoff et al. (1965) and Marques & Oda (2012).

Chronotype

Any kind of temporal phenotype (Ehret, 1974; Pittendrigh, 1993). Usually, it refers to circadian phenotypes in a spectrum that goes from morningness to evening-ness (Horne & Ostberg, 1976; Roenneberg et al., 2003). It can also be seen as an organism's phase of entrainment (Roenneberg et al., 2012).

Circadian rhythm

A rhythm with a period close to a day/24h, an approximation to the period of the earth's rotation (Pittendrigh, 1960). From the Latin *circā*, around, and *dĭes*, day (Latinitium, n.d.). Example: the sleep-wake cycle.

Complex system

There are several definitions. Here are some that I found to be of use:

- "Systems that don't yield to compact forms of representation or description." (David Krakauer apud Mitchell, 2013)
- "A system of many interacting parts where the system is more than just the sum of its parts" (Mark Newman apud Mitchell, 2013)
- Systems with many connected agents that interact and exhibit self-organization and emergence behavior, all without the need for a central controller (adapted from Camilo Rodrigues Neto's definition, supervisor of this thesis).
- Dialectics at its finest (my working definition).

Entrainment

A shift and alignment of biological rhythms induced by a zeitgeber input (Kuhlman et al., 2018). For example: a shift/alignment of an organism's circadian rhythm when exposed to light.

Infradian rhythm

A rhythm with a period greater than a day/24h. From the Latin *infrā*, below (think in terms of period repetition), and *dĭes*, day (Latinitium, n.d.). Example: the menstrual cycle.

Period

Cycle duration of an oscillation or, in a more technical way, the duration between two identical and consecutive phases in an oscillation (Kuhlman et al., 2018).

System theory

Two definitions can be of use:

- Science or discipline that investigates models, principles, and laws that are valid to systems in general (Bertalanffy, 1968).
- "The attempt of a reductionist scientific tradition to come to terms with complexity, nonlinearity, and change through sophisticated mathematical and computational techniques, *a groping toward a more dialectical understanding* that is held back by its philosophical biases and the institutional and economic contexts of its development." (Levins, 1998)

Ultradian rhythm

A rhythm with a period below a day/24h. From the Latin *ultrā*, beyond (think in terms of period repetition), and *dĭes*, day (Latinitium, n.d.). Example: the cardiac cycle.

Zeitgeber

Any periodic environmental signal/cue that can influence or regulate biological rhythms. From the German *zeit*, time, and *geber*, donor (Cambridge University Press, n.d.). Two main well known zeitgebers are light exposure and environment temperature (Pittendrigh, 1960).

Table of contents

1 INTRODUCTION

> **i** Note
>
> The text below is for demonstrative purposes only.
>
> See https://quarto.org/docs/authoring/markdown-basics.html to learn about the basics of Markdown's syntax.

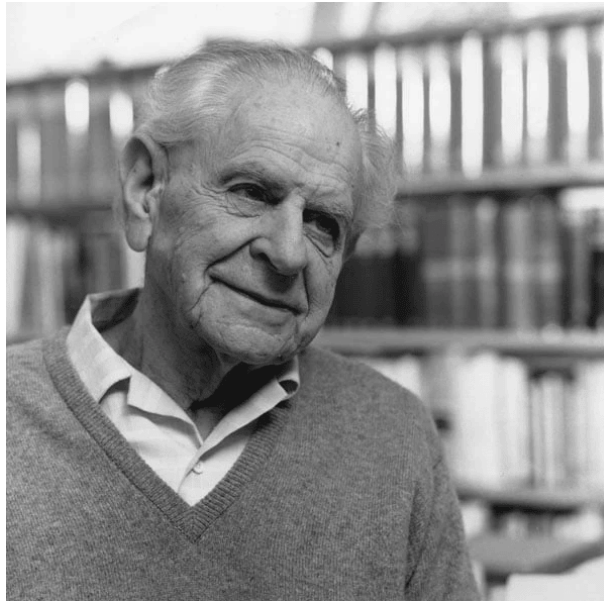"The activity can be represented by a *general schema of problem-solving by the method of imaginative conjectures and criticism*, or, as I have often called it, by *the method of conjecture and refutation*. The schema (in its simplest form) is this

$$P_1 \rightarrow TT \rightarrow EE \rightarrow P_2$$

Here P_1 is the *problem* from which we start, TT (the 'tentative theory') is the imaginative conjectural solution which we first reach, for example our first *tentative interpretation*. EE (*'error- elimination'*) consists of a severe critical examination of our conjecture, our tentative interpretation: it consists, for example, of the critical use of documentary evidence and, if we have at this early stage more than one conjecture at our disposal, it will also consist of a critical discussion and comparative evaluation of the competing conjectures. P_2 is the problem situation as it emerges from our first critical attempt to solve our problems. It leads up to our second attempt (*and so on*). A satisfactory understanding will be reached if the interpretation, the conjectural theory, finds support in the fact that it can throw new light on new problems — on more problems than we expected; or if it finds support in the fact that it explains many sub-problems, some of which were not seen to start with. Thus we may say that we can gauge the progress we have made by comparing P_1 with some of our later problems (P_n, say)."

(Popper 1979, 164)

Figure 1 – Karl Popper (July 25, 1902 – September 17, 1994).
One of the 20th century's most influential philosophers of science.

1.1   SECONDARY SECTION

```
1   # library(datasets)

2   # library(dplyr)

3

4   datasets::iris |>

5     dplyr::as_tibble() |>

6     dplyr::slice_sample(n = 5)
```

Table 1 – A sample of the famous (Fisher's or Anderson's) iris data set

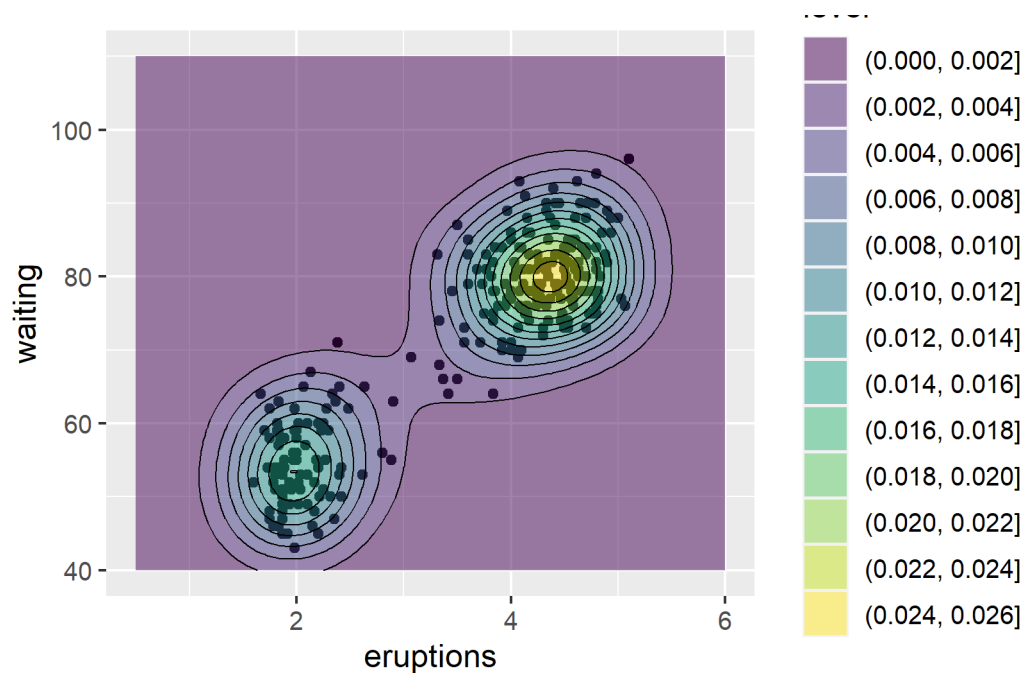| Sepal.Length	Sepal.Width	Petal.Length	Petal.Width	Species
6.5	3.0	5.5	1.8	virginica
6.5	3.0	5.8	2.2	virginica
5.0	3.0	1.6	0.2	setosa
5.0	3.5	1.6	0.6	setosa
6.2	2.9	4.3	1.3	versicolor

1.1.1 TERTIARY SECTION

```
1   # Example extracted from:
2   # <https://ggplot2.tidyverse.org/reference/geom_density_2d.html>.
3
4   # library(datasets)
5   library(ggplot2)
6
7   ggplot2::ggplot(faithful, aes(x = eruptions, y = waiting)) +
8     ggplot2::geom_point() +
9     ggplot2::xlim(0.5, 6) +
10    ggplot2::ylim(40, 110) +
11    geom_density_2d_filled(alpha = 0.5) +
12    geom_density_2d(linewidth = 0.25, colour = "black")
```

Figure 2 – Relations betwwen **waiting time to next eruption** (in minutes) and **eruption time** (in minutes) for the Old Faithful geyser in Yellowstone National Park, Wyoming, USA.

QUATERNARY SECTION

- Bullet point
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QUINARY SECTION

1. List
2. List
3. List

2 DEVELOPMENT

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3 CONCLUSION

> **!** Important
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[1] According to the APA style - American Psychological Association.

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A APPENDIX 1

> 💡 **Tip**
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