

A preamble about doing research that *sells*

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Being a researcher is challenging, especially in the beginning. Early Career Researchers (ECRs) need achievements to secure and expand their careers. In today's academic landscape, researchers are under many pressures: data collection costs, the expectation of novelty, analytical skill requirements, lengthy publishing process, and the overall competitiveness of the career. Innovative thinking and the ability to turn good ideas into good papers are the keys to success. While this book cannot replace other in-depth books by experts from related disciplines such as psychology and statistics, it offers a new approach for conducting research that may help with the issues mentioned above. More than just a method book, we provide the full description and explanation of mindsponge – a new perspective on the human mind's information processing mechanism, a framework with potential for further expansion and a wide range of applications.

Imaginary scenario 1: Real-life fairy tale?

You are in dire need to publish your new study for whatever reasons, and the deadline is creeping closer. You have very limited experience, including in statistics. You currently have no money left except just enough to buy this analytics book. After buying and reading the book, you download an open dataset, choose five variables, create a simple model, conduct analyses, and start writing the manuscript. After only four months, your paper is published in a high-quality journal after one easy round of peer-review, where people seem to like your innovative way of thinking and impressive statistical analysis.

Value 1: We will help you explore how to conduct studies with limited resources without neglecting quality.

ECRs are limited in experience and resources, particularly those from low- and middle-income countries. One of my mentees was a typical ECR. She is a young girl in her early 20s, and at this moment, she is currently studying for her first master's degree in Vietnam. But she already is the lead author of an article (1) published in the journal *Ambio* – the official publication of the Royal Swedish Academy of Sciences (the organization that awards Nobel Prizes). It is worth noting that this is a study using secondary data with a very low total monetary cost. And she achieved such an impressive feat thanks to the innovative thinking power of the mindsponge and the analytical strength of Bayesian analysis. Additionally, ECRs may want to adopt the entrepreneur mindset, focusing on innovation while keeping a low cost. Speaking from experience, we have published many studies across various disciplines using free data from the Internet. Researchers can push their curiosity and creativity further with fewer technical and financial constraints.

Imaginary scenario 2: Hard-to-swallow pill?

A mysterious man presents to you a blue pill and a red pill. You are asked to choose between two options: either formulating super complicated models that nobody really understands and getting rejected anyway after several long years of waiting with countless cycles of back-and-forth revision (the blue pill); or creating a simple model but useful and getting accepted for publication after a few months of a smooth reviewing process (the red pill). You see that many people chose the former option. You feel glad having read this book and go for the latter option.

Value 2: We will show you how to construct impactful parsimonious models, which may increase your paper's likelihood of being accepted for publication.

Besides ECR, the approach and method provided in this book also help researchers advance their careers and develop their own theories. Several of our fellow researchers, who recently decided to adopt mindsponge thinking and Bayesian analytics, found the method much easier to use than they had imagined. And with the new tools, they successfully published their studies after only a short period (2, 3). Bayesian statistics may seem intimidating at first, but we have tried our best to make sure that, with this book, you can immediately try using the software and produce some interesting results while following along with the provided examples and explanations.

Instead of trying to build unnecessarily complicated models, this book follows our philosophy about parsimonious models, expressed through our educational approach: easy to understand and straightforward to execute. We think that parsimonious models increase predictability while easing the burden of technicality. And we believe that a good study should be useful, simple, and beautiful.

Imaginary scenario 3: Eye of the tiger?

You had always kept asking yourself what the scariest comments from reviewers would be – maybe about a concept you do not clearly understand or a technical mistake that can make you redo the whole analysis. One day, you met some strange scientists who told you they usually wonder what aspects of their studies the reviewers would find the scariest – maybe the feeling of being unable to accurately assess the analysis or the sheer overwhelming “mass” of novel ideas. They kindly showed you their little “secret”: this book.

Value 3: We will help you understand clearly the mindsponge information processing mechanism of the human mind and the Bayesian analytical approach, increasing your persuasiveness and confidence in the peer-reviewing process.

Mindsponge is the conceptual framework of a new perspective on the human mind's information processing mechanism. Its flexibility helps researchers create novel ideas, conceptualize innovative studies, and formulate their very own theories. In this book, we present the mindsponge framework as a tool to support researchers in constructing models that can be used in both qualitative and quantitative investigations. One does not necessarily need costly data to conduct impactful conceptual research with mindsponge thinking. For example, through an almost zero-cost research process, we published a theoretical article in the journal *Humanities and Social Sciences Communications* (*HSSC*, formerly known as *Palgrave Communications*) (4). Many sections across the book discuss the use of mindsponge thinking for conceptual and qualitative research.

The strength of the Bayesian approach in statistical analysis comes from its philosophy in alignment with human thinking, such as belief updating and assessing things probabilistically. The Bayesian approach is also cost-effective as it works well with small data samples. While there are many Bayesian analysis software packages, in our examples, we use our home-grown **bayesvl** package (5). On May 24, 2019, we officially released **bayesvl** 0.8.5 on *The Comprehensive R Archive Network* (*CRAN*) as the first and only package from Vietnam back then, in an environment of very limited theoretical and technical support. After three years of continuous improvements, version 1.0 was released on Github on May 18, 2022. So far, the package has been validated through more than 30 studies published in hard-to-please journals, such as *HSSC* (Nature Portfolio) (6, 7), *Research Evaluation* (Oxford University Press) (8), *Learned Publishing* (Association of Learned and Professional Society Publishers) (9), and *Pacific Conservation Biology* (CSIRO Publishing) (10), and persuading demanding editors and reviewers. We hope to walk the audience through the mathematics and computer code challenges with

educational purposes in mind and clearly-presented step-by-step procedures, and prepare our readers to leave their comfort zone.

Imaginary scenario 4: Have your cake and eat it too?

Sadly, people say that most adults have to “tone down” their curiosity and creativity to earn a living in today’s competitive society. Growing up, getting older, working in academia, and seeing its various faces, many of your friends started to think this may be the unfortunate truth of life. To reach those key performance indicators (KPIs), one needs to compromise, right? Luckily, after reading this book, you have found your own way to become able to well-exceed the usual KPI expectations while freely exploring new topics, experimenting with new approaches, and even developing your very own theories.

Value 4: With the ability to produce good research at a low cost, you can have more freedom of thought, and at the same time, you may be able to earn a better living by thinking freely.

The problem-solving power increases when the mindsponge and the Bayesian method combine into the Bayesian-Mindsponge Framework (BMF). With a well-established and low-cost research protocol from conceptualization to analysis and manuscript writing, you can have more energy to expand the boundaries of your thinking, which is especially fitting for ECRs whose only weapons are their thinking ability and immense stamina. I assume that patience is an apparent quality for success. Still, it is much better to spend your years of effort with freedom of thought in good financial condition.

Another major point regarding the BMF is aesthetics. Doing science should be like creating art. You want your studies to be referred to as beautiful paintings and melodies rather than dry walls of text. The mindsponge mechanism and Bayesian analysis give you an enhanced visualization power. Graphics capabilities help illustrate the flowing

thoughts, facilitate novel ideas, and create a dance with your mind that may lead to interesting and unexpected results.

Real experience, true intention!

Throughout this book, we tell stories of our struggles on the journey of developing our thinking and method. There are no pre-laid carpets for the pioneers but real sweat and labor. There were sleepless nights lost in clashing thoughts when constructing models and interpreting results and harsh battles upon harsher battles when submitting manuscripts and trying to hold our ground before strict editors and reviewers. We understand your struggles because we have been through them all, and that is why we share with you the insights from our direct experiences of using mindsponge and the BMF. Apart from publishing over one hundred academic papers, I have edited over 110 manuscripts and written over 300 peer-review reports (11), so I understand the difficulty of both performing good research and getting good research published. Other authors of this book have also experienced the publishing journey to varying extents. Thus, we have had many intense debates on how to write this book in the best way possible for readers to grasp the content and overcome the anticipated struggles.

Value 5: We provide in this book the kind of information that you may not find in a normal analytics book – common problems in employing the method during the publishing process and solutions that we found effective.

This book will give you the tools that help you create the condition where you can expand your thinking and produce works that are more likely to be highly appreciated by the community. In other words, you will be able to do research that sells!

For that purpose, the book has three main sections. The first part introduces the concept of the mindsponge, its components and functions, as well as examples of mindsponge thinking through investigating the suicidal mind and the mechanism of trust. The

second part focuses on the BMF analytics and the technical aspect of Bayesian analysis, with clearly explained concepts, step-by-step procedures alongside published studies as examples, and easy-to-follow codes and interpretations. The third part presents an example of expanding the application of mindsponge-based innovative thinking: a theoretical investigation into the information process of dictatorship. This final part also reflects on the book's content and suggests some further directions for how you may use mindsponge and the BMF in the future.

In addition to the book, my team and I will also set up and maintain a website, <https://mindsponge.info>, where we provide more content related to the mindsponge mechanism and BMF analytics, and welcome inquiries about your research ideas and statistical investigations.

Finally, I want to say that any technique will someday, sooner or later, be replaced by something better. But the power of innovative thinking that you struggle today to gain and master will be useful for many more years.

Hanoi, Vietnam

June 6, 2022

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