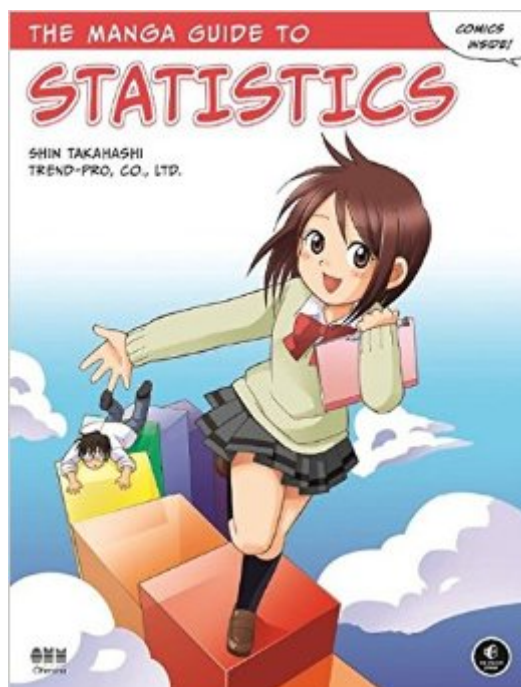


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# The Manga Guide To Statistics



## Synopsis

Think you can't have fun learning statistics? Think again. The Manga Guide to Statistics will teach you everything you need to know about this essential discipline, while entertaining you at the same time. With its unique combination of Japanese-style comics called manga and serious educational content, the EduManga format is already a hit in Japan. In The Manga Guide to Statistics, our heroine Rui is determined to learn about statistics to impress the dreamy Mr. Igarashi and begs her father for a tutor. Soon she's spending her Saturdays with geeky, bespectacled Mr. Yamamoto, who patiently teaches her all about the fundamentals of statistics: topics like data categorization, averages, graphing, and standard deviation. After all her studying, Rui is confident in her knowledge of statistics, including complex concepts like probability, coefficients of correlation, hypothesis tests, and tests of independence. But is it enough to impress her dream guy? Or maybe there's someone better, right in front of her? Reluctant statistics students of all ages will enjoy learning along with Rui in this charming, easy-to-read guide, which uses real-world examples like teen magazine quizzes, bowling games, test scores, and ramen noodle prices. Examples, exercises, and answer keys help you follow along and check your work. An appendix showing how to perform statistics calculations in Microsoft Excel makes it easy to put Rui's lessons into practice. This EduManga book is a translation from a bestselling series in Japan, co-published with Ohmsha, Ltd. of Tokyo, Japan.

## Book Information

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## Customer Reviews

I loved "The Cartoon Guide to Statistics" because it was humorous very simply told and yet accurately taught. Some of the material is so good that I now use it in my introductory biostatistics course. The Manga Guide to Statistics does similar things but a little differently. This book is in cartoon strip form and the characters are familiar to many kids who these days watch the Japanese cartoons on television and read the comic books. This includes my son Daniel who is a high school junior. Dan hates to read but loves math and science and this is the first statistics book that intrigued him enough to read it! I know he is reading it and enjoying learning from it by the questions he asks. So like the other cartoon book on statistics this too is a gentle introduction for those with math skills and those with an aversion to mathematics. It shows how statistics is practical by illustrating the techniques on everyday real world data, such as the scores of bowling team players at a bowling alley. It covers the basic summary statistics, correlation, hypothesis testing and probability distributions. What I found interesting was that in addition to the ordinary Pearson product moment correlation they also provided intra-class correlation and Cramer's V (for categorical data). These methods are rarely covered in elementary texts. One thing it has that is missing in "The Cartoon Guide to Statistics" is the teaching of how to use the computer to apply what they learn. In the final chapter they do this using Excel and teaching things step by step using screen shots of excel spreadsheets. Throughout the book when a new statistic is introduced they go through the step by step details of the calculations. This is something that students do not necessarily need to learn in the age of computers and statistical computer packages. However, going through the tedium of the calculations has a way of reinforcing the concepts and it gives the student a better understanding of exactly what a variance and a standard deviation are. I recommend this book for high school students to supplement what they learn in class or for independent self-learning. College students with weak math backgrounds who need an introduction to statistics may also find this book useful and interesting. It is working wonders for Dan who now wants to get the soon to be published Manga guides to physics, calculus, microbiology and databases! Unfortunately this one is the first to come out and the others won't appear until later in 2009.

Since I enjoyed the Manga Guide to Statistics, I guess the author achieved at least one objective of good teaching - keep the learner interested. The use of well thought out graphics and humorous examples are likely to encourage a learner to attend to the content. Still, maintaining interest and good teaching, while related, are not identical. One can maintain interest in ways that detract from learning as well as in ways that enhance learning. The tendency in this text to oversimplify (e.g., the

discussion of what is and is not "measurable" at the beginning of the book, the underemphasis of the importance of random selection) are definite negatives. They will lead a learner with no background in the use of statistical procedures to mistaken conclusions about the meaning of measurements and the generalizability of findings. In at least one case, the oversimplification proceeds to the point of presenting information that is wrong (i.e., the examples of alternative hypotheses on pp. 172-173). To be fair, there are many "gentle" statistics texts that, as does the Manga Guide to Statistics, present the notion that the alternative hypothesis is simply "not the null hypothesis." Despite the popularity of this view, Neyman and Pearson (who developed statistical hypothesis testing theory 75 years ago) noted that the "not the null" formulation of the alternative hypothesis would lead to the acceptance of trivial effects as meaningful simply because they were "statistically significant." The "not the null" formulation of the alternative hypothesis creates other problems. For example, the null hypothesis on page 173, "The allowances of high school girls in Tokyo and Osaka are the same," has as its alternative, "The allowances of high school girls in Tokyo and Osaka are not the same." Stating the alternative hypothesis in this way does not permit an evaluation of the power of a statistical test (power refers to the probability that a test will detect a difference, change or relationship when it is present). As Neyman noted, since the test would have to detect an infinitesimal difference, the power would necessarily be infinitesimal as well. Instead, an alternative hypothesis should specify a minimum effect, e.g., "The allowances of high school girls in Tokyo and Osaka differ by an average amount of at least  $\text{¥}500$ ." By specifying a minimum effect to be detected, we can find the probability that a statistical hypothesis test would detect a difference of at least  $\text{¥}500$  (the test's power). Since I have to devote time to "unteaching" the "not the null" formulation of the alternative hypothesis, I am far from thrilled to see it here. Convincing learners that the easily understood "not the null" definition is wrong usually requires a lot of work and pain. After all, who likes being told that what they thought they understood, is what they still do not understand? This makes it more difficult for me to help my students understand the central importance of power to statistical testing. And, as Neyman pointed out, the power of a test is the main determinant of how useful it is. It may seem that I am asking too much of an introductory text. I do not think so. It is my experience that one must engage in some fairly sophisticated reasoning to understand the meaning of the results of a statistical analysis. The simple, obvious interpretation is almost always wrong (cf., Darrell Huff's *How to lie with statistics*). We do a learner no favors by simplifying a complex process to the point where we deceive the learner into thinking that they understand something that they do not. The trick (which I am still working on mastering) is to help learners learn how to enjoy the challenge of minimizing, but still living with, uncertainty (an important

element of all statistical reasoning) and also to help them learn to be suspicious of "easy" answers. I recently got around to reading W. Edwards Deming's book, *Out of the Crisis*. In it, he made an observation about maintaining learner interest and quality teaching that is relevant to this book: "In my experience, I have seen a teacher hold a hundred and fifty students spellbound, teaching what is wrong." The *Manga Guide to Statistics* held my interest from the moment I started reading it. In fact, I read it in one sitting. I honestly enjoyed reading it, but it is wrong in too many places. I purchased the *Manga Guide to Statistics* thinking that I might use it in my introductory research methods courses. I shall not use it. I shall not recommend it. I shall not mention it. Note: I apologize for the lengthy discussion of the alternative hypothesis. I am afraid that I am not clever enough to find another way to demonstrate the problem of oversimplification.

Deming, W.E. (1986). *Out of the Crisis*. Cambridge, MA: MIT Center for Advanced Engineering Study.

Huff, D. (1954). *How to Lie with Statistics*. NY: Norton.

Neyman, J. & Pearson, E. (1933). On the problem of the most efficient tests of statistical hypotheses. *Philosophical Transactions of the Royal Society of London. Series A, Mathematical and Physical Sciences*, 231, 289-337.

I don't know where to start. This is the best statistics book. Ever. I never thought I'd say this, but the authors have made a book on statistics FUN without dumbing it down (this effectively covers at least the entirety of a college level stat intro class). As a student, this cleared up many problems I'd been having operationalizing fairly advanced formula within Excel. The chapter on inputting statistical formulae in Excel is amazing and worth the cost of the book in itself. The explanations of the formulas use concrete, real world examples. No gambling examples or other unnecessarily abstract or standard scenarios. As a teacher, I bow down to Mr. Takahashi and the folks at Trend-pro. Their pedagogical expertise is unparalleled. I can only hope that one day I am 1/10th the teacher this man is. He made statistics, a fairly dry subject, not just palatable, but entertaining. Arigato.

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