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Preface

This book had its origins in what felt at the time like the most arduous point of my design career, while I was working on a very challenging client project. From the beginning, there were several indications that it would be an exciting, albeit difficult, project: a relatively short timeline and a somewhat unfamiliar space, but a well-known brand and the chance to help design something that'd be seen by many across the world. These kinds of projects have always been my favorite because they are the ones that offer the most opportunity to learn and grow, which I've always striven to do. But this project was somewhat unique in one specific way: I was being asked to justify a number of design decisions to project stakeholders, without any data to support them. Normally, when you have quantitative or qualitative data available to draw upon, this is a pretty straightforward task—but in this case the data wasn't available, so the process of justifying the decisions would have to be a little different. How do you validate initial designs without any proof that there is a need to change the existing designs to begin with? As you can imagine, design reviews quickly became a matter of subjectivity and personal bias, resulting in designs that were more difficult to validate.

Then it occurred to me: psychology, which provides a deeper understanding of the human mind, could be helpful in these circumstances. I quickly became immersed in the rich and expansive field of behavioral and cognitive psychology, and found myself reading through countless research papers and articles in order to find empirical evidence that supported the design decisions I was making. This research became quite useful in convincing project stakeholders to move in the proposed design direction, and I felt as if I had found a treasure trove of knowledge that would ultimately make me a better designer. There was only one problem: finding good reference material online quickly turned into an exhausting task. Searches led me to a vast array of academic papers, scientific research, and the occasional article in the popular press—none of which felt

directly relatable to my work as a designer. I was looking for a designer-friendly resource that just wasn't available online, or at least not in the form I wanted it. Eventually I decided to dive in and produce the resource I was looking for myself, resulting in the creation of a website called Laws of UX (Figure P-1). This passion project became a way for me to both learn and document what I was discovering at this time.

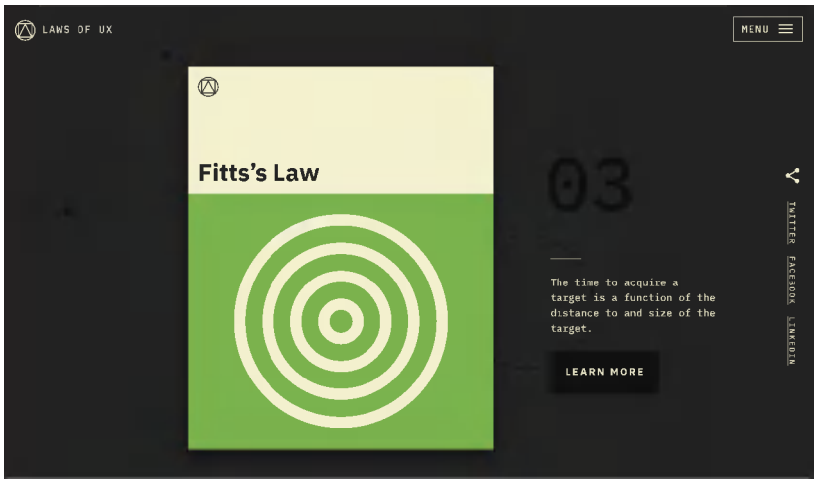

Figure P-1. Screenshot of the Laws of UX website, circa 2020

The absence of quantitative or qualitative data related to the project I was working on led me to look elsewhere, and what I discovered regarding the intersection of psychology and user experience (UX) design has been nothing short of transformative for my practice. While such data, where available, remains valuable, my foray into psychology helped form a solid foundation for my work grounded in an understanding of how people behave, and why. This book is an expansion of the Laws of UX website that focuses on various psychological principles and concepts that I've found particularly useful as a designer. It's important to note they are not actual laws intended to be strictly followed—rather, it's helpful to think of them as guidelines that help inform design decisions based on patterns of human behavior that've been observed time and time again. They're not a replacement for user research, but they can be incredibly valuable for interpreting why people behave a certain way in general.

Second Edition

The craft of design has a dynamic nature that keeps evolving along with technology. With every new technological advancement, new constraints and possibilities are introduced. Since the first edition of this book, LLMs (Large Language Models) have undergone significant advancements, AI-powered image generation tools have emerged, spatial computing has entered the mainstream, and smartphones have become even more powerful. However, the principles and concepts covered in this book remain timeless, and they provide a solid foundation for every designer, regardless of their level of expertise. To enhance the reader's experience, the second edition includes additional information linking these principles and concepts to psychology concepts, techniques, and key considerations. This edition also features updated examples throughout, making it a practical guide for designers who want to stay up to date with the latest trends and best practices in the field of design.

Why I Wrote This Book

I wrote this book in order to make complex laws of psychology accessible to more designers—specifically designers who don't have background knowledge in psychology or behavioral science. The intersection of psychology and UX design has become an increasingly relevant topic in an era when design roles are having an ever-stronger impact within organizations. Along with a growing focus on design, there has been an increase in debate around which additional skills designers should learn, if any, to increase their value and contribution. Should designers code, write, or understand business? Any of these skills could be valuable depending on the project, team, and industry. However, I would argue that every designer should learn the fundamentals of psychology.

As humans, we have an underlying "blueprint" for how we perceive and process the world around us, and the study of psychology helps us decipher this blueprint. Designers can use this knowledge to build more intuitive, human-centered products and experiences. Instead of forcing users to adapt to the design of a product or experience, we can use some key principles from psychology as a guide for designing in a way that is adapted to people. This is the fundamental basis of human-centered design, and it's the foundation of this book.

But knowing where to start can be a challenge. Which principles from psychology are useful? What are some examples of these principles at work? There's an endless list of laws and theories that occupy this space, but there are a few that I've found particularly helpful and widely applicable. In this book, I explore these concepts and present some examples of how they are effectively leveraged by products and experiences we interact with every day.

Who This Book Is For

This book is for anyone who wishes to improve their design craft, learn more about the intersection of psychology and design, or simply explore why people react to good design the way they do. It's aimed at designers who want to have a better understanding of psychology and how it impacts and overlaps with the work we do. It's for professional and aspiring designers alike: anyone who seeks to understand how the overall user experience is affected by an understanding of human perception and mental processes. While the book is specifically focused on digital design as opposed to the more traditional media of graphic or industrial design, the information it contains is broadly applicable to anyone responsible for shaping user experience. I should also mention that it isn't intended to be a comprehensive resource, but rather an accessible introduction to the psychology fundamentals that have a direct influence on design and how people process and interact with the interfaces we create. It's full of examples and intended to be easily read and referenced by designers who wish to incorporate this information into their daily work.

This book will also be relevant to anyone who seeks to understand the business value of good design and why good design is transformative for businesses and organizations. The field of UX design has grown and expanded into new areas thanks to the increase in investment by companies looking to gain a competitive advantage. With this new interest has come the expectation that products and services should be well designed, and simply having a website or mobile application is no longer enough. Companies must ensure their websites and applications, and any other digital experiences they offer, are helpful, effective, and well designed. In order to achieve this goal, designers can, I believe, use psychology as a guide, enabling them to design for how people actually perceive, process, and interact, not only with digital interfaces but also with the world.

What's in This Book

Chapter 1, "Jakob's Law"

Users spend most of their time on other sites, and they prefer your site to work the same way as all the other sites they already know.

Chapter 2, "Fitts's Law"

The time to acquire a target is a function of the distance to and size of the target.

Chapter 3, "Miller's Law"

The average person can keep only 7 (± 2) items in their working memory.

Chapter 4, "Hick's Law"

The time it takes to make a decision increases with the number and complexity of choices available.

Chapter 5, "Postel's Law"

Be conservative in what you do, be liberal in what you accept from others.

Chapter 6, "Peak–End Rule"

People judge an experience largely based on how they felt at its peak and at its end, rather than on the total sum or average of every moment of the experience.

Chapter 7, "Aesthetic–Usability Effect"

Users often perceive aesthetically pleasing design as design that's more usable.

Chapter 8, "Von Restorff Effect"

When multiple similar objects are present, the one that differs from the rest is most likely to be remembered.

Chapter 9, "Tesler's Law"

Tesler's law, also known as the law of conservation and complexity, states that for any system there is a certain amount of complexity that cannot be reduced.

Chapter 10, "Doherty Threshold"

Productivity soars when a computer and its users interact at a pace (<400 ms) that ensures that neither has to wait on the other.

Chapter 11, "Applying Psychological Principles in Design"

This chapter considers ways designers can internalize and apply the psychological principles we've looked at in this book and then articulate them through principles that relate back to the goals and priorities of their team.

Chapter 12, "With Power Comes Responsibility"

Here, we take a closer look at the implications of using psychology to create more intuitive products and experiences.

A Brief History of Psychology and Design

A little context can make a big difference, so I would like to begin this book by providing some history on the overlap between psychology and design. My intention is not to provide a comprehensive account but rather to offer a brief introduction that will enhance the upcoming chapters and place them in a historical context.

GESTALT PSYCHOLOGY

We'll begin with Gestalt psychology, which is a psychological perspective that emerged in the early 20th century. It emphasized the idea that human perception and understanding of the world are not simply the sum of individual sensory experiences but rather a meaningful whole. Gestalt psychology pioneers such as Max Wertheimer, Kurt Koffka, and Wolfgang Köhler believed that individuals perceive and interpret stimuli by organizing them into patterns and structures, rather than perceiving them as isolated elements. They studied how individuals perceive visual illusions, problem solving, and the organization of sensory information. The principles of Gestalt psychology, such as the figure–ground relationship, similarity, proximity, and closure, continue to be influential in the field of design.

HUMAN FACTORS ENGINEERING

Psychology has played a crucial role in our understanding of the interaction between humans and machines. It was psychologists who established human factors engineering, a discipline that focused on designing tools, machines, and systems that take into account human capabilities, limitations, and characteristics. During World War II, the discipline gained significant momentum as the US military recognized the importance of optimizing equipment and cockpit interfaces for aircraft. Psychologists Paul Fitts and Alphonse Chapanis observed that humans are prone to errors, particularly when under stress, regardless of

their training.[1] They also recognized that machines could be designed to align with human capabilities and limitations, thereby reducing these errors. This insight led to the development of principles that became fundamental to the discipline. After World War II, human factors engineering principles were applied and developed in the aviation industry to enhance safety and efficiency through studies on pilot performance, cockpit design, and human–machine interactions.

HUMAN–COMPUTER INTERACTION

Psychology has also played a fundamental role in shaping the development of computers and how we interact with them. The combination of psychology, systems analysis, and computer science became a defining characteristic of research institutes during the Cold War era, much of which was linked to the defense establishment and large mainframe computers. In these early years of computer science, computers were primarily engineered rather than designed, which meant that users had to adapt to how these computers operated. The concept of personal computing was still a distant dream that only a few dared to imagine, most notably Douglas Engelbart in his work at the Stanford Research Institute (resulting in the computer mouse, the development of hypertext, networked computers, and precursors to graphical user interfaces, to name a few outcomes).

Advancements in technology led to a recognition of the importance of designing systems that catered to human cognitive and physical abilities. Engineers started focusing on computer users and began developing new input methods and exploring different applications for the machines. It was during this period that the notion of ubiquitous computing would start taking shape at the Xerox Palo Alto Research Center (PARC), which explored how small and inexpensive internet-connected computers could help with everyday functions in an automated fashion. Founded in 1970 with the goal of inventing "the office of the future," Xerox PARC gave birth to numerous innovations, including laser printing, desktop computing, Ethernet, and natural language processing. A pivotal moment in the integration of psychology and computer science came from Xerox PARC with the publication of *The Psychology of Human–Computer Interaction* (CRC Press) in 1983 by Stuart K. Card, Thomas P. Moran, and Allen Newell, which had a profound impact on the development of personal computing, as they applied cognitive psychology to enhance human interaction with computers.

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1 Cliff Kuang and Robert Fabricant, *User Friendly: How the Hidden Rules of Design Are Changing the Way We Live, Work, and Play* (New York: MCD/Farrar, Straus and Giroux, 2019), 86.

Another significant contribution from Xerox PARC was Smalltalk, an object-oriented programming language that enabled easy manipulation of multiple windows, mimicking the way people organize physical documents on a desk. Smalltalk established the metaphorical desktop that would become a mental model for future operating systems and was used in the development of the first graphical user interface (GUI). Alan Kay played a crucial role in the development of Smalltalk and in shifting the paradigm from a text-based office information system to a personal multimedia communication device.

Kay's inspiration for how we could interact with computers came from his visit to Seymour Papert's Logo project at MIT's Artificial Intelligence Laboratory. Papert had spent five years working with Jean Piaget, a psychologist who studied the ways in which children learn, and was inspired to create the educational programming language with the goal of teaching children concepts in mathematics and computer programming. It was Papert's Logo project that convinced Kay that computer programming languages should be developed on a level that children could understand and use. Another significant influence on Kay was the work of psychologist Jerome Bruner, who studied different learning mentalities in children.

USER EXPERIENCE DESIGN

User experience (UX) design emerged from the field of human–computer interaction (HCI) alongside the rise of the World Wide Web and the need for better interaction design. One of the key figures in the early development of UX design is cognitive scientist and psychologist Donald Norman, who began his career as part of a committee tasked with investigating the Three Mile Island nuclear disaster in 1979. Norman would later coin the term "user experience" to encompass all aspects of the end user's interaction with a system, including the interface, graphics, industrial design, physical interaction, and more, while at Apple. He emphasized the importance of designing products that not only are functional but also provide a positive and satisfying experience for the user.

Another influential figure who played a key role in shaping our understanding of design and its impact on user experience is Jane Fulton Suri, best known for pioneering the practice of human-centered design (HCD) at the renowned company IDEO. With a unique educational background in psychology and architecture, Suri's approach integrated ethnographic research, observation techniques, and cross-disciplinary collaboration into a blended approach to gain deep insights into user behaviors and needs. Her work has helped shape UX design into a discipline that deeply considers the human experience at its core.

Psychology continues to inform how we can design systems that align with how people actually are, rather than how we want them to be. While technology and our interactions with it will keep evolving, psychology offers a lens to decipher the fundamental "blueprint" of how we perceive and process the world. Armed with this understanding, designers can create more intuitive and user-centered products and experiences by shaping the technology to fit the user, rather than the other way around.

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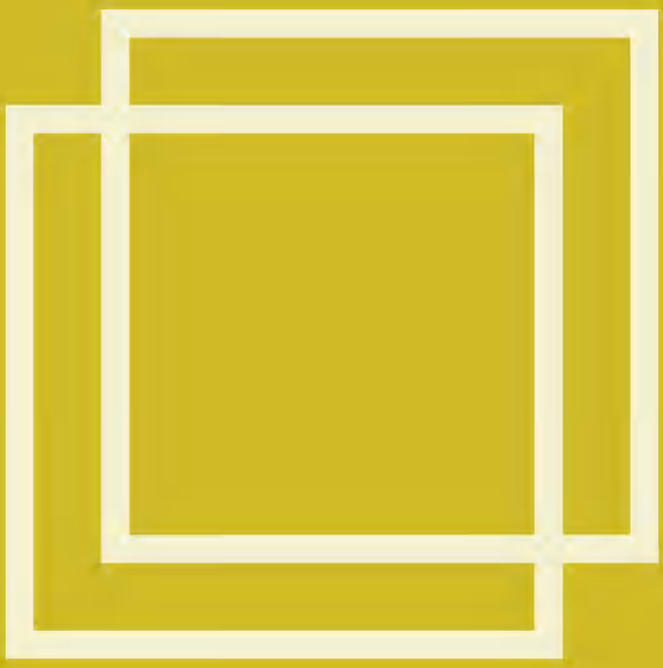
Acknowledgments

This book is dedicated to my mom, Charlotte Rollins, the strongest person I've ever known and the one who encouraged, supported, and enabled me to follow my dreams to begin with. I'd like to also acknowledge and thank my wife Kristen, whose love and support have been both endless and critical in so many ways—without her this book would not have been possible. I must acknowledge James Rollins, a man I'm forever grateful to have in my life and in the lives of my family. I'd like to also acknowledge my design colleagues who helped with the book in some way or another: in no particular order, Jonathan Patterson and Ross Legacy for always-on-point design advice and feedback; Xtian Miller for the encouragement, feedback, and words of wisdom; and Jim and Lindsey Rampton, Dave Thackery, Mark Michael Koscierzynski, Amy Stoddard, Boris Crowther, Trevor Anulewicz, Clemens Conrad, and countless others for their support and encouragement. I also owe a debt of gratitude to all the individuals involved in the project that inspired this book and who therefore directly influenced its creation. I'd like to thank Jessica Haberman, who saw the potential in me to become an author and encouraged me to begin the endeavor of writing this book. And finally, I owe Angela Rufino a great deal of gratitude for all of her advice, patience, and feedback throughout the process.



Jakob's Law

Users spend most of their time on other sites, and they prefer your site to work the same way as all the other sites they already know.

Key Takeaways

- Users will transfer expectations they have built around one familiar product to another that appears similar.
- By leveraging existing mental models, we can create superior user experiences in which the users can focus on their tasks rather than on learning new models.
- When making changes, minimize mental model mismatches by empowering users to continue using a familiar version for a limited time.

Overview

There is something incredibly valuable to be found in familiarity. Familiarity helps the people interacting with a digital product or service know immediately how to use it, from interacting with the navigation to finding the content they need to processing the layout and visual cues on the page in order to understand the choices available to them. The cumulative effect of mental effort saved ensures a lower cognitive load. In other words, the less mental energy users have to spend learning an interface, the more they can dedicate to achieving their