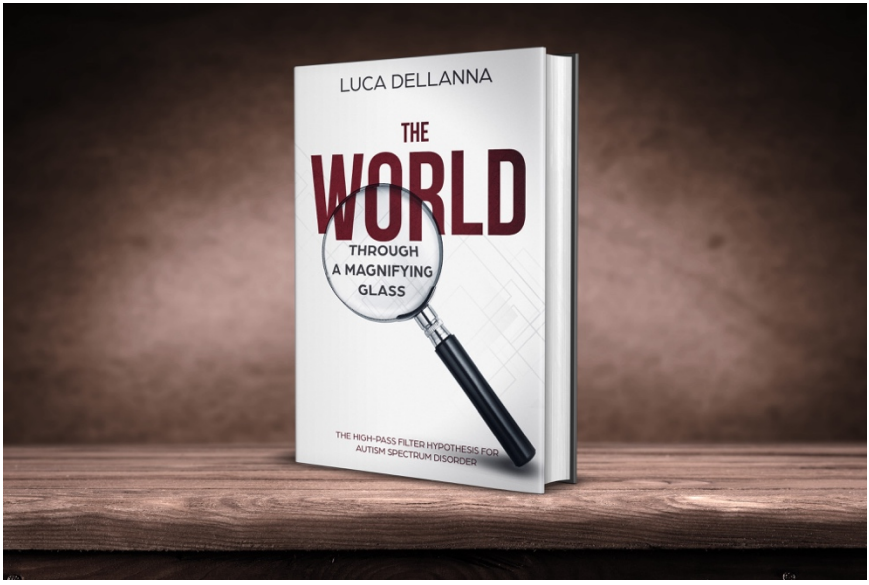
The World Through a Magnifying Glass

The High-Pass Filter Hypothesis for Autism Spectrum Disorder



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Excerpt – April 2020

ALSO BY LUCA DELLANNA:

The Control Heuristic

The World Through a Magnifying Glass

100 Truths You Will Learn Too Late

Best Practices for Operational Excellence

ADVANCE PRAISE

"Thanks to Luca Dellanna for his book about autism and ASD. It's probably one of the best works I have read in that matter (I have read a few) and it's surprising how realistically he depicts the condition."
– *Manel Vilar, a reader*

"Thank you for helping me understand! My son was recently diagnosed and I needed to be able to understand how he views the world. Why certain things would overwhelm him and cause so much anxiety and pain. This book made it so clear and easy to understand."
– *Geiger T., a reader*

"Loved The World Through a Magnifying Glass – this analogy NAILS IT."
– *Emerson Spartz, NYT Bestseller Author*

INTRODUCTION

AUTISM SPECTRUM DISORDER

Autism Spectrum Disorder (ASD) is the term used for a group of developmental disorders. It encompasses a wide range (the Spectrum) of symptoms, skills, and levels of disability, including what is commonly referred to as Asperger's syndrome.

To get a comprehensive idea of what this disorder entails, a few symptoms or behaviors, which tend to manifest more frequently or intensely in the case of the people at the far end of the Spectrum, have been provided below:

- Introversion
- Excessive focus on details (Weak Central Coherence)
- Abnormal gait or lack of motor coordination
- Monotonic voice
- Abnormal, deficient, or inappropriate eye contact, body language, and facial expressivity
- Difficulty in understanding one's, or other people's, emotional state
- Repetitive behavior
- Over- or under-sensitivity to sensorial stimuli

The aforementioned list includes only a handful of the behaviors that might be observed in the case of the individuals on the Autism Spectrum. It also includes behaviors that can also be observed in those who are not on it (the Neurotypicals) but that appear more often and/or with greater intensity in those who are on the Spectrum, in relation to their position on it.

BOOK STRUCTURE

This book comprises four parts. In the first one, "The World Through A Magnifying Glass", I explain, in an extremely practical and visual manner, how the people on the Spectrum perceive the world.

In the second part, "Living with the Magnifying Glass" I explain how their different manner of perceiving the world causes the symptoms typical of Autism Spectrum Disorder.

Subsequently, in the third part, "Learning and Teaching", I explain the reason, in many fields, Autism Spectrum Disorder is considered to be a learning disability, and I propose a few ways in which such disability might be mitigated.

In the last part of the book, "The High Pass Filter Hypothesis", I present my theory concerning an atypical modulation of perceptual signals, similar to the ones caused by an electronic high-pass filter, which leads to Autism Spectrum Disorder. This last section is highly technical and requires pre-existing knowledge of neurology and psychology. While the first three parts of the book explain the mental workings of the people on the Spectrum in a visual and intuitive manner, the fourth section formalizes them to present a neurological hypothesis. Non-technical readers could skip this part, being reassured that they would not miss any novel concepts with respect to understanding and interacting with the people on the Spectrum.

A TILE OF THE PUZZLE

I do not pretend that the *High-Pass Filter Hypothesis* explains all the aspects of Autism Spectrum Disorder. However, I am fairly confident that it elucidates at least some of its symptoms and underlying processes. Most probably, the symptoms associated with the Autism Spectrum have different, concurrent causes, the High-Pass Filter Effect being one of them.[1] Therefore, I encourage the reader to read this book not as THE answer to the mysteries concerning autism but as ONE of the – a necessary tile of the puzzle.

[1] I believe that the second cause is a disorder of the Basal Ganglia, which causes people with ASD to prefer internal manipulations to external ones, for interacting with the world. I intend to address this theory in my next book.

MEDICAL DISCLAIMER

Even though I have spent much time researching autism, and even though many people already benefited from the content above2, I am not a licensed doctor, neither a licensed psychologist or a licensed neurologist.

This book should not replace the advice of medical professionals.

Also, please consider that people are very different from each other. What might apply to most people might not apply to you. Please always follow medical advice, especially when in contrast with what I write: your specialist knows better than I can (after all, I never met you, and cannot evaluate your specific condition).

You can read my full disclaimers at **www.autismclarified.com/medical-disclaimer** and **www.luca-dellanna.com/disclaimer**; by continuing reading, you accept their terms.

The World Through a Magnifying Glass

In this chapter, I will present a visual metaphor to provide Neurotypicals with a tool to intuitively understand how being on the Spectrum affects one's perception. ("Neurotypicals" is the noun referring to those who are not on the Autism Spectrum.) I encourage the technical reader to read this chapter, even if its language is non-technical, as the metaphor is indispensable for understanding the High-Pass Filter Effect – a concept which I will describe in the final chapter of this book.

THE MAGNIFYING GLASS

Imagine reading a book with a magnifying glass. If the magnifying power of the lens is low, one complete sentence can be read at a time (Figure 1). You can effortlessly focus on the meaning of the sentence as a whole. Moreover, you can easily predict the following words. In the example provided in Figure 1, the phrase *"You can go hunting with a knife and"* can easily be completed by guessing the phrase *"catch a bear"*[2]. This is how a person who is not on the Autism Spectrum (a Neurotypical) perceives the world.

Figure 1 – How a Neurotypical perceives the world

[2] Rhonda Booth and Francesca Happé first proposed this phrase in their 2010 paper dealing with the Sentence Completion test.
Booth, R. and Happé, F. (2010). "Hunting with a knife and... a fork": Examining central coherence in autism, attention deficit / hyperactivity disorder, and typical development with a linguistic task. *Journal of Experimental Child Psychology. 107*(4–5), 377–393. DOI:10.1016/j.jecp.2010.06.003

Now, imagine reading a book using a stronger magnifying glass; this time, you can only read a couple of words at once (Figure 2). You start reading from the beginning of the sentence, a few words at a time, until you reach the phrase "a knife and". At this point, your mind, focused on the few words it is seeing, will be tempted to predict the following ones as "a fork". The complete sentence, "You can go hunting with a knife and a fork", does not make much sense. However, if you consider that you could only see the phrase "a knife and", the "a fork" completion seems to be suitable. After all, "a knife and a fork" is a more common pattern than "a knife and catch a bear". This is how a high-functional autistic individual perceives the world. The fact that Autism Spectrum Disorder is associated with a deficit of the ability to broaden the spatial spread of visual attention is well documented[3] (in the example above, this corresponds to the lens showing fewer letters at a time).

Figure 2 – How a high-functional autistic individual perceives the world

[3] Mann, T. A. and Walker, P. (2003). Autism and a deficit in broadening the spread of visual attention. *Journal of Child Psychology and Psychiatry*, *44*, 274–284. DOI:10.1111/1469-7610.00120

Lastly, imagine reading with an extremely powerful magnifying glass, whose zooming effect is so strong that it only allows you to see a few letters at a time (Figure 3). You are unable to make use of the global meaning of the complete sentence anymore: you cannot use the context provided by the words preceding *"and"* (words which you cannot see any longer) to predict what will follow. Instead, the few characters you can see at a time appear much more prominently in front of your eyes, and other thoughts start to occupy your mind (for example, the font used to write them). These thoughts prevent you from memorizing the sentence word by word, to try and analyze its meaning as a whole. Consequently, you are stuck trying to determine the meaning of each word in isolation and the way in which they are written (for instance, why did they use this font? Why is that small ink stain there? What does that ink stain remind me of?). This is how a low-functional autistic person perceives the world.

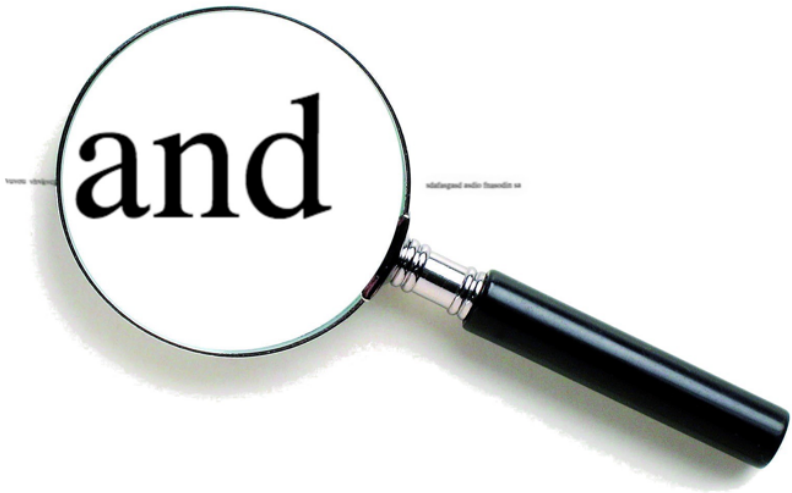

Figure 3 – How a low-functional autistic individual perceives the world

The Magnifying Glass effect explains the numerous effects previously collectively referred to as "Weak Central Coherence": how can you maintain central coherence if you are only able to focus on a single, restricted scope at a time?

THE HIGH-PASS FILTER HYPOTHESIS FOR ASD

The Magnifying Glass[4] is a metaphor for the High-Pass Filter that has been described by my *High-Pass Filter Hypothesis for ASD*, which I will present in greater detail the last chapter of this book (ASD = Autism Spectrum Disorder).

The High-Pass Filter Hypothesis also explains certain experimental results that are contradictory to the previous theories regarding ASD. An example has been presented below.

[4] The term *'lens'* as a figured explanation for ASD has been used since long (Burack, 1994, and other researchers). However, it has mostly been utilized for its meaning concerning the difficulty of zooming out to see the big picture, and it used to refer to visual stimuli only. However, here I use the term as a simpler proxy for the High-Pass Filter Effect, which causes detail enhancement as well as scope reduction. I also postulate that it applies to all perceptive channels (intra- and inter-channel, that is, both in reducing the scope and increasing detail inside a single channel and during the integration between channels).

FINDING THE GREEN X

An experiment[5] conducted in 1998 asked a few children to first to find an X in a set of monochromatic Ts and then identify a green X in a set of green Ts and red Xs. Children with ASD performed worse than control children in the first task, whereas they did better in the second. Apparently, this result stands in contradiction to the weak central coherence (WCC) theory, which predicts a slower performance on the part of the autistic children owing to an impairment in integrating sensorial channels (the shape and color).

The Magnifying Glass Hypothesis provides a coherent explanation in this regard. A representation of how a Neurotypical child would perceive the letters during the experiment is depicted below in

Figure 4[6]. In this case, the low power of the lens allows one to see plenty of letters at a time. But, since they are quite small, the details are hard to perceive (in this figural representation, the colors look alike, and the shapes are not well defined). Finding the green X is certainly a hard task.

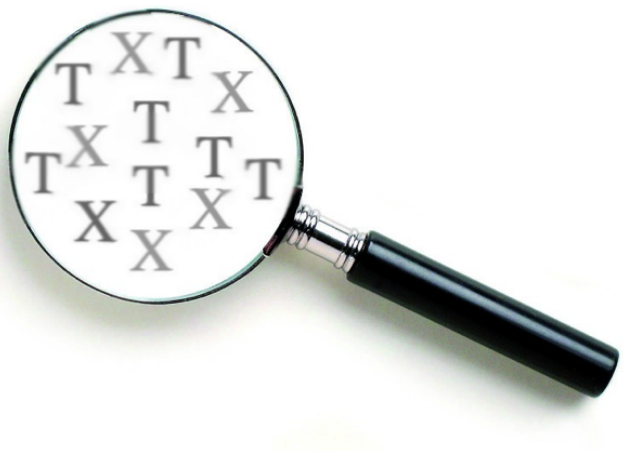

Figure 4 – How a Neurotypical perceives the "find the green X" task.

[5]Plaisted, K., O'Riordan, M., and Baron-Cohen, S. (1998). Enhanced visual search for a conjunctive target in autism: A research note. *Journal of Child Psychology and Psychiatry and Allied Disciplines*.

[6] Evidently, this is not a literal description of what happens in the minds of the children; it is rather a figural and exaggerated depiction aimed to help one understand how a cognitive style can help or hinder them with regard to the processing of features.

A representation of how a child with high-functional ASD would perceive the letters has been provided below in Figure 5. In this situation, the high power of the lens allows the child to see only a few characters at a time. However, since each one of them is bigger, the details are easier to perceive (in the brain, colors are linked to objects and their details). Thus, finding the green X is a simpler task compared to that of the one of the previous case (where the letters appeared blurry and colorless).

Figure 5 – How a high-functional autistic individual perceives the "find the green X" task

END OF THE EXCERPT

The full book can be purchased on gum.co/twtamg or on Amazon.

About the Author

An automotive engineer by training, after having led large teams and consulted for large multinationals, Luca quit his corporate job to become an independent researcher and author and dedicate his career to shedding light on the topic of emerging behavior. Luca believes that this topic is essential for preventing human suffering, especially as the scale of our civilization keeps increasing.

After having lived in Spain, Germany and Singapore, Luca recently moved back to his hometown of Turin (Italy). He spends his days between consulting, teaching, and conducting his independent research from his home, a coffee bar, or a park.

A few days a month, Luca also consults corporations and individuals that want to improve their businesses. Once per year, he teaches a Risk Management module at Genoa University, and a few times a year, he holds private intensive courses for entrepreneurs, operations managers, plant managers, and CEOs / COOs.

In the next pages, you can read a brief overview of Luca's other books.

Luca writes regularly on Twitter (**@DellAnnaLuca**). You can visit his professional website and blog at **www.luca-dellanna.com**. You can also contact him at **Luca@luca-dellanna.com**

You can show your support to Luca by recommending this book to your friends or colleagues, in case you appreciated its contents, by leaving a review on Amazon, Gumroad, or Goodreads.

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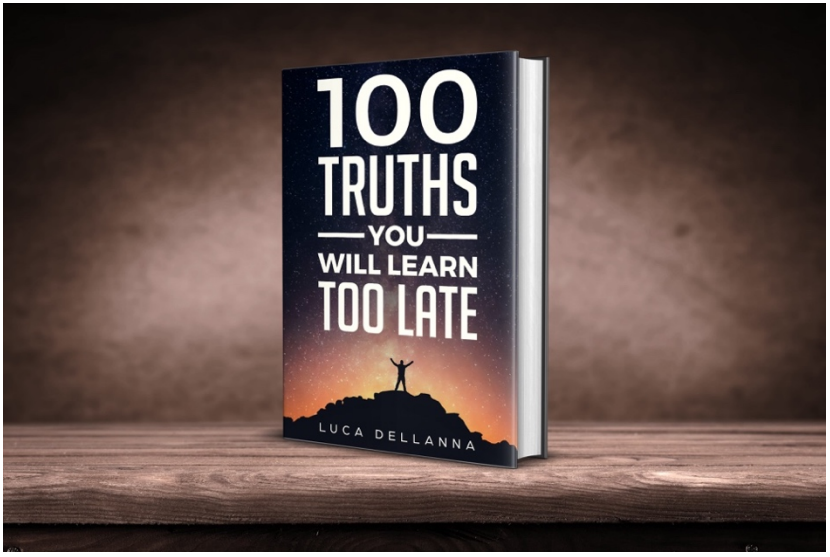
Luca's books can be ordered on **gumroad.com/dellannaluca** or on **amazon.com**

100 TRUTHS YOU WILL LEARN TOO LATE



"I am amazed at Luca Dellanna's ability to observe, compile, and articulate 99 very actionable life principles here. Each chapter describes the rule in a way that makes you think and then summarizes the Action. It's filled with DEEP insights yet VERY readable."

– Theresia Tanzil

"Absolutely brilliant. You might have grasped some of these concepts before but having them structured and in writing makes all the difference [...] I will surely recommend it to friends and co-workers."

– Alberto Pisanello

"A very thoughtful piece of writing, deep and wiring!"

– David Krejca

"Luca Dellanna's new book "100 Truths" is super tight! [...] Practical, directional advice."
– Hari Meyyappan

"100 Truths has been a game changer."
– Adam English

"A thoughtfully written book in very straightforward language."
– A.L. Peevey

I wasted years of my life because I did not know its rules.

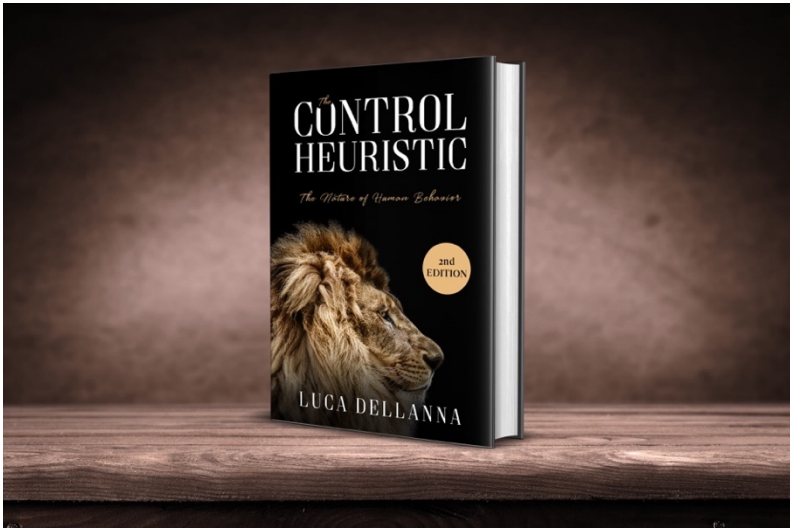
I did not know the rules of relationships, of careers, of health, of happiness.

Then, through hard work, talking with mentors, and trial and error, I uncovered some of them.

Now, I lay these rules out for you. In this book, you will find 100 of the lessons I learned.

It will still require hard work from your side to internalize them and put them into practice, but at least I hope to make this process easier for you by letting you avoid committing the same mistakes I did.

THE CONTROL HEURISTIC, 2ND EDITION



"A SUPERB book [...] by one of the profound thinkers in our field [behavioral economics]." – Michal G. Bartlett

"Just started Luca Dellanna's Control Heuristic [...] Interesting read, stylistically very approachable and absolutely actionable. Am only at page 30/300, but so far a serious recommendation for its conciseness." – Felix Kammerlander

"This book is like a magnificent suspension bridge, linking the science of the human brain to the practical craft of applying it in everyday life. I loved it." – Rory Sutherland, Ogilvy's Vice Chairman

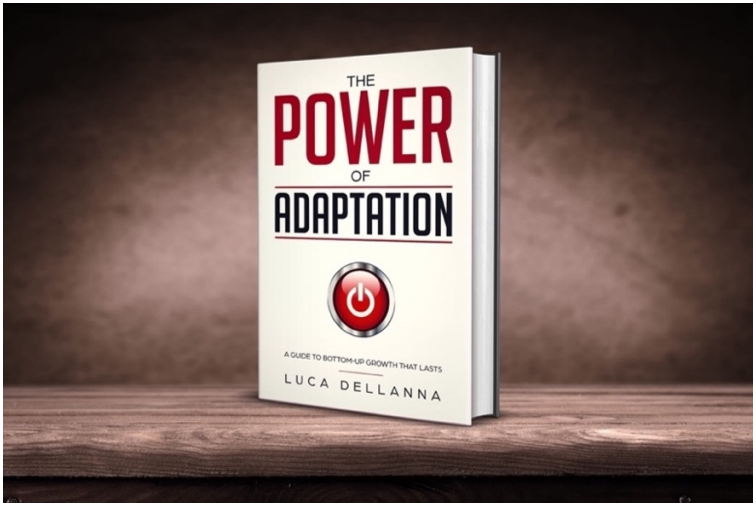
"Luca's book was so helpful to my work. Opened my eyes up to some more reasons why change is so hard."
– Chris Murman on the first edition

At a first look, human behavior appears as an inexplicable mess. Why do we behave irrationally? Why do I behave irrationally? Why is it so hard to change? What is happiness and why does it seem to escape us?

The brain can only be understood as a distributed entity. The key to understand it is in looking at how the different brain regions interact between each other, how misunderstandings become illusions, how selfish interests become irrational behaviors.

The Control Heuristic offers a new perspective to answer these questions and provides a guiding light to shed the darkness of the subconscious resistances that prevent us to behave like the man or woman we want to be.

THE POWER OF ADAPTATION



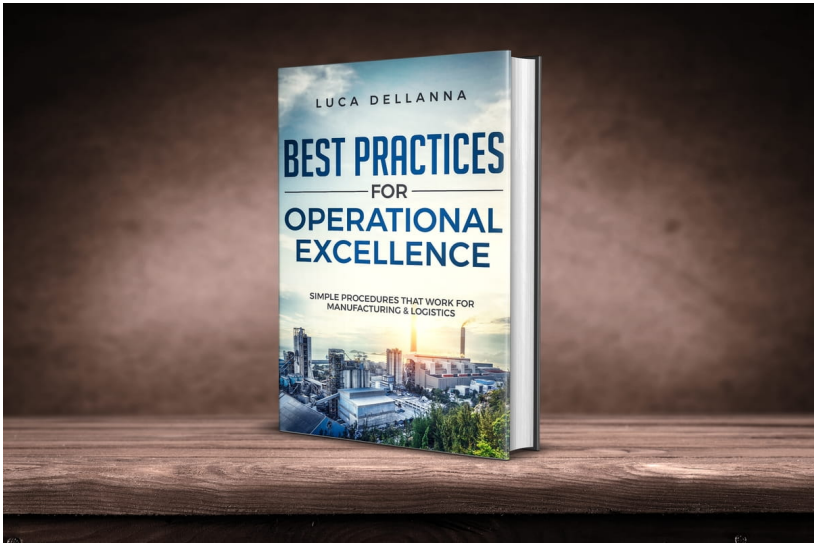
"This guy! Luca is amazing. So insightful with common sense applications of complexity and the ability to communicate clearly!!" – Bob Klapetzky

This book is for you if:

- You like books dense of information.
- You appreciated books such as Taleb's *Antifragile*.
- You understand or are willing to accept that the world is dynamic, and that understanding how something changes is more important than understanding how something works now.
- You do not like usual business / self-help books that provide solutions that only work in the short-term.

"The Power of Adaptation" focuses on the topic of adaptation as the main force shaping the world as we know it. However, adaptation is an emergent process and thus cannot be understood with narratives, nor can it be acted upon directly. This book aims to describe the basic phenomena which weave together into what we perceive as adaptation and to provide a guide to help the readers practicing the four behaviors that will help them harness, rather than fight, change.

BEST PRACTICES FOR OPERATIONAL EXCELLENCE



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- The Eight Best Practices of Operational Excellence.
- How to roll-out and sustain a change initiative.

Acknowledgments

To my future wife, Wenlin Tan, for having provided me with love and support.

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To my father, for the same and for stirring intellectual curiosity within me.

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To my friends and everyone else who, directly or indirectly, knowingly or unknowingly, contributed to my well-being.

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To my Patrons Ross Screaton and Malcolm Ocean, whose help gave me stability on top of which to conduct my research.

Table of Figures

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