'Professor Hanson and Professor Green have presented a candid, challenging and thought-provoking response to the question: what makes a person? Their book takes you on a journey through the first 1000 days of life highlighting how physical, environmental and economic factors influence our long-term health. Whether you are a parent already, planning to start a family or simply curious about health, this book will appeal to a wide audience and will most certainly nudge you towards some level of behavioural change.'

Nathan Atkinson, Co-Founder, Rethink Food

'Professor Hanson and Professor Green provide an important view regarding the importance of early fetal development and that as we control our health and exposures we can exert an important influence over the health of our children. They provide the ease of discussion for the lay public, explaining sexual reproduction and the complexities of delivery. They then effectively develop the important concept that long-term health risks like non-communicable diseases are embedded and the effects impact the next generation. They remind us that the exposures women are subjected to may not be under their control and introduce the concept of “prospective” responsibility – in other words the concept that we all need to work together to ensure that as a society we give the next generation the best start to life.'

Jeanne A. Conry, President, The International Federation of Gynecology and Obstetrics
WHAT MAKES A PERSON?

Ever wondered why your life and health can sometimes be so hard to control? Or why it seems so easy for other people? Mark Hanson and Lucy Green draw on their years of experience as scientists and educators to cut through the usual information on genetics and lifestyle to reveal the secrets of early development which start to make each of us unique, during our first 1,000 days from the moment of conception.

Some surprising discoveries, based on little-known new research, show how events during our first 1,000 days make each of us who we are and explain how we control our bodies, processes that go way beyond just the genes which we inherited. Provoking new ways of thinking about being parents, this book empowers individuals and society to give the next generation the gift of a good start to life and future health.

Mark Hanson directs the Institute of Developmental Sciences and is Emeritus British Heart Foundation Professor at the University of Southampton, UK. He is a founder of the International Society for the Developmental Origins of Health and Disease. He is an Honorary Fellow of the Royal College of Obstetricians and Gynaecologists and of the Royal College of Paediatrics and Child Health. He has chaired committees and working groups for the International Federation of Gynecology and Obstetrics, the Partnership for Maternal, Newborn and Child Health and WHO. He researches early developmental environment effects on health across the life course, mechanisms and interventions, in high and low- to middle-income countries. Mark pioneered ‘LifeLab’ to promote health literacy
in school students. He has authored over 400 papers and 11 academic and popular books and advocates application of developmental science to health policy.

Lucy Green researches and teaches early development effects on lifelong health at the University of Southampton. She advocates for the physiological sciences with the International Society for the Developmental Origins of Health and Disease, as a Trustee of the Physiological Society, and as a Fellow of the Royal Society of Biology (where she holds the 2019 Senior Investigator Outreach and Engagement Award), and as Head of Engagement in the Faculty of Medicine. She champions public understanding of science including as a 2018 British Science Association Media Fellow at the BBC, innovating engagement activities for science festivals and devising health-science experiences for young people which enable them to question expert panels and steer the discussion of big health issues. She lives with her family (of 5,000, 6,000 and 20,000 days) in Hampshire.
What Makes a Person?

Secrets of Our First 1,000 Days

MARK HANSON
LUCY GREEN
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PREFACE

Here’s a question: do you feel in control of your life?

If you’re younger than 16 you’ll probably answer ‘No’ to this question. There are so many things which are uncertain – your next steps towards a career, relationships, where to be ... and your actions and decisions tend to be governed by ‘grown-ups’ and society in general.

If you are in your twenties the answer to the question will probably be ‘Yes, I’m in control but ...’. You’re an adult, but there’s lots more to learn and to experience in your life ahead. How much of it will be outside your control is uncertain.

The older you are, the more likely the answer will be ‘Yes’ – you may be better informed and freer to make decisions about many aspects of life, while also having discovered from experience how many barriers there are and how difficult being ‘in control’ can be.

Of course, with advancing age, for everyone there comes a time when we feel ‘Well, I used to be more in control than I am now’. It seems to be the young and the old who don’t feel completely in control of their lives.

Our quality of life is frequently linked to the amount of control we have, or feel that we have, and this in turn is frequently linked to our health – both in terms of how healthy we actually are and how healthy we feel that we are.

There is no doubt that some aspects of our health are within our control. To an extent we can control what we eat, when we get up and when we take exercise. But some things which clearly affect our health are outside our control. Most of us feel that this is particularly true of the genes we have inherited from our parents, over which we had no choice and which we can’t control.
Even so, with new technologies and new knowledge about how our genes control our lives come new and grand aspirations that we might be able to engineer the best chance of staying healthy into older age. This might be genetic engineering in the very early embryonic stages of life or personalising medicine to best suit our individual genetic makeup.

This book is about control, but not that kind of control. This is different.

We have written this book to reveal some secrets about a different kind of control that we might have, as parents or as a society, over the first 1,000 days of the lives of the next generation, from conception to the age of two years. It’s time that these ‘secrets’ that are based on major research endeavours around the world over the last 30 years became common knowledge.

This book is about how much we are in control of a particular aspect of our lives – our health. We hope that in reading this book you’ll discover that your own ability to be in control, to be healthy for as long as you can, depends on things you may never before have considered.

Before we go on, we should probably ask what being in control means. Whether you are driving a car, planning a party or just walking a dog, there are three parts to it. You need inputs which show how you are doing; you need actions which can change the situation; and you need a control centre to link those actions to the inputs in order to achieve the desired goal – the car stays on the road, the dog stays on the path and the guests, food, drinks and entertainment all come together at the right time and place for the party.

There are aspects of the control of yourself, your body and your health, which you do unconsciously. You don’t think about controlling your blood pressure or heart rate, or what goes on in your intestines after you’ve eaten a meal. You can’t control your dreams when you are asleep. But, even
without conscious control, these things change with experience, as if we were practising them, influencing them.

Mostly, we think of control over our health in terms of how much we exercise, what we eat, how stressed or tired we are and other aspects of our behaviour or lifestyle. This is of course quite right, and we could add that we learn the importance of these things through experience as well as just being told about them. And we may improve our ability to control our health by practice. In the same way we don’t let anyone drive a car alone until they have acquired the necessary skills, both in theory and through practice.

So, going to the gym helps your heart to perform better. Consuming a diet containing enough fibre will improve your digestion and prevent constipation. And watching horror movies late at night is likely to colour your dreams. We have some ability to influence these aspects of our lives. But some people seem naturally to have healthier hearts and guts, and happier dreams than others.

Most of us accept that, however much we teach and practice some things, some people never pass their driving test and some of us really struggle to keep healthy. Then there are some people who seem just ‘naturals’ at driving a car, a particular sport or living to an old age with good health. Maybe it’s in their genes? Or maybe not.

Past experience and practice unconsciously changed the ways we control our bodies and our health. This book focusses very specifically on a period of our lives when all this was certainly outside our control.

This book is about the ways in which past experience and practice unconsciously changed the ways in which we control our bodies and our health. But it focusses very
specifically on a period of our lives when all this was most certainly outside our control.

We don’t mean the genes you inherited from your parents, over which of course you had no control. We mean the experience and practice that took place at a time when you had no notion of being ‘you’. It’s the first 1,000 days of your life, from the moment you were conceived until your second birthday.

The clock of your development started to tick then, but you had absolutely no idea about it.

You might feel that exploring your early development is likely to be rather fatalistic and depressing. After all, you can’t do anything about what happened during those 1,000 days of your life, all those years ago. If you can’t turn the clock back, why bother about it? Wouldn’t it be better just to live in the moment, control what you can right now?

No. This book will explain why.

It will show how our first 1,000 days of life was critical for each of us in setting up the control systems in our bodies. Just because you did not consciously choose these control settings for yourself does not mean that they are not highly personal to you and very important.

The first 1,000 days of life is a time about which scientists, doctors, philosophers, as well of course as prospective parents, have thought a great deal. It’s probably the time in our lives about which there is more myth, anecdote and superstition than any other. We need to separate the fact from the fiction if we are to understand why this period of our lives matters so much.

We’ll see that some seemingly old-fashioned ideas which have been believed for centuries, are proved by recent research to be right. We’ll also find that some newer scientific ideas are almost certainly wrong.
Preface

The first 1,000 days is a time in life which is the scene of cutting-edge scientific research and heated debate. A lot of this is not widely known. We’ll see that some seemingly old-fashioned ideas about this period of life, which have been believed for centuries, are proved by recent research to be right. We’ll also find that some relatively newer scientific ideas are almost certainly wrong.

We’ll see that your first 1,000 days of life affects many aspects of your future life. What happened then may even influence how long you will live, how well you live and what is likely to kill you. It isn’t just our genes that we pass on to our children. From the moment of conception and for the next 1,000 days we pass on information and signals which will influence how the child’s control systems develop.

Of course our developmental processes, by which we become the individuals we all are, don’t stop when we are two years old. But research increasingly shows how the stage is set in those first 1,000 days, and how the hidden drama over which we each had no conscious control has been played out. We wrote this book knowing that this is important to how we live and what we do.

To tell the story of our first 1,000 days we could look back and attribute some of our misfortunes to irretrievable problems in our early life, blame our poor genes or our early upbringing. This book does not use this approach.

Instead, we’ll suggest that we can use the benefit of hindsight, of knowing the secrets of those 1,000 days, to look forward. Understanding those early days of life could help us understand the ways in which we control our lives more thoroughly and perhaps to make them better in the future. And this may in turn help those who follow us, the next generation, to benefit.

We’ll start by looking at what makes the two-year-old the person they are, with their unique personality and
very definite place in the world. They are now in control of their lives in some ways, although definitely not in others. We won’t be providing a manual on how to bring up a baby or infant – there are many of those already. For the parents of a toddler reading this, we hope to provide insights and new ways of thinking about child development, but not advice.

In Chapter 2 we’ll go back to the beginning of our childhood, to birth itself, to ask questions about what happens during this risky time in our lives. Birth is dangerous – some experts would say that, after the danger of our final moments on this planet, being born comes second in terms of life-threatening risk. Who’s in control then?

Chapter 3 will take us back into the womb, to explore the amazing life of the unborn baby, or fetus. This isn’t a textbook for medical students, nurses or midwives – there are many such books already. But exciting new scientific discoveries mean that the mysteries of pregnancy have got fewer. At a time when no-one is watching, fetal organs and control systems are developing, and so are aspects of behaviour too. The pattern of this development of the fetus is of huge importance for lifelong health.

Going back from fetal life we arrive in Chapter 4 at conception – sex. You might think that there wouldn’t be anything very interesting to consider in the development of a simple little embryo before it becomes a fetus at about 50–60 days into its first 1,000 days. You would be wrong. New discoveries have shown just how important this time in our lives was, and is.

The inequalities and inequities which already existed have been dramatically widened and worsened by the COVID-19 pandemic everywhere.
Preface

Chapter 5 gives us the opportunity to think more globally, about how the events leading up to the first 1,000 days affect our health as adults, and the implications for equity and social justice across genders, social groups and ethnicities. These have enormous importance for society, and not just for girls and women or for mothers, and the tendency to put the blame on them is something which we strongly denounce. The inequalities and inequities which already existed have been dramatically widened and worsened by the COVID-19 pandemic everywhere.

The last chapter in this book will ask what we all can do to make the lives of the next generation as good as possible. Now that we know some of the secrets of our lives in the first 1,000 days, how can we pass on the best gift ever, of a good start at that time, to the next generation?

We felt that this story is best told by starting at the end and working back, like the detective arriving on the crime scene who traces back the clues they uncover to discover what happened. Our first 1,000 days led up to the age of two. So that will be the start of the story.