

A Portrait of a Scientist as a Young Mind

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An Architecture of the Mind: A Psychological Foundation for the Science of Everyday Life. Brendan Markey–Towler. Oxon: Routledge, 2018, 124 pages, \$94.99 hardcover.

Our lifetimes as scientists take us through many career stages. There is at first, for most eventual scientists, the stage of not knowing one will eventually be a scientist, but approaching the world with an instinctive curiosity and playful mental flexibility that eventually inform one's work as a mature professional. Then there is the stage of having chosen science as a career but feeling cowed by the perceived greatness of prior thinkers and unsure as to whether one really has “what it takes” to wear the mantle. Then, after some initial success, comes the phase of feeling that one must gain acceptance in one's chosen field from incumbent scientists, which typically in the modern life of a scientist involves publishing in highly-ranked international journals. This task is made easier if one cites (ideally in glowing or at least not negative terms) living scientists who will be editing or reviewing one's work, and can also be made easier when one has a true scientific advance to offer, although that is not always true; in subfields where career success has (temporarily) trumped scientific progress as the motivating ideal, significant advance may be less likely to be published than incremental advance. Young scientists who find it easier to maintain mental illusions — for example, about the importance of whatever is presently being published in their field, and/or about their own as-yet-undiscovered greatness — find this stage easier to navigate than others. Finally, for those souls who weather the prior stages and still remain in the profession, there is the stage of enjoying, with the occasional wry smile, essentially free rein to research and say what one likes as long as one can stomach having a

few enemies. This stage can enable people to contribute the highest-value work of their careers when they couple their in-built intellectual impulses with the sage lessons learned through years of experience, and to protect creative youngsters, for example through mentoring or working in collaboration with them to get promising new ideas published. Arrival at this stage has also been known to lead ageing scientists, perhaps in a mark of personal desperation or remorse for what they come to recognize at some level as careerist behaviour in their earlier career stages, to use their remaining (professional, if not physical) power to exclude younger scientists from competing in the search for new enlightenment, perpetuating the politics of science by hampering the emergence of true advance.

Brendan Markey–Towler’s *An Architecture of the Mind: A Psychological Foundation for the Science of Everyday Life* — a short book, at only 98 pages of main chapters, including in-text mathematical formulas — is offered by a young scientist who, unusually for his career stage, appears to see what his profession expects of him at this moment but has consciously decided to fly against those expectations. Not only is this type of output highly unusual for his age, but Markey–Towler is correct in his statement in the Preface that a book like this is not a typical research output for a scientist of our age in general. While his peers and his senior colleagues too have been beavering away on their next submissions to the *American Economic Review* or *Psychological Science*, Markey–Towler has called upon¹ the indulgence of his mentors, his employer, his wife, and himself to spend some of the most potentially productive years of his career creating a monograph that attempts to link together many different ideas and observations about how our brains make sense of the world and provide us with direction for our behaviours. Having made this unusual choice naturally creates the incentive for Markey–Towler to almost fanatically believe in his endeavour. To justify his radical departure from the typical effort allocation pattern for young scientists, he must believe that his book project offers something worth the career and personal sacrifices that it represents. Does it?

My protective impulses towards anyone who tries to buck careerist trends to deliver real advance make it emotionally difficult for me to reject Markey–Towler’s endeavour in its entirety, and I aim in what appears below to make clear which aspects of the work deserve further development and attention by the broader scientific community. Markey–Towler is right that science sorely needs more scientists to find ways of breaking out of their siloed laboratories to see the grander picture of humanity, both because of the usefulness of that grander picture and because of the dangers of taking any individual silo too seriously.

Yet as a whole, this book does not lay the new groundwork for broad scientific advance that Markey–Towler promises. It becomes clear after a chapter or two that

¹ This calling-upon is both implicit and, via recognition in the Acknowledgements, explicit.

Markey–Towler’s audience is not other scientists, but himself. With this book he puts down on paper in one place, and in his own words, his particular version of various truths about human minds and behaviour that he has been discovering as a young scientist through his reading of prior work and his personal reflection, introspection, and testing. Writing for himself rather than for others, he produces a work that is subjective in its coverage, with topics included or omitted based on their relevance for Markey–Towler personally and intellectually, rather than based on their power to advance the present understandings held by scientists-as-a-group. Much as it pains me to admit it, this work is just as self-serving as the products of many other career-oriented young scientists whose efforts result in published articles in high-ranking journals — and those articles are more likely than this book to be read by others, meaning that any genuine intellectual nuggets they contain have a higher chance of being spotted by someone in a position to build upon them.

For this reason, I see the primary purpose of this critical review to be the articulation, for the benefit of an audience broader than the book will reach, of those kernels of scientific value that it does contain, albeit often in obscured form. A secondary necessary but mournful purpose, and that which guides the latter and larger part of this review, is to support my view of the book as a whole as failing to be useful.

The Vision

In his own words, Markey–Towler tells us that he wrote this book “because [he] needed a theory of how we orient ourselves to, and act, within the world” (p. xi). The startling breadth of this statement, coupled with the short length of the book, immediately signals either that we are holding in our hands the distillation of true genius, or that the book’s purpose will have to be whittled down to something far less grand in order to fit it within the covers. Let us for the moment suspend our disbelief and sketch what vision the book promises, and what ingredients are proposed to get us to that vision.

The promise is of a unified theory, explicated in both verbal and formal mathematical terms, of how the human mind makes sense of the world and how it then conveys behavioural instruction to the human organism. The starting point the author selects is, unusually for an economist, philosophy. Chapters 1 and 2 consider the nature of mind and thought from a philosophical and particularly metaphysical perspective, and also use analogue reasoning to frame the later and more practical discussion of how the mind operates. The model of the mind as a network structure then is carried into Chapter 3, which contains the heart of the book: formal mathematical definitions of and in relation to perception, analysis, behaviour, and choice, coupled with the verbal explanations that Markey–Towler initially led us to expect when he stated in the Preface that he had “written the work in such a way that were one to simply eliminate the mathematical symbols, one would still find the book

coherent and integral....No equation or symbol is set down which does not have its content explained immediately before or after it in plain English” (p. xiii).

After Chapter 3 we move into contextualizations, applications, and justifications, beginning in Chapter 4 with a discourse on how the mind-as-network framework of understanding thought and choice is not inconsistent with the roles of such standard-bearers of modern social science as habit, social norms, heuristics, and rationality. Chapter 5 delves into the specific question of whether foreseen outcomes are substitutable with one another or not, portrayed as crucially important in driving choice behaviour. Chapter 6 then considers and links back to the mind-as-network framework certain aspects of perception, emotion, and decision-making over time, and also asserts the consistency of this framework with particular tics of the human mind such as a dislike of cognitive dissonance, a tendency to compare incoming signals to what has already been perceived, and a susceptibility to stories. Chapter 7 concludes, notably with a reminder about the subtitle of the work: what is presented in the book is intended as a foundation for what Markey–Towler refers to as the “science of everyday life,” defined in his words as “a new, useful science of ourselves, our place in the world and our interaction with it” (p. 94). He foreshadows on page 96 that specific foci of this “new science” might include psychopathologies and the realm of social networks, promising *inter alia* that were we to apply what is contained in the present book to the setting of individuals operating within social networks, “we would discover a new theory of society and social interaction built from an integrated, holistic and systematic theory of how individuals respond to their world and act in it on the basis of their psychology.” This is a young author who publicly foresees for himself and his work a role in the social scientific endeavour far grander than the vast majority of his peers would dare to do for themselves. Many scholars early in their careers think they will change the world with their science; few admit as much so openly, and fewer still lay down gauntlets in front of themselves so brazenly.

With the above vision staring at me in the table of contents, I was excited to read this book. Theoretical economics has arguably become trapped by its own haughty formalism and seductive tractability into an ever-weaker position from which to try to understand and predict behaviour. The core theory of the discipline does require a make-over in order to support an image of relevance in the face of modern challenges like behavioural economics, fMRI machines, and post-GFC cynicism. Amending its primitives relating to psychology and motivation seems likely to be a fruitful place to start.

Nuggets of Value

Several points the book makes are under-recognized or under-explored in social science. I highlight them here in the hope of drawing more attention to them from other scientists.

We are told on page 7 that the mind can exist quite apart from reality, being fed only by perception. This insight (repeated on page 15 and elsewhere) is not new, but deepening its penetration into social science has the potential to improve our models of decision-making. If it is not reality but perception that should be expected to drive behaviour, then to understand decisions one must also understand the filters through which people interpret their realities. One implication is that subjective reports may be more useful than many economists today might think. Self-reported data on income, for example, may better predict discretionary expenditure patterns than objective income data drawn from tax offices; subjective health reports may better predict some health-related choices than objective measures taken from our blood. Going further, Markey–Towler reminds us starting on page 78 that all perception is made possible as a result of contrast, with the corollary that salience is primary in igniting thought and driving behaviour. This observation may be useful, as the author implicitly recognizes on page 84, in writing apologies for models of subjective beliefs that take reference points as inputs.

The author proposes on page 34 that a person's mind is less likely to accept something the more it contradicts what already resides at the "core" of his current mental model of the world. This is a slight enhancement of the normal cognitive dissonance theory (for which a mathematical expression appears later on the same page) and its creation is a direct result of taking seriously the network structure that Markey–Towler proposes for the mind. The basic notion that it is not strength of contrary belief per se, but rather position of contrary information within their mental model of the world, that is most relevant for predicting the degree of people's resistance to a new idea may prove useful in, for example, better understanding behaviour in the persuasive industries.

Although preference theory² does infect the present work, Markey–Towler comments on page 29 on the lack of need for completeness of preferences if one wishes to explain choice. This is valuable inasmuch as it speaks to any die-hard preference-theory aficionados in language they will understand, sending the message that one of the conventional axiomatic requirements of preferences (i.e., completeness) is not actually needed for practical purposes. While many have driven stakes through the heart of preference theory (e.g., Anand, 1987; Hédoin, 2016), a stake wielded by a modern insider may prove more fatal.

The Whole is Less than the Sum of the Parts

There is little in this book with which a reflective social scientist is likely to violently disagree. Taken as a whole, it presents a reasonably plausible just-so story

²By "preference theory" here, I refer to any theory that asserts people to have fixed preferences across goods, as does the classic presentation in Von Neumann and Morgenstern (1944) and its subsequent incarnations in, for example, Samuelson's revealed preference theory.

where one keeps hoping to turn a corner and find a truly novel and useful big idea.³ Because that big idea is not forthcoming, the book as a whole is more disappointing than its various, mostly plausible, components. The book-as-a-whole leaves the reader feeling disappointed because it has been crafted not to build towards a novel big idea, but to fit the idiosyncratic interests and prior points of puzzlement of its author. This design goal comes across clearly in the narrow approach to topics, in topic selection, and in the unique collection of oblique references the book contains.

As a starting example, on page 30 we are told that human indecisiveness may arise from situations where “[l]ike Buridan’s ass we may be paralysed by our indifference...” The first clue that this reference to Buridan’s ass is made for the benefit of Markey–Towler rather than for us is that drawing the parallel adds nothing. The ass couldn’t decide between haystacks, as we cannot decide between (say) chocolate or vanilla, because we are (both) so very indifferent. So what? All that we then learn, or rather are reminded, is that some aspects of humans’ brains may be similar to animals’. Without more detail, this is a vague and unhelpful thing to point out.

The direction being hinted at in the example above is in fact radically underexplored in the book, which serves as another clue that the point of its inclusion is not to illuminate something important for the reader. On page 5, as Markey–Towler weighs and contemplates various philosophical views of consciousness and the mind offered throughout history, as if trying on different hats he might wear to a party, he comes to be particularly taken with the view that the mind is “emergent” from the brain. Suspending our potential disbelief of the usefulness of this statement from a modern social scientific perspective, and entering Markey–Towler’s philosophical meadow, we might naturally ponder the plausibility of this conjecture. For what evolutionary purpose, we might ask ourselves, would a “mind” (by which is meant by Markey–Towler essentially consciousness and all it comes with, such as conscious control of thought and behaviour) be selected to “emerge” from a brain? To what extent do other animals have “minds”? When in our evolutionary history did “minds” emerge — or to use Darwin’s words, “how does consciousness commence” (as quoted on page 10357 of Mashour and Alkire, 2013)? Modern social scientists who have contemplated the very essential components of human cognition often ground their emerging theories by making at least passing reference, if not devoting entire oeuvres, to the investigation of structural or functional commonalities between humans and other animals (e.g., the geese of attachment theory, mentioned in Bretherton [1992], or more recently the great apes of future-oriented cognition [Osvath and Martin–Ordas, 2014]). This is

³To be fair, some readers objected to my 2013 book with Paul Frijters (Frijters and Foster 2013) precisely because they felt the new synthesis of ideas that we presented resembled more a just-so story than a scientifically defensible exercise. I leave it to the reader to judge the merit of that critique.

wholly absent, with the exception of the reference to Buridan's ass, from the present work. More disappointingly, there is no attempt to defend the mind-as-network model on the grounds of biological efficiency (is a network structure working as the author asserts that it does within the brain the least-cost way to organize an advanced organism's decision-making apparatus?) or evolutionary fitness.

An area even more underserved by the author relates to where our desires originate. Only on page 49 do we arrive at any sort of reckoning with the origins of desire or motivation. Markey–Towler's decision maker to that point has wandered the world aimlessly, with no needs or emotions to guide it, continually encountering stimuli that assault the network structure within its skull equipped to process inputs from reality and from itself (via imagining and creating, for some as-yet-unknown purpose) into a mental model, and decide upon or against actions based on the relative preferability of their expected outcomes according to that model through consultation with a static map of preferences across thoughts (defined on page 26). Though it presumably has had the ability to consciously direct its thoughts, since it does have consciousness, we have been told nothing about the basis of the direction given by the decision-maker's consciousness. The latter part of Chapter 4 then tells us that the origins of its preference map — and hence of all feelings, drives, motivations, and desires — lie within the “deep psyche” (double quotations around “deep” in the original), with hat-tips to prior thinkers like Freud, Maslow, and Jung decorating the fewer than four pages in the book devoted to contemplating why people do things. Why people do things is arguably the fundamental question targeted by all of social science, and one to which an accounting of the “architecture of the mind” implicitly promises an answer, thereby tempting at least some social scientists to bend and pick up the book in the first place. What emerges from these four pages at the end of Chapter 4 however is no new and useful insight, but rather a re-statement of what most people on the street, and certainly most social scientists, already know: desires come from somewhere within us, they may be to some extent but not completely manipulable through experience, and they guide our decisions. What have we learned that is new? We have not even, in a book allegedly to do with the “architecture of the mind,” come to terms with the relation between the conscious and the subconscious minds in generating thought and driving behaviour, much less begun to understand why the different levels of consciousness process inputs in the ways they do. The author accepts that non-conscious processes exist and are powerful (“... a significant portion of our behaviour will be determined by mental processes beyond the realm of conscious awareness, and we may not even be aware of the processes by which our actions are determined” [p. 45]); he just doesn't interrogate the motivations for them. Factors that drive desire, including mood, hormones, social identities, age, sex, and so on surely inform the (largely subconscious) rules used by the “phenomenological I” (p. 8) in deciding whether to accept or reject a particular new connection, deeming it to be or not to be

“useful.” Yet these influences are all dealt with in the latter half of Chapter 4 (“Reasons, Rules, Society, and Motivation”), in isolation from the treatment in Chapter 3 of the way the mind works. Separating motivation from structure and process in a book purporting to explain how our mind operates is at best self-limiting, and at worst a bullet to the brain for the endeavour as a whole.

One might for example start with the notion that once our basic needs for food, shelter, and so on are met, we are primarily motivated to preserve a positive view of ourselves, a view underpinning Brennan and Pettit’s “economy of esteem” (Brennan and Pettit, 2005). One might instead try on for size the premise that people’s primary motivation beyond the meeting of core needs is social: that each individual wishes deeply to feel at one with and accepted by others. This would be consistent with observations like the power of ostracism and the high health consequences of loneliness. One might instead proclaim that people wish to gain mastery over their world, which would then rationalise our achievement of great feats of art, science, literature, and so on. The core motivations that people possess — presumably for reasons ultimately sourced in evolutionary selection — are no less part of the architecture of their minds than the way their neurons are organized: motivation, thought, and behaviour are mutually inseparable. If for example people are motivated to see themselves in a positive light, then that makes it more likely that their minds will be structured to support, to be drawn to, and even to invent interpretations of the world that deliver that message. Even a model of the mind as the *ex-post* rationaliser for the actions we already wanted to do for some unarguable reason (e.g., attract a mate, acquire food) is a model that at the end of the day would be more useful to social science than a model of the mind as a network that acts upon incoming input with no systematic bias, or with a bias whose possible existence is admitted but remains uninterrogated. Emotion is not a *deus ex machina*, erupting (or not) within the gut when the mind stumbles onto an idea; emotion is a primitive, deep within the machine itself, both driving and being driven by all its evolved cognitive structures, processes, and behaviour.

As a leading example of the author’s narrowness of approach, the vision of the mind as a network structure which underpins the entire book under-emphasizes the dynamism of our brains. If people learn, then the contents and structure of their minds change over time. New information is constantly being added, existing information changes or disappears, and connections are created and destroyed constantly as we move through our lives. Dynamic networks are far more complex to understand and to model than static ones, which is perhaps why Markey–Towler does not attempt to push his analysis much beyond the possibility of a static mind. Yet the fiction of the mind as a static network, painfully redolent of the fiction of static preferences that casts its ghastly shadow over the author’s work on page 26, underpins much of the mathematical exposition in the book. The reality that minds change is nodded to at the close of Chapter 2, where with

furrowed brow the author clumps into the phenomenon of “indeterminacy” the whole of the in-selection and out-selection of mental connections, a phenomenon perceived as problematic by the author more because it undeniably happens when we create than because it equally undeniably happens when we learn. This nod is repeated in slightly more fleshed-out form in the final few pages of Chapter 3, where the author proposes rules of thumb using which to understand which sorts of possible new connections are in fact formed (essentially two in number: [1] we are more likely to incorporate some new connection if it confirms what we already perceive and if it is obvious, and [2] connections decay naturally). This treatment stops there however, such that its use is mainly as a broom to sweep the whole issue of dynamism under the carpet, leaving the author absolved to continue on the march of playing within a fictive static sandbox for the remainder of the book.

His play takes the form of prose meanderings and of mathematical fancy. The mathematical bits in particular, flagged at the start as being inessential to the story (and hence, one might wonder, pointless?) prove themselves indeed to be gratuitous time and again. On pages 13–14 for example, what do we gain by pondering the difference between V and V_N , representing different subsets of information in the world? On page 27, Theorem 2 with much pomp and convulsion ends up telling us simply that people choose things they most prefer out of all options that are feasible. How is this helpful? Gratuitous mathematics appear everywhere in the text, with Greek letters and formal propositions (not to mention the book’s entire 20-page Appendix of formal proofs) akin to confetti used to decorate the ideas rather than as tools used to cement and further explore them. If an idea is to be presented formally through the use of mathematics, it is thought courteous at least to demonstrate the usefulness of that formality to one’s reader. Otherwise we are left with no more than a formalized version of what we already knew before reading the equation (and indeed often before reading the book), meaning the mathematics lead us nowhere.

There is then the matter of the author’s implicit (and almost surely subconscious) assumption that the reader has read the same works that he has, and hence will understand and appreciate the many oblique references that, like the above-mentioned ass, add little than the impression that the author is satisfied at having drawn a connection between them and his material, no matter how long the bow or how purposeless the arrow. For example, we have the “Black Swan event” (p. 20); the principle of sufficient reason (p. 7); Kant’s “a priori synthetic statements” (p. 8); the “Red Queen” effect and Herbert Simon’s “calm dispatch” (p. 80); and so on. Some of these references will be familiar to some readers, but few (apart from Markey–Towler himself) will nod knowingly at all of them, yielding an insider/outsider division between the author and most of his readers.

Further dampening prospective readers’ enthusiasm is that a few claims in the book fly in the face of established convention for no ultimate purpose. I daresay a few psychologists would quibble, for example, with the assertion that personality

is obviously identical to “the way we think about the world” (p. 19). The emphasis on the core economic concept of substitutability — shown in the devotion of an entire chapter to the concept — leaves us with no more than the assertion that everyone has a price at which she will trade, except when she really doesn’t want the good. Even that latter exception ignores the existence of secondary markets: the author’s own example of not being tempted by sales on women’s clothing, no matter how deep the discount, assumes that there is no one he could buy for and be reimbursed. If we are to believe there are no secondary markets, then in addition to finding a different example of non-substitutability the author needs to tell us more about the origins and plausibility of it: is it baseline stubborn preference heterogeneity across people, baseline stubborn preference for variety in all people, or something else entirely, that accounts for why people say for certain options that “it just doesn’t cut it” at any price? Is fixity of preferences really the right place to be looking to understand why sometimes people dig their heels in and refuse to opt for a particular alternative at any price? As another example, the concept of ethics is introduced stealthily on pages 50–52, adding an almost mystical interpretational overlay on the author’s version of preference theory through the introduction of words like “values,” and arriving at a concluding paragraph that proclaims that everyone must have a “moral core” using which they make judgments, or else they inevitably encounter decision paralysis. While it is incontrovertibly true that people are often guided by what they value when they act or fail to act, and hence that valuing nothing (similar to the intermediate target of Buddhism) would eliminate that guidance, the leap from this observation to the assertion that all non-paralysed humans have something one could reasonably call a “moral core” is dubious: actions and inactions are often taken because of phenomena most people would see as quite distinct from morality, such as habits (see chapter 3), because others are taking them, or just because they are there to be taken. As a final example, willpower is implicitly defined on pages 70–71 as that quantity which causes us to resist changing our self-concept as we move group to group or situation to situation. Again, this is not a generally-accepted definition of willpower, and moreover it reduces the phenomenon of having multiple identities to a sort of disorder to be tamed, rather than a core part of what it means to be human (a proposition explored more fully in Frijters and Foster, 2017). Like the oblique references, these dubious assertions about and interpretations of familiar ideas cannot reasonably be claimed to illuminate anything for the reader — to the contrary, they are likely to irritate the reader — but they do aid the author in connecting more bits of humanity that he has read about and that can in some way be drawn, albeit kicking and screaming, into his sandbox.

Perhaps Markey–Towler’s description of the mind satisfies him not only because it draws together so much of what he has found himself interested in, but because it is self-referential at a metaphysical level. The entire book is a mini-version of his own mind as he models it, with a central core (the mind-as-network model),

several supporting structures (e.g., preference maps, how to rationalize indecision, the importance of substitutability), and many weaker connections to peripheral material (heuristics, learning, salience) that nevertheless are needed to create a satisfyingly full mind, replete with connections. Those connections will have formed, and thereby his present view will have emerged, as the author has experienced those “changes in individual relations” (with his parents, his wife, his mentors, thinkers long-dead, and so on) that he asserts stunningly on page 90 to lie “at the margins of how we think about the world.” In this sense, the book both presents and takes the form of the author’s view of his own mind.

Conclusion

In closing his Preface, written naturally after he had penned the body of the work, Markey–Towler remarks that “I’ve found [the book] extremely useful for my understanding of humanity and our interaction. I hope you will too” (p. xiii). Stated here, in a nutshell, is the essence of the problem with this book. It is written for the author, whose hopes for its broader usefulness are vague and disconnected from the actual content of the book. One might even say that like his mathematics, these hopes are gratuitous and self-justifying in their purpose, providing Markey–Towler with a conveniently unchallengeable target: usefulness. Sadly, with this book, he has missed wide of that mark. I hope that as his career unfolds he retains his enthusiasm for the world of ideas and tempers it, over time, with fealty to the more altruistic ideal of contributing useful ideas to the world.

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