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Serendipity Science

An Emerging Field and its Methods

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Samantha Copeland · Wendy Ross · Martin Sand
Editors

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 Springer

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The editors would like to dedicate this book to those who have studied serendipity before them, to those who have been developing serendipity science and to those who seek to know more about serendipity and its study. In particular, we want to mention the members of the Serendipity Society, who have shaped this field and who have found each other unexpectedly seeking the same things.

Foreword

Serendipity is fundamental to science. This quirky and intriguing phenomenon permeates across scientific disciplines, including the medical sciences, psychological sciences, management and organizational sciences, innovation science, philosophy and library and information sciences. Why is it so ubiquitous? Because of what it facilitates and catalyzes: scientific discoveries from velcro to Viagra, innovation of all forms, unexpected encounters of useful information, novel and important ideas, and deep reflection on how we, as individuals, organizations, communities and societies can take leaps forwards by seizing unexpected opportunities and ‘making our own luck.’

Serendipity is therefore a concept that transcends across scientific disciplines and unites them. It can be a powerful ‘stitch in time’ that saves more than nine; it can propel people and organizations forwards in new, exciting and most of all surprising directions. It may even be considered a product of human nature—feeding our curiosity, and our minds through knowledge-building and helping us move boldly forwards into the unknown.

This book, *Serendipity Science*, presents a range of perspectives on serendipity and its importance from across the scientific fields mentioned above. These perspectives are as varied as the fields themselves. They encompass key issues from how to express and communicate serendipity, to how to study it as it happens, to how to cultivate it. These perspectives also incorporate a range of approaches and outputs—theoretical models and taxonomies, methods and genealogies—reflecting the widespread embrace of serendipity across scientific disciplines. I hope reading this book encourages you to embrace serendipity too.

Why should you embrace serendipity? Because once you do, it will be forever part of you—encouraging you to make meaningful connections, adopt an open and curious mindset, broaden your interests and help others in doing so—by spreading a serendipity ethos to your colleagues, friends and loved ones to support their growth and nurture their aspirations.

This book is itself a potential source of serendipity; I hope reading across disciplinary perspectives on the subject will support you in making new, insightful, useful and possibly even unexpected connections between your scientific interests and the ideas in this book. I hope it will provide new perspectives that drive you forward in your thinking. Welcome to serendipity science.

Dr. Stephann Makri
Senior Lecturer in Human-Information
Interaction, City, University of London
and Self-proclaimed 'Prince
of Serendip'

Preface

This book has taken a bit of work, but has been much longer in the making than the relatively short while myself, my fellow editors and the authors of the chapters herein have been actually writing and editing and deliberating over its content. As we mention in the Introduction (Chap. 1), real credit ought to go to Robert Merton, as much as to Horace Walpole himself—while Walpole whimsically coined the term in a letter (see page xi for the passage itself), it was Merton who really delved deep into what it could mean as an explanation for how much of science really happens. The recent formation and growth of the Serendipity Society is but icing on that cake, baked by those who came before—the collectors, the proliferators and the artists of serendipity, who kept the word in circulation and brought out its magic by sharing stories and digging into history to find common elements in the narratives and seeking the traits of those who encounter serendipity’s wonders, so we might better know serendipity itself. This book represents a bit of a different path than has been taken in the past; greats such as Umberto Eco and serendipitists like Pek van Aniel have been well known for describing serendipity—but many of those who have joined the Society and who wrote for this volume represent the next step, understanding it in a way that will allow us to create the conditions for it to happen, and as a key to understanding how humans make progress in our complex world.

As the co-founder of the Serendipity Society, I have been amazed and intrigued by the expanding circle of researchers and practitioners who want to join our project. The ‘mission’ of the Society has been, from its humble beginnings in 2016, to promote and support rigorous research into the understanding and practice of serendipity. This book comes out of our first Society conference, hosted in London, UK by City University and co-organized by Wendy Ross (co-chair of the Society) and Stephann Makri (who wrote the Foreword, see page vii). At that meeting, only a few of the members of the Society were able to attend, and yet the group was diverse and animated, and the conversations wide-ranging and enthusiastic. What had begun as a mere website and collaboration by researchers who serendipitously met had become a node for a growing network of people who wanted to talk and know about serendipity. Being able to think and discuss it as an important and tangible phenomenon, and to debate its definition without having to justify its importance as

a topic of discussion, was a welcome relief to many there—we had found a crowd of our own. The same experience has been expressed by many since, upon finding the Society and participating in our events.

But more than a gathering of the like-minded, the Society has allowed many researchers and practitioners to connect to others in unexpected ways; there are collaborations and shared resources that have directly resulted from the Society itself and its activities, and which are producing new work in several disciplines. A canon of texts is forming so fast we cannot keep up with our simple website and volunteer force, and the quality of research is increasingly impressive, especially to those of us who began our work on serendipity by perusing through anecdotes and blog posts, before arriving at the work of key early researchers like, in my case at least, Sanda Erdelez (who wrote the Epilogue for this book, see Chap. 12). Not all who are in the emerging canon are members of the Society now, but many are, and many others who are emerging as sources of key insights into serendipity. Serendipity Science, that is, is one of the most interdisciplinary and mutually respectful fields of research I have encountered in my career. The Society and the fruits of its labour, in turn, have gone beyond anything I could have imagined when it began and has been led and shaped by its members into what it is now.

For this reason and others, I would like to extend my personal thanks not only to my co-editors, but we would all three like to thank the members of the Society who have contributed to this effort by reviewing the chapters within, offering insight and recommendations when needed, and whose enthusiasm for the topic has reassured us that the book is timely, important and necessary.

As editors, we would like to thank most of all the authors. Each of the chapters in this book is an original contribution, and the book as a whole, thanks to the diverse experience and expertise offered by its authors, offers its reader a broad scope of historical, cultural and disciplinary knowledge. The book was written over the course of the COVID-19 pandemic, and several of us suffered serious hardships during that time—so we would like to extend a further thank you, in particular, to those authors who struggled through to contribute, and who helped each other with reviews and support while writing. We hope you are as proud of the end product as we are.

And finally, we would like to thank serendipity researchers who have come before as well as those who will come after—your enthusiasm for the topic and ambitious desire to pursue such a ‘slippery’ subject makes it ever more worthwhile to continue pushing the boundaries of uncertainty and unpredictability in our own, continuing research.

Delft, The Netherlands

Samantha Copeland

Excerpt from a Letter from Horace Walpole to Horace Mann, 28 January 1754¹

... I must tell you a critical discovery of mine *à propos*: in an old book of Venetian arms, there are two coats of Capello, who from their *name* bear a *hat*, on one of them is added a flower-de-luce on a blue ball, which I am persuaded was given to the family by the Great Duke, in consideration of this alliance; the Medicis you know bore such a badge at the top of their own arms; this discovery I made by a talisman, which Mr. Chute calls the *sortes Walpolianae*, by which I find everything I want *à point nommé* wherever I dip for it. This discovery indeed is almost of that kind which I call *serendipity*, a very expressive word, which as I have nothing better to tell you, I shall endeavour to explain to you: you will understand it better for the derivation than by the definition. I once read a silly fairy tale, called *The Three Princes of Serendip*: as their highnesses travelled, [408] they were always making discoveries, by accidents and sagacity, of things which they were not in quest of: for instance, one of them discovered that a mule blind of the right eye had travelled the same road latterly, because the grass was eaten only on the left side, where it was worse than on the right—now do you understand *serendipity*? One of the most remarkable instances of this *accidental sagacity* (for you must observe that *no* discovery of a thing you *are* looking for, comes under this description) was of my Lord Shaftesbury, who happening to dine at Lord Chancellor Clarendon's, found out the marriage for the Duke of York and Mrs. Hyde, by the respect with which her mother treated her at a table. ...

¹ This passage has been quoted from Horace Walpole's Correspondence, Yale Edition online.

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Wendy Ross studies the role of material serendipity in higher cognitive processes such as insight problem-solving and creativity. She draws on a range of methods from eye-tracking and experimental psychology to focussed cognitive ethnography. She has recently co-edited the collection on serendipity: *The Art of Serendipity* (Palgrave). She is Co-Chair of the Serendipity Society and Vice President of the Possibility Studies Network. In 2021, she was awarded the Frank X Barron prize by Division 10 of the APA.

Martin Sand is an Assistant Professor of Ethics and Philosophy of Technology at TU Delft. In 2020, he was a member of the NIAS-Lorentz theme group on ‘Accountable and Explainable Medical AI’ at the Netherlands Institute for Advanced Study. Before, he undertook a two-year project on the topic ‘Moral Luck in Science and Innovation’ as a Marie Skłodowska-Curie-Fellow. He is a member of the scientific advisory board of the Journal for Technology Assessment in Theory and Practice and an editorial board member of the journal *Philosophy of Management*.

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ideas. For example, employees within the organisation spotted that farmers unexpectedly used their washing machine to wash potatoes—which resulted in a potato washing machine.

Other studies highlight the use of technology that screens for relevance (e.g., items that might be meaningfully related in unexpected ways) instead of similarity (Guy et al. 2015; McKay-Peet and Toms 2010, 2018). Some virtual platforms also allow users to defer serendipitous ideas and to bookmark items for later (McKay-Peet and Toms 2010).

Discussion

Based on our review of the literature and our related work (e.g., Busch 2022; Busch 2020a; Busch and Grimes 2023), we developed *a model of the process of cultivating serendipity* that highlights the role of different individual and organisational practices in both enabling and constraining the various steps involved in that process. Our review thus established that serendipity is not a singular event, but a process (and related outcome) that requires sagacity. It can be influenced by noticing unexpected moments, and turning them into positive outcomes via proactive decisions (Busch 2022; Busch and Barkema 2020; Denrell et al. 2003). The process of serendipity includes a trigger (for example, a person making an unexpected observation), a bisociation (linking the trigger to something relevant), and the cultural and structural features that help to enact that bisociation into an unanticipated outcome (Busch 2020a, 2021; Copeland 2018; McKay-Peet and Toms 2018; Napier and Vuong 2013; also see Merton, 1948).

While a specific random chance encounter is an *event*, serendipity is a *process* and related outcome (Busch 2022; de Rond 2014; Fine and Deegan 1996; McKay-Peet and Toms 2018; Merton and Barber 2004).⁴ The process—of trigger, bisociation, and enactment—unfolds at multiple levels of analysis (Busch 2021). Given that serendipitous bisociations often emerge from the interplay between agents and their environment, system-level conditions for serendipity are paramount. For example, these contextual factors can encourage people to question ideas and insights (Busch and Barkema 2020), foster people’s motivation to cooperate (Rauch and Ansari 2021), provide interactive physical and digital spaces that allow people to accidentally bump into each other (Amezcuca, et al. 2013), legitimise serendipitous insights (Busch and Barkema 2020), and provide funding opportunities for new ideas with unknowable risks (Huang and Pearce 2015).

For companies, we suggest that the ability to integrate, build and reconfigure internal and external competencies to facilitate serendipitous triggers, bisociations, and the enactment of serendipity can become a “dynamic capability” (Busch 2020a, b; de Rond et al. 2011). We suggest that it does so by enhancing the organisation’s

⁴ Trigger and bisociation may happen at the same time, and there can be feedback effects (Busch 2020a; also see Brown 2005; Busch 2022; Cunha et al. 2010; Merton and Barber 2004).

“absorptive capacity”—its ability to encounter new information and to integrate it into existing structures and processes—which can amplify innovation and learning (Zahra and George 2002). In this way, companies can turn the acceleration of serendipity into a strategic advantage, for example by focusing employees’ attention on the important role of the unexpected.

Limitations and future research. The purpose of this article was to give an overview of interesting serendipity-related research in the entrepreneurship, strategy, and innovation context. Our review is by no means exhaustive, and much work remains to be done in terms of conceptualising serendipity (see e.g., Busch 2022; Fultz and Hmieleski 2021). Furthermore, while we mapped serendipity as a linear process, it is clear that there are many opportunities for feedback loops within the process as well as the potential that steps within the process might happen simultaneously or, alternatively, draw out over years. Future research might thus explore some of the temporal dimensions of serendipity and the conditions that give rise to different temporal patterns.

Our review of the literature opens up a number of other valuable areas for further scholarly inquiry. First, although we suggested that organisations’ efforts to cultivate serendipity might act as a type of dynamic capability (de Rond et al. 2011), how and under what conditions is this likely to hold? Similarly, while our study denotes a variety of individual and organisational practices that can foster serendipitous triggers, bisociations, and enactments, it is also likely that such practices may be more or less effective in different contexts and at different stages of organisational development (Busch 2022). What are those contingencies that explain the efficacy of the various practices? How can individuals and organisations cultivate “skilled luck” or “smart luck”?

Furthermore, the emerging literature on entrepreneurial ecosystems and organisational sponsorship (c.f., Amezcuca et al. 2013; Cohen et al. 2019; DeJordy et al. 2020; Hallen et al. 2020; Spigel 2017; Thompson et al. 2017) offers a setting within which to explore important tensions within the process of “engineered” serendipity. Much of the associated literature is focused on how systems of support can be structured in such a way so as to increase the likelihood of productive entrepreneurial and innovative outcomes. In essence, there is an implicit assumption that systems which foster serendipitous innovation can be designed, replicating for instance, the Silicon Valley or Silicon Fen phenomenon globally. And yet it is equally clear that some of the most prolific historic sites of innovation have been those in which the systems emerged with little top-down design over decades and even centuries. Future research might, therefore, explore the conditions under which systems of serendipity might be designed in top-down fashion, and the balance that is needed between structure and chaos or coordination and freedom. Also, what are the implications for success measures of organisational sponsors of entrepreneurship (e.g., celebrating “effective pivots” rather than the number of companies “graduating”)? Further research could also explore how local community leaders can be legitimised and enabled by policymakers to facilitate local serendipity-enhancing networks (as opposed to overly structured, centralised support programs—see also Soto, Chap. 11 in this volume).

Furthermore, how can schools and universities integrate serendipity into their curricula? What is the role of approaches such as the Socratic method that focus on asking questions rather than solutions? How can scholarships be designed in more inclusive ways (e.g., not only monetary support but also including considerations around creating opportunity spaces for students)?

Moreover, contexts of high uncertainty (e.g., emerging markets) could provide a fertile ground for further research. Although few studies of entrepreneurship make explicit reference to the concept of serendipity, much of the literature is oriented around understanding the related problem of uncertainty and its effects on entrepreneurial ideation and action. For instance, it has become a well-entrenched assumption within the entrepreneurship literature that the survival and growth of enterprises depends on their ability to deal with uncertainty (Alvarez and Barney 2007; McMullen and Shepherd 2006; Ramus et al. 2017). Because early-stage enterprises and entrepreneurs often face exceptionally high levels of uncertainty as to which partners, resources, or co-founders they might need in order to ensure success, they are often forced to frequently and radically change their assumptions about the problem that is worth solving and the solutions that might effectively address those problems (Grimes 2018). Amid such uncertainty, the process of discovering, constructing, and reconstructing the opportunity and its respective components is often a matter of serendipity (Busch and Barkema 2021). In this way the entrepreneur's search to more clearly define a particular problem–solution dyad is subject to ongoing contingencies, which then lead to an emergent strategy (Harmeling and Sarasvathy 2013; Mintzberg and Waters 1985; Sarasvathy 2008). In larger companies, paying attention to weak signals allows managers to more quickly respond to emerging opportunities (Denrell et al. 2003; Liu and de Rond 2016; Teece et al. 1997; Winter 2003), which can play an important part, for example with regard to internationalisation (Kiss et al. 2020). Further research could explore these different contexts of uncertainty and how they might (or might not) provide a fertile ground for serendipity to emerge. This might be of particular relevance with regard to new technologies such as artificial intelligence (Busch and Grimes 2023).

Additional avenues of research could explore how to operationalise and measure serendipity in ways that make it more accessible to larger-scale quantitative studies. Much of the extant research tends to be qualitative or experimental in nature. First attempts to measure serendipity (e.g., Busch 2020a; Busch 2022; Erdelez 1999; Fultz and Hmieleski 2021; McCay-Peet and Toms 2012; Makri and Blandford 2012) have focused on particular aspects of the process. Interesting insights could borrow but also distinguish from related constructs and concepts such as originality (e.g., Grant 2017), novelty (e.g., Toms 2000), interestingness (e.g., Andre et al. 2009), absorptive capacity (e.g., Zahra and George 2002), or unexpectedness (e.g., Adamopoulos and Tuzhilin 2015). Given that serendipity is a process, exploring counterfactuals might also be a worthwhile avenue for further research.

Moreover, what is the link between serendipity and tackling global societal and environmental challenges? Given the complexity of societal and environmental issues (Busch and Barkema 2019), many of the solutions might be unknown a priori, and serendipitously emerge via experimentation (Busch and Hehenberger 2022). How

can companies “prepare” for this? Related questions could focus on the link between serendipity and inequality. Blind luck, social connections, inherited wealth masking as skill (Piketty 2014), or unintended consequences often play a major role in success, and the possibility to encounter serendipity is not equally distributed, as financial and other pressures can sap attention (Mandi et al. 2013)—see also Soto, Chap. 11 of this volume. Given that base levels of potential serendipity are very different depending on the respective context, how could they be improved for those that did not win the birth lottery? Research could also look into the role of “negative serendipity” (“zemblanity”; Boyd 1998; Giustiniano et al. 2016), the faculty of making unlucky discoveries by design. This might be a particularly fruitful line of inquiry, as some individuals and organizations might have (subconsciously) cultivated an environment that fosters zemblanity, thus potentially setting them up for failure.

Another fruitful area of exploration could be the role of culture in (cultivating) serendipity. How does the process of (facilitating) serendipity unfold differently across different cultural contexts? Given that local cultures and belief systems shape behaviours, attitudes, and values (Hofstede 1984; House et al. 2004), they presumably play a major role in the serendipity process. For example, in settings characterised by higher power distance (in which lower-ranking individuals tend to accept that power is distributed unequally), it might be more difficult to trigger serendipity, as hierarchical divisions might hinder the free flow of information and ideas. However, even in very hierarchical settings, innovative solutions can emerge (Nonaka 1991). These contextual nuances extend to whole industries—while in nuclear reactors failure tolerance is low, in more entrepreneurial settings it tends to be higher, and thus serendipity might be more favorable in the latter (Busch 2020a). Future research could explore related contextual questions.

Last but not least, how could serendipity be integrated into policymaking? First experiments have shown that initiatives such as cross-council cultural collaborations, the development of communities of interest linking local areas, and communities such as “friends of park” and police-resident liaison groups can help increase diversity and connect groups that would usually not connect (Rowson et al. 2010; also see Chanan and Miller 2010). How can policymaking empower local communities to create their own “smart luck” by connecting with the right people at the right time? How can cities and regions be designed as “ecosystems” that help produce “unexpected productive collisions”?

Conclusion

In this chapter, we aimed to revisit the planning vs emergence (and luck vs skill) debates by suggesting that not only is there room for synthesis in entrepreneurship, strategy, and innovation, but that it is critical to do so. The role of serendipity has often been discounted in organisational and management theory, even though it is a major driver for innovation and societal impact, and plays a crucial role in much of business and life. Thus, we recommend an integrated approach to education, training,

and skills programs that bridges the demarcations of polarising predecessors. In a fast-changing world, nurturing serendipity is a dynamic capability necessary for companies and individuals alike to not only survive, but thrive.

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