THE NATURE AND NURTURE OF TALENT

Prepare for a captivating journey into the depths of human potential and excellence in this scholarly work. Within these pages, discover evolving complexity theory (ECT), a unified theory of talent development that integrates a rich body of research and explores a wide array of talent-related phenomena. This theory challenges conventional wisdom, shifting the focus from genetics and environmental factors to the dynamic interplay of self-organized development and real-time person–environment interactions. This book provides a practical roadmap, emphasizing actions over genetic determinants, guiding readers toward the attainment of higher levels of excellence. Departing from traditional perspectives, Dr. Dai envisions human development as a self-organized journey toward higher coherence, reframing talent development as active participation in sociocultural activities from which one's individuality evolves, and directions and purposes are crystalized. Written in an engaging and narrative style, this work is essential reading for researchers, students, and professionals seeking a deeper understanding of human potential.

DAVID YUN DAI is Professor of Educational Psychology and Methodology at the State University of New York at Albany and the author of *The Nature and Nurture of Giftedness* (2010), which is a prelude to this book. He has published 13 books and over 130 articles and was the recipient of the Distinguished Scholar Award conferred by the National Association for Gifted Children in 2017.

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A New Foundation for Human Excellence

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Dedicated to the memory of my colleague and friend
Laurence J. Coleman (1941–2013)

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Foreword

As I read the lengthy proposal for David Yun Dai's book on the nature and nurture of talent, I had what felt like an insight – that what Dai was arguing about the development of the individual applied not only to the individual, and especially the gifted or talented individual, but also to the field of giftedness and talent itself. In particular, fields, like individuals, get off from origins that are almost an historical coincidence, next get onto certain developmental tracks, and ultimately find the tracks they are on influencing their long-term development. As a result, the historical accident of their origins, although long past, continues to influence their evolution many years after the originators of the field are gone. One often cannot predict well where the fields will go, any more than one can predict what will become of an individual. The events that transpire over time are just too unpredictable.

The field of giftedness, as we know it today, had its primary origins in the work of Sir Francis Galton (1883/1907/1973) in England. Galton had many beliefs, but key among them were that (a) human gifts and talents are an intrinsic property of the person, (b) they are inherited, and (c) they are immutable. Whatever you are born with is what you end up with.

Galton's views had a lot of appeal to those at the top of the socioeconomic heap. First, those at the top now "knew" they were there not merely by virtue of the accident of their birth, but also because that accident of their birth actually made them *better*. Their status meant something not just in terms of societal accolades, but also in terms of their alleged intrinsic worth as talented people. Second, they now "knew" that those who were at the bottom of the heap were there not just as an accident of birth, but also because that is where they deserved to be on the basis of their lack of intrinsic merit. And finally, where everyone was, they were going to stay. People's potential was set by their heredity and was inalterable. To people in power, this must have been music to their ears then, as similar arguments are to many privileged and entitled people today.

There were views in opposition to Galton's, most notably the views of the eminent French psychologist Alfred Binet. Although Binet and Simon (1916), like Galton, devised a battery of tests to measure intelligence, they took a very different approach. Whereas Galton measured psychophysical skills, such as acuity of vision, hearing, and touch, Binet and Simon measured higher-order thinking and judgmental skills, such as are used in normal school activities. A crucial difference, however, was that Binet believed that abilities are not simply inherited but rather are modifiable. He even proposed "mental orthopedics" to help children increase their skills. He did not live to follow up seriously on this idea.

Binet won the battle on testing; today's tests far more reflect the emphases on complex processes originated by Binet than the emphases on psychophysical processes touted by Galton. But a successor to Binet, Lewis Terman at Stanford University (Terman, 1916, 1925) would end up adapting Binet and Simon's test for use in the USA, but with Galton's notions about the relative unmodifiability of intelligence and related abilities.

Terman (1925) and his colleagues conducted a longitudinal study that showed that gifted individuals, as identified by testing children with his Stanford–Binet Intelligence Scales, excelled in almost every aspect of life, including not only professional accomplishments but also personal health, safety, and longevity. What better evidence could there be that giftedness is determined early, likely at birth, and that the trajectory is set in the early days of life, or even before birth? This mindset became entrenched in the field of giftedness (Sternberg et al., 2021a).

The Terman longitudinal study, known as the Genetic Studies Genius, was fatally flawed, not in just one respect, but in numerous respects. The study was done in California, mostly among socioeconomically advantaged children, most of whom were White; however, most important, the mere identification of the students as "gifted" provided them with the advantages that, throughout their lives, could create a self-fulfilling prophecy (Rosenthal & Jacobson, 2003), so that when predictive validation studies were done, the correlations obtained reflected not only any natural processes that might be operating, but also the direct societal interventions that result when children are labeled as "gifted" (Sternberg, 2022). Society, in effect, creates the correlation it expects, and then acts as though it has discovered rather than manufactured the correlation.

There have been many attempts to break out of the deep groove that the Terman work created, some of which are reviewed in compendia in the field of giftedness and talent development (e.g., Pfeiffer, 2018a, 2018b;

Silverman, 2012; Sternberg & Ambrose, 2021; Sternberg et al., 2022). But the practice of the field has been largely oriented toward identifying the gifted fairly early, sticking with the identification, and viewing it as a fixed and generalized trait.

As Dai points out, a countertrend emerged in response to the Terman tradition, characterized by the work of Anders Ericsson (e.g., Ericsson & Pool, 2017) and also his mentor, Herbert Simon (e.g., Chase & Simon, 1973). This view is that talent development can be understood largely, or even exclusively, in terms of deliberate practice and guided exposure to the environment. The problem with this view is that it simply is unsupported, even without doing one empirical study. Scientists sometimes become so tunnel-visioned that they miss what is obvious. Lots of people have tried to be like Wolfgang Amadeus Mozart, Jascha Heifetz, Albert Einstein, Paul Dirac, Pablo Picasso, Marie Curie, Jane Austen, or Martin Luther King. But no matter how many hours of deliberate practice they put into the effort, they never came anywhere close. And they will not. You do not have to test subjects in a science lab to know that being the next Albert Einstein is almost certainly not in the cards, no matter how hard one works.

In the years, decades, and near-century since the work of Terman (1925), there have been a number of approaches to understanding gifts and talents – psychometric, cognitive, socioemotional, biological, and others (Sternberg & Ambrose, 2021). I would characterize David Dai's evolving complexity theory (ECT) as harking back to an organismic approach (Goldstein, 1939) – an approach that seeks to understand a quality, in this case talent development, in terms of the organism, its interacting parts, and its interactions with the environment as well as with those chance factors that determined the time and place of birth. Karl Rogers (1995) also could be viewed as taking an organismic, personological approach, although in a way that traced human development with much less detail than Dai does in this book. The contemporary theory that is probably closest to Dai's is the bio-ecological account of Bronfenbrenner and Ceci (1994), a relationship that Dai readily cites.

Dai provides a series of ten propositions that undergird his theory. The propositions show how talent development can best be understood – and, arguably, only fully understood – in terms of the kind of organismic, or bio-ecological, framework he provides. Whereas the Bronfenbrenner–Ceci theory is a general developmental theory, Dai's theory pertains especially to talent development. Proposition 1 of Dai's (this volume) theory captures many of the essential elements.

> **Proposition 1a.** Talent is a structural and functional property of the person contextually and temporarily emergent through maturation and adaptive transactions with certain social-cultural environments, with ever-evolving complexity, and thus cannot be "explained away" by lower-level components that are part of the developmental system in question.

In a sense, the following propositions are elaborations on this idea. The theory is different from so many others in that it is organismic, nonreductive, nondeterministic, and cognizant of the many environmental, biological, cognitive, social, personality, and other factors that interact to lead to talent development.

What makes Dai's ECT theory especially attractive is that it flies in the face of much of contemporary "scientizing." When I took introductory psychology, I learned that one of the "essential" elements of a psychological theory is that it is reductive and parsimonious. Dai attempts to be neither in the construction of his theory. Rather, he attempts to capture the full range of common and idiosyncratic elements that lead each of us to become unique in the set of talents we offer the world. These talents are emergenic; they cannot be predicted much in advance, and they are also partially attitudinal. Much depends not just on one's mental and other resources, but on how one chooses to deploy those resources (Sternberg, 2021b, 2021c). If one wishes to understand talent development, the goal should not be to reduce development to a set of static or even dynamic components! Rather, one's goal should be to understand how the multiple facets of a person interact with the environment and with the circumstances in which people find themselves, often through no desire on their own part.

The field is very fortunate to have David Yun Dai making his brilliant contributions to understanding talent development. There is perhaps no other scholar, living or deceased, who has quite put together as complex, as detailed, and as comprehensive a theory of talent development as Dai has constructed.

Robert J. Sternberg

Acknowledgments

Writing this book is a labor of love, and after many years of prodding, digging, mending, I can finally see ideas coming together nicely, which brings good moments of happiness and some level of cognitive closure. Many colleagues and friends came to help on various occasions, who deserve mentions here. First of all, I would like to express my gratitude to Bob Sternberg for writing the Foreword for this book. Bob has been influential on my career since my graduate school years, and several collaborative opportunities he graciously offered me proved to be productive and important for my professional development. As one can witness throughout this book, here and there, Bob's influence on my thinking is visible.

Different from my other work, this book prominently features developmental research and theory by many distinguished scholars in the developmental field, to whom I would like to pay tribute. Mihaly Csikszentmihalyi's work, not just his flow theory, but many thoughts he expressed about optimal human development, gains traction in my work, evident in this book (e.g., his less-celebrated book *The Evolving Self*. In the Epilogue, I use a quote from the abstract of a prospective chapter Mihaly initially planned to write on human potential for the volume Bob Sternberg and I co-edited (Dai & Sternberg, 2021), an effort on our part to tap into insight and wisdom of leading scholars in the field. I regretted to learn at the time that he would not be able to finish what he started, not knowing that he was seriously ill and passed away about a year later. What a loss to the field! Frances Degen Horowitz, a distinguished scholar in developmental science, was another one who had to withdraw from the book project mentioned above. But, at my request, Frances did not forget to write a blurb for the edited volume (Dai & Sternberg, 2021) before she passed away at the age of eighty-eight! It is sad that we were not able to save Mihaly and Frances's precious final insight and wisdom. My hope is their intellectual legacy of combining humanistic concerns with scientific rigor will be preserved in the scientific discourse and research on human development. This book is in a way an attempt to honor their legacy.

Many esteemed colleagues helped me one way or another to shape the ideas and arguments of evolving complexity theory (ECT) since I initiated the thought of developing a systems theory of talent development about eight years ago (Dai et al., 2015), including the late Anders Ericsson and Joan Freeman, as well as David Henry Feldman, Howard Gardner, Linda Jarvin, Todd Kettler, Paula Olszewski-Kubilius, Keith Sawyer, Dean Keith Simonton, Heidrun Stoeger, Rena Subotnik, Frank Worrell, and Albert Ziegler. My lifelong friend Wu Yiyi, a historian of science and Adjunct Professor of Fudan University, also lent me a helping hand when I dealt with issues related to the history of science (e.g., the Needham Puzzle). I still remember Yiyi loaned me Dampier's (1966) classic book on the history of science forty years ago, when I was an undergraduate student! I would also like to thank several classes of our doctoral and master's students who attended my seminar on the gifted, talent, and creativity, which I offered several times before the pandemic. Through class conversation, they contributed to the evolution of ECT I present in this book.

Thanks are due to the State University of New York at Albany, my employer, for granting me a sabbatical leave, which enabled me to write up this book. I also thank the US Army Research Institute for Behavioral and Social Sciences (Basic Research Unit) for funding a research project on motivation and learning for which I served as Co-PI (with Dr. Ron Sun, who was PI). My empirical work reported in this book benefited from this grant over the past four to five years. Yukang Xue, Qi (Skyla) Sun, Hedayat Ghazali, and Lan Lan, doctoral students in our Program of Educational Psychology and Methodology, have provided valuable assistance for this book, in preparing the index, formatting figures and tables, and checking for the citation–reference match, among other time-consuming editorial work. I hope they learned something vicariously from the lengthy process of writing a scholarly book.

Last, this book is dedicated to the memory of Larry Coleman, my colleague and friend, who died of a heart attack while hiking in a mountainous area in Tennessee. I have long thought of making this book a tribute to him as a great person as well as a distinguished scholar. I am pleased to see my wish finally materialized (see the Postscript I wrote, "Remembering Larry," at the end of the text).

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