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Is One Dimension Enough?

A Response to Simonton's Varieties of (Scientific) Creativity (2009)

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ABSTRACT—*We admire Simonton's valiant attempt to bring all of creativity under a single dimension. We offer a view that is sometimes complementary and sometimes distinct from Simonton's model: Our own multidimensional amusement park theoretical model, which tries to integrate domain-specific and domain-general points of view. We eagerly await future research on Simonton's model and are curious of how his hard–soft dimension can be included into the creativity pantheon.*

Dean Simonton's (2009, this issue) article is a fresh example of the almost magical way he can take large quantities of data and turn them into interesting, challenging, and often controversial hypotheses. In this article, Simonton focuses his lens on one possible dimension of the variability found in creativity when looked at across all possible domains, from biology to biography, medicine to *manga*, journalism to jazz. He offers a unique way of thinking about all of creativity that is an analog of the hard–soft characterization often applied to the various sciences. What we would like to do in this commentary is pull back the camera and view the same general issues from a slightly different perspective, with the goal of providing a framework from which to evaluate Simonton's argument.

Simonton notes that the question of domain specificity/generality is a key issue in creativity theory, and his argument seems to come down squarely on the side of domain specificity. Focusing on the creative person rather than the creative process, he argues that the dispositions of creative thinkers in every field he surveys are distinctly different. However, domain specificity is messy—it would certainly be easier if there were "a generic creative process that transcends the particular problem-solving tasks of any given domain" (p. 441). But understanding creativity is not easy, and a "creative physicist is not the same

as a creative psychologist, nor is a novelist the same as a poet" (p. 442).

Simonton wants to tame all that confusing variability ("these investigations have produced too many results," p. 441) and bring it together under "one possible dimension that might successfully coordinate these disconnected data points," p. 442). Bringing all of creativity—creativity in physics and philosophy, in psychology and photography, in painting and poetry—together on a single dimension is his apparent goal. Certainly no can accuse Simonton of aiming too low!

Simonton's model is an exploratory one at this point, and we do not believe it would be productive to aim potshots at particular pieces of his evidence or argument at this early stage of theory development. There is no doubt that his case is stronger in the sciences—where he provides a number of interesting measures that can a least roughly be mapped onto a single line—than in the humanities. The extrapolation from his work in the sciences to the social sciences and the humanities is potentially problematic,[1] but we think it fair to await further evidence before making any firm judgments.

Our focus in this brief response is on what happens when a very rich field is collapsed onto a single dimension—and a very value-laden dimension at that. We think it useful to contrast Simonton's hierarchy with other taxonomies to consider what is gained and lost in these alternative perspectives.

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[1]Those toiling in the field of English literature will surely want to dispute Simonton's claim that a "history and English professor can take time off from research for other duties—such as assuming administrative positions—with less detriment to their productivity than holds for a professor of a scientific discipline" or that a "scientist in high-energy physics has to do a lot more to keep up with the leading edge in his or her discipline than does a scholar in Shakespeare studies" (p. 443). Perhaps the fact that "scientists in a given discipline agree on what constitutes a contribution to the domain" (p. 442) more than do scholars in the humanities or social sciences also means that the knowledge base in a field like Shakespeare studies is much more varied. Thus, although it may be easier for a Shakespearean scholar to overlook any one bit of research, staying abreast of a much more wide-ranging field might actually require more, not less, work. And the much lower "obsolescence rate" means that those working in the humanities must bear in mind a range of work produced over a much longer period of time, without the leisure afforded by a rapid obsolescence rate simply to forget last year's ideas. But we will leave it to writers in the humanities to argue this point.

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Our own amusement park theoretical (APT) model (Baer & Kaufman, 2005; Kaufman & Baer, 2004) is one such taxonomy. Like Simonton, we argue that creativity has definite domain-specific aspects (and also domain-general features), but our taxonomy includes multiple dimensions. There are domain-general level skills and dispositions that we call *initial requirements*, which influence creative performance in all domains to varying degrees (e.g., intelligence, an appropriate environment, and the motivation to create something new). The next level, *general thematic areas*, becomes somewhat more domain specific; our current conceptualization includes seven such areas (artistic-verbal, artistic-visual, entrepreneur, interpersonal, math/science, performance, and problem solving). These load to varying degrees on a single factor (the initial requirements), but also have considerable unshared variance (Kaufman, Cole, & Baer, 2009).

Moving further in the direction of domain specificity, we find *domains*. For example, the artistic-verbal general thematic area includes such domains as poetry, fiction writing, and journalism. Finally there are microdomains: For example, in psychology there are such subdisciplines as clinical, social, and cognitive psychology, each with its own distinct knowledge base and to some degree its own mode of thinking and analysis.

The details of this particular model are not important here, nor is ours the only such taxonomy. Feist (2004) has a somewhat similar, if less hierarchical, model; he uses the term *domains of mind* and has proposed seven distinct areas of creative thinking: psychology, physics, biology, linguistics, math, art, and music. Gardner (1999) has famously proposed eight areas that he calls *intelligences*, which can be interpreted as aspects of intellectual ability as well as areas of creative achievement (e.g., Gardner, 1993). Although these intelligences are somewhat different from the APT model's general thematic areas or Feist's domains of mind, the three theories have remarkable similarities, at least at the first level of domain specificity. (The APT model pushes the hierarchical structure much further than either Feist's or Gardner's model, but it is thus far best supported empirically at the level of its seven general thematic areas.)

These alternative taxonomies differ from Simonton's in two important ways: they are multidimensional, and they are value free. Regarding the latter, Simonton is not explicit in the value judgment he makes about the different end points of his continuum, but it is hard not to read a strong implicit evaluation in such statements as this one:

> Presumably most scientific disciplines become increasingly scientific over historical time (for review, see Simonton, 2002). However, circumstances may arise in which a given science might regress toward a lower spot on the hierarchical dimension. (p. 444)

Of course, one could argue that the "soft" end is no less important, advanced, difficult, or creative than the "hard" end, but it is difficult not to interpret "regress" and "lower spot on the hierarchical dimension" other than as rather explicit value judgments.

Our larger question, however, is not about values but about theoretical power or utility. We wonder just how much of the messy variability of the domain specificity of creativity can be captured on a single dimension? Putting aside the question of the validity of Simonton's hypothesis—accepting, for the sake of argument, that there might be a hard to soft dimension that runs not only through the sciences, but also through the social sciences and even to the humanities (with philosophy somewhat surprisingly falling between chemistry and psychology, at least according to the one measure Simonton offers)—we question how much of the variability captured by the concept of domain specificity might possibly be explained by this single dimension. Of course, Simonton is not arguing that this single dimension is all there is to know about the domain specificity of creativity, but by putting it forward he does claim that it can capture a significant amount of that variability—enough to make it worth at least temporarily ignoring all the other differences so as to focus on this one by itself. Future research will tell us how much of creativity, and especially how much of the domain-dependent variability of creativity, can be captured or explained by this one dimension. We believe this question, together with the obvious question of the validity of Simonton's hypothesis (which awaits future research findings), will be crucial in judging how much it can contribute to our understanding of creativity.

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