Giftedness and Genetics: The Emergenic-Epigenetic Model and Its Implications

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The genetic endowment underlying giftedness may operate in a far more complex manner than often expressed in most theoretical accounts of the phenomenon. First, an endowment may be emergenic. That is, a gift may consist of multiple traits (multidimensional) that are inherited in a multiplicative (configurational), rather than an additive (simple) fashion. Second, the endowment may not appear all at once but, rather, will more likely unfold via an epigenetic process. These 2 complications have consequences regarding such aspects of giftedness as the likelihood of early signs, the appearance of early versus late bloomers, the distribution of giftedness in the general population, and the stability and continuity of gifts over the course of childhood and adolescence. These complexities lead to a 4-fold typology of giftedness that has important practical implications.

Introduction

The concept of giftedness is intimately related to the concept of talent. In fact, the terms are sometimes used almost interchangeably. This near equivalence is seen in the dictionary definitions. Thus, to be gifted means to be "endowed with great natural ability, intelligence, or talent: *a gifted child; a gifted pianist*" (*American Heritage Electronic Dictionary*, 1992). Yet a talent is "a marked innate ability, as for artistic accomplishment" or a "natural endowment or ability of a superior quality" (*American Heritage Electronic Dictionary*). Hence, if these two terms are not synonymous, at least one can be viewed as a special case of the other. In particular, talent can be considered as a specific form of giftedness. Whatever the proper meanings may be, the terms converge on two important assertions. First, both hold that some persons distinguish themselves by extraordinary capacities or abilities. Second, both terms maintain that these exceptional qualities are in a certain sense *innate*, the literal *gift* of some form of *natural endowment*. Almost invariably, this innateness is attributed to genetic inheritance.

In addition to these two explicit aspects of giftedness and talent, two other characteristics are suggested by the dictionary defin-

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itions, attributes that are more implicit, but equally significant. First, both giftedness and talent appear to embody a stable trait of the individual—something like a person's eye color. Somewhere relatively early in life a youth is seen as possessing a gift or talent, and then that capacity, in accordance with other endowed attributes, merely exists as a static aspect of the gifted or talented individual. Second, a gift or talent seems to represent a unified capacity rather than an inventory of capacities. Hence, the gift for perfect pitch is often discussed as if it were a coherent skill, like the ability to wiggle one's ears. Admittedly, perfect pitch could very well be this simple. Nevertheless, other guises of giftedness or talent might be more realistically conceived as composites of several capacities. Indeed, the multicomponent mixture might even compass interests and values. In short, giftedness could be multidimensional, not just unidimensional. Once provision is made for the possible multidimensionality of giftedness, then a novel issue appears: How are the various components integrated to generate the genetically endowed gift or talent?

To sum up, talent and giftedness are probably more intricate phenomena than implied by dictionary. In this paper, I will delineate the most likely intricacies. I start with the innate sources of giftedness. In particular, I examine the complexities of genetic endowment. At the paper's close, I treat the practical repercussions of this richer perspective on talent and giftedness.

Endowment and Development

Because talent and giftedness are so closely related, the analysis of the genetics of giftedness is based on a published formal model that was dedicated to explicating the development of talent (Simonton, 1999, 2001). Indeed, this application requires only minimal modifications of the original model. Furthermore, even though the original model was defined mathematically, I focus here on the basic concepts underlying its assumptions and implications. In any event, this model requires that giftedness be examined from two interrelated perspectives: emergenic endowment and epigenetic development.

Emergenic Endowment

The model begins with the assumption that most manifestations of giftedness do not depend on the inheritance of just one trait.

Instead, most gifts are presumably so complex that they presuppose the concomitant possession of numerous distinct attributes. Expressed most simply, inherited capacities or "gifts" are normally made up of multiple components. These components encompass all physical, physiological, cognitive, and dispositional characteristics that aid the realization of exceptional accomplishments in the domain in which the person displays giftedness. Some of these constituent attributes primarily involve the acquisition of the requisite expertise, whereas other constituent attributes mostly influence the performance of whatever expertise that has been so acquired. To keep the discussion simple, let us suppose that these genetic traits each vary along a ratio scale. That is, each trait varies along a dimension that has a true zero point, where zero represents the utter absence of the trait from the person's genotype. This ratio scale corresponds to the situation in which each component is the product of numerous genes that can be inherited in any combination (i.e., polygenic with the possibility that none of the relevant genes are contained in the genotype).

In the majority of domains in which giftedness occurs, it is assumed that the multiple components operate in a multiplicative, rather than additive, fashion. In other words, the individual's hypothetical scores on the component traits are multiplied rather than added. This mathematical operation necessitates that if any single essential component is missing, then that type of giftedness will also be is missing. That is, if a given trait is really necessary for the learning or execution of an unusual capacity, then its absence holds veto power over the emergence of that capacity. For instance, if a person is born with an extraordinary athletic ability with respect to innate physique and physiology, but without any intrinsic fascination with sports, then the talent would remain nonexistent. Expressed differently, many types of giftedness may require a particular weighted combination of characteristics, each and every one having to be present for the ability to even exist. This configurational form of genetic endowment has been named *emergenic* (Lykken, 1982, 1998; Lykken, McGue, Tellegen, & Bouchard, 1992).

To the extent that giftedness is inherited according to this multidimensional and multiplicative process, it would manifest itself in a manner rather more intricate than is usually thought. Four complications deserve the most emphasis:

1. Although the diverse types of giftedness are often presumed to be domain specific (e.g., a gift for music is not the same as a gift for mathematics), there is no need to

believe that every genetic component that contributes to a person's giftedness is strictly domain specific. Even if some traits might be more or less specific (e.g., perfect pitch in music), other component traits may be quite generic (e.g., general intelligence or "Spearman's *g*"). As a result, the domain specificity of many kinds of giftedness rests largely on the unique configuration of necessary components, not in the components themselves. The genes that underlie one type of giftedness can therefore support the development of other types of giftedness. The genes would just participate in contrasting combinations. Furthermore, two varieties of giftedness might require the same essential components, but still be distinct because the gifts presume that those components have distinguishable weights (e.g., affiliated gifts, like music performance versus music composition). Ample evidence already exists that shows how inheritable characteristics can pertain to more than one domain of giftedness, but with differential emphases corresponding to the idiosyncratic needs of each domain (Simonton, 1999).

2. Two persons can exhibit the same overall level of genetic endowment in a particular area of giftedness without inheriting the same attributes in the same amount. This can occur because it is the product of the constituents that decides the magnitude of the gift. So long as no essential ingredient is zero, two individuals can feature entirely heterogeneous genetic profiles and still display the same summary degree of the gift. For instance, two painters could have the same multiplicative sum, but one might inherit exceptional sensitivity to form while the other inherits extraordinary color discrimination. Thus, the genetic endowments determining a particular domain-specific accomplishment are not necessarily uniform. Similarly, two persons can both be deficient in any gift for a given domain, but still display rather discrepant genetic profiles. This can happen because only one component needs to be missing in order to veto the development of the dependent ability, and yet the omitted component may not be the same for the two persons. For example, one person might fail as a violinist for lacking pitch discrimination, whereas another might fail for lacking manual dexterity. In sum, neither the gifted nor the ungifted are genetically homogeneous.

3. A commonplace assumption is that most physical and psychological attributes are normally distributed in the larger population of individuals. Similarly, the genetic characteristics that constitute a specific gift should also be distributed in the general population according to the same bell-shaped curve. If the separate traits were simply summed according to an additive model, then that composite would also be normally distributed. The outcome under the nonadditive or emergenic model is dramatically different: The product of several genetic constituents would not come close to being normally distributed in the population. On the contrary, any multidimensional and multiplicative form of giftedness would display a tremendously skewed distribution (Simonton, 1999; see also Burt, 1943; Shockley, 1957). At the lower end of the distribution, the largest proportion of the population would exhibit no giftedness at all, because these individuals would be missing one or more mandatory components. At the upper end of the distribution, in contrast, would be those few individuals who would be several standard deviations above the population mean in their endowment. Hence, extraordinary giftedness would be quite rare in any multidimensional domain. Considerable empirical data in fact indicate that the cross-sectional distribution of performance is most precisely characterized by curves that feature a strong positive skew rather than a symmetric distribution (Walberg, Strykowski, Rovai, & Hung, 1984). For instance, creative output in any artistic or scientific domain is described by such an elitist distribution (Lotka, 1926; Price, 1963; Simonton, 1997).
4. According to the proposed model, giftedness becomes much harder to predict than it would be were it defined as a homogeneous entity. Most investigators try to predict extraordinary performance using simple linear and additive models. To the degree that a particular gift is multidimensional and multiplicative, the resulting validity coefficients will be rendered smaller—even when all of the genetic components have been assessed with perfect reliability. Even more striking, family pedigrees do not provide useful predictive information in the case of emergenic giftedness. On the contrary, such giftedness must evince low familial heritabilities. Parents cannot bestow a gift upon their child unless the complete configuration of

> component characteristics is transferred. The chances of a 100% genetic transfer are virtually zero. In fact, equivalent gifts could only be received by identical (monozygotic) twins. This aspect of the emergenic model offers a means for detecting if a certain kind of giftedness is really multidimensional and multiplicative. Giftedness that displays high heritability for identical twins but absolutely zero heritability for fraternal twins must necessarily be identified as emergenic. Evidence of emergenic inheritance has already been found in behavior genetic studies of creativity, leadership, and other forms of giftedness (Lykken et al., 1992; Waller, Bouchard, Lykken, Tellegen, & Blacker, 1993).

The above expectations assume that a specific variety of giftedness is multidimensional. Even so, it is most likely that various forms of giftedness differ in their complexity. In other words, different types of giftedness may vary in the essential components that they require. Some kinds may presuppose only one or two genetic traits, whereas others may presume a dozen or more. This variation means that the foregoing implications become all the more prominent to the degree that a specific type of giftedness is multidimensional. Most important, the more complex gifts should display more heterogeneous trait profiles, more strikingly skewed cross-sectional distributions, and considerably weakened familial inheritance.

Epigenetic Development

According to the emergenic model, giftedness can become an appreciably more complicated quality. Even so, the model must be expanded to include another crucial complexity, namely, that genetic endowment does not emerge instantaneously at the moment of birth. Instead, genetic traits tend to follow innate epigenetic paths of development. This is the reason identical twins reared in separate homes still have the tendency to become more and more alike as they grow older. This convergence stands in stark contrast with what we would anticipate should the environment's impact increase with maturation (Simonton, 1999). As a consequence, each component that defines a given emergenic form of giftedness will tend to feature its own characteristic trajectory. This epigenetic curve will decide when the attribute's development actually begins, the rate of growth, and the age at which develop-

ment tapers off and finally ceases altogether. This implies that the emergence of giftedness must be dynamic rather than static. In fact, the very nature of an individual's gifts is constantly evolving during childhood, adolescence, and early adulthood. Four additional implications can be derived from this combined epigenetic-emergenic model:

1. Despite the fact that numerous investigators have searched for early signs of particular types of giftedness (e.g., perfect pitch for music), such a search is most likely futile for any type of giftedness that is both emergenic and epigenetic. The first essential component to begin development for one youth might be among the last to commence growth for another youth. Indeed, there can be as many different ways to initiate development as there are components underlying the acquisition and performance in a specific achievement domain. Only gifts that are defined by the additive integration of a small number of components would be expected to feature early signs with any regularity. For instance, the kinds of gifts that are shown by certain savants and prodigies—such as mathematical calculators and musical performers—should also be of the types that most frequently display this attribute.
2. The emergenic-epigenetic model offers a genetic interpretation for the crucial distinction between early versus late bloomers. According to an additive model, a gifted youth starts development when the *first* genetic component begins growth; whereas, according to a multiplicative model, giftedness does not commence development until the *last* component starts its upward trajectory. Therefore, in contrast to an early bloomer, a late bloomer may be someone who has at least one genetic trait that exhibited a delayed epigenetic onset. Because the component does not begin development until later than the norm, the multiplicative composite that defines the gift will have its appearance retarded. Admittedly, environmental factors could also account for late bloomers, but the model shows that the basis can just as well be genetic.
3. If the endowed ability for extraordinary performance in a specific domain is multidimensional and if each constituent trait is characterized by its own unique developmental path, then a person's optimal manifestation of giftedness will be unstable over time, that is, the specific

gift will dynamically alter with age. As additional components initiate their growth, the individual may manifest a greater capacity for some affiliated achievement domain. For example, a child might begin by playing piano, only to switch to composition, and with maturity end up as an orchestral conductor.

4. Unfortunately, given that giftedness is unstable over the developmental course, the potential exists for some youths to lose their gifts as they get older. The promising child prodigy may develop into the mediocre adolescent. In fact, the epigenetic model actually provides for two distinct types of developmental loss: relative and absolute (Simonton, 1999). Relative loss means that a person's degree of giftedness shifts its ranking relative to others who are the same age. This change in ordinal position can take place because others in the same cohort may have epigenetic growth curves with delayed onsets, but with accelerated postonset rates of development. Thus, an early bloomer can be overtaken by a late bloomer. Absolute loss in giftedness happens when at a particular time in individual development genetic components emerge that inhibit the future growth of the overall gift. For instance, a promising gymnast may experience an unfortunate weight gain in adolescence or a scientific talent may suffer the onset of mental illness. It is conceivable that the initial gift may completely disappear. The genes, operating epigenetically, cannot only give a gift; they can also take it back.

In summary, it should be obvious that giftedness can develop in contrasting ways for individuals who do not have identical genotypes. Two individuals with the same type and magnitude of giftedness may have acquired that gift via contrasting epigenetic paths, whereas two persons with utterly divergent kinds of giftedness might feature quite comparable childhood beginnings. Furthermore, even persons who maintained the same form of giftedness throughout childhood and adolescence might have exhibited divergent periods of spurts and lulls, with the consequence that their comparative standing on that gift might have altered during the course of development. Rendering the possibilities all the more unpredictably complex is the likelihood that diverse kinds of giftedness can differ in the number of genetic components essential to their realization. For example, the capacity to compose operas in all

likelihood requires more genetic capacities than the ability to play master-level chess. Those gifts that require more genetic components will necessarily display greater heterogeneity in the number of available epigenetic profiles. Moreover, in the case of the most complex varieties of giftedness, it becomes much more probable that the youth will have to be older before all of the essential components initiate and complete their developmental growth. Thus, whereas the simpler types of giftedness can emerge in childhood or early adolescence, the complex types of giftedness may not appear until late adolescence or early adulthood.

Implications: Consolidation and Extension

It cannot be emphasized too strongly that the foregoing discussion has concentrated exclusively on the genetic basis of giftedness. Yet there can be no doubt whatsoever that the environment plays an important role in the realization of that genetic potential (Simonton, 1987; Winner, 1996). Even so, it must also be stressed that the concept of giftedness, like that of talent, has a more elementary connection with biological inheritance. Accordingly, although recognizing the role of nurture, the place of nature must remain most fundamental. As a consequence, I now consolidate and extend the critical repercussions that can be inferred from the emergenic-epigenetic model of giftedness. To be specific, the implications ensue from the likelihood that numerous types of giftedness may be inherited according to the emergenic and epigenetic processes treated earlier. At the same time, it also should be acknowledged that some kinds of giftedness might not be inherited in the same complex manner. As a result, natural endowment or genetic inheritance may be involved in rather contrasting ways in different types of giftedness. These differences can be highlighted by offering a fourfold typology of giftedness, as depicted in Table 1. This typology starts with the postulate that diverse varieties of giftedness can differ along two principal dimensions.

First, while some kinds of giftedness are genetically complex, others are rather simple. Simple gifts demand comparatively few genetic attributes and, in some instances, could require merely one trait and, thereby, be considered unidimensional. Cases of rather simple gifts might include physical height and visual acuity. Complex gifts, in comparison, require numerous endowed traits and, hence, are clearly multidimensional. Possible cases might be

Table 1
Fourfold Typology Based on the Two Dimensions of Simple Versus Complex and Additive Versus Multiplicative Giftedness

	Additive		Multiplicative	
Repercussions	Simple	Complex	Simple	Complex
Trait profiles	uniform	diverse	uniform	diverse
Cross-sectional distribution	normal	normal	skewed	extremely skewed
Proportion ungifted	small	extremely small	large	extremely large
Familial inheritance	highest	high	low	lowest
Developmental trajectories	few	numerous	few	numerous
Developmental onset	early	earliest	later	latest
Identifiability	highest	high	low	lowest
Instruction/training strategies	few	numerous	few	numerous

Note. Simple types of giftedness are those in which the number of genetic components is small, perhaps even unidimensional, whereas complex types are those in which the number of components is large and, hence, highly multidimensional.

entrepreneurial and political leadership, as well as choreographic and cinematic creativity.

Second, the diverse kinds of giftedness can differ regarding how the genetic components are integrated. At one extreme, the components could combine in an additive manner. Under this scenario no trait has veto power over the emergence of the gift. A possible instance might be scholastic aptitude, as assessed by a student's scores on psychometric instruments. At the other extreme, the components can be integrated multiplicatively, that is, the specific form of giftedness can be emergenic. In all likelihood, most types of giftedness that support the most outstanding accomplishments are emergenic, including most forms of leadership and creativity.

In light of the above two dimensions, four broad categories of giftedness can be conceived: simple additive, complex additive, simple multiplicative, and complex multiplicative. As noted in Table 1, these four categories vary according to eight criteria:

1. *Trait profiles*: Simple forms of giftedness, whether additive or multiplicative, will feature component profiles that are relatively homogeneous. In other words, youths exhibiting that gift will have a very similar makeup with respect to the underlying genetic traits. Of course, the similarity maximizes for unidimensional forms of giftedness, that is, gifts that depend on only a single inherited component. In striking contrast, complex or multidimensional gifts, again, whether additive or multiplicative, would permit a tremendous diversity of profiles. For example, extraordinary visual acuity may not presuppose many genetic components, but a large number of potential genetic underpinnings would support exceptional leadership as president of the United States. This profile diversity is clearly illustrated by the contrasting personalities of three of the top chief executives in U.S. history: George Washington, Abraham Lincoln, and Franklin Roosevelt (Simonton, 1986, 1988).
2. *Cross-sectional distribution*: Given an additive model, whether simple or complex, and operating under the assumption that all relevant genetic traits exhibit a normal distribution in the general population, then the corresponding gift will also be normally distributed. Indeed, if the specific guise of giftedness is multidimensional, but still additive, it will still display an approximately normal distribution, even if the genetic traits do not always exhibit a normal distribution. In contrast, the cross-sectional distribution for multiplicative (emergenic) gifts will always be skewed, with most of the giftedness concentrated within a small elite. The more extensive the complexity of the gift, the more skewed the distribution will be, and more rare the elite that results. A potential example could be the ability to compose music in numerous genres, given that nearly one fifth of all music in the classical repertoire was created by just three composers, namely, Mozart, Beethoven, and Bach (Moles, 1958/1968).
3. *Proportion ungifted*: According to the additive process, no genetic component has veto power, and therefore the chances of anyone having absolutely no gift whatsoever would be almost zero. This low probability is especially the case for complex types of giftedness because only one nonzero component is required to support a minimal amount of giftedness. The larger the number of underlying

traits, the higher is the likelihood that one trait or more will be active. The situation is rather different in multiplicative types of giftedness. If just one component is absent, then giftedness is absent. That veto power must lower the odds that any person would exhibit giftedness when compared with an additive process operating with an equal number of genetic components. Furthermore, as the complexity of the gift grows, the likelihood of displaying giftedness declines, because the chances of inheriting nonzero values on every required trait also must decline. Expressed more concretely, the number of individuals who possess no innate potential in architecture or choreography should be far larger than the number of individuals who possess no innate potential in chess or javelin throwing.

4. *Familial inheritance*: The derivations resulting for applying this criterion depart significantly from the expectations derived thus far. Individuals have the highest probability of inheriting gifts if the gift is both simple and additive. Indeed, if a gift depends on just a single component—rendering irrelevant the distinction between additive and multiplicative integration—then the prospects are high that a child can inherit the requisite trait if one or both parents possess that trait. Nevertheless, as the number of essential components expands, the odds of inheriting some or all traits shrink. The probability gets even lower for those gifts that depend on multiplicative inheritance. For emergenic gifts, if one component is missing from the individual's genetic makeup, then the corresponding type of giftedness cannot appear. Furthermore, as the complexity or multidimensionality of the gift enlarges, the chances that the person will fail to inherit the complete set of traits proportionately increases. Thus, complex and multiplicative forms of giftedness are not prone to showing signs of familial inheritance, in contrast to what Galton (1869) tried to document in his *Hereditary Genius*. For instance, gifted choreographers should be quite unlikely to have offspring who are also gifted choreographers.
5. *Developmental trajectories*: Thus far the theoretical expectations came from the recognition that some kinds of giftedness could be emergenic—especially multidimensional (complex) and multiplicative. However, the poten-

tial operation of epigenesis is just as critical to a complete understanding of how giftedness develops. Assuming that each genetic component develops its own specific path within any given person, it becomes necessary to consider how the various components combine to generate the summary developmental trajectory for a certain variety of giftedness. By now it should be evident that the central factor is the gift's complexity, that is, where it falls on the continuum extending from unidimensional gifts to highly multidimensional gifts. If a type of giftedness is simple, then the number of possible growth trajectories is comparatively small. In fact, in the simplest situation of a unidimensional gift, only one trajectory is available, namely that of the single required component. Nonetheless, as the number of genetic ingredients increases, so does the number of possible developmental pathways. The patterns depend on the nature of the trait that displays an accelerated growth curve relative to the other traits defining the gift. A form of giftedness with a dozen different components will have available at least 12 different developmental patterns. Significantly, according this criterion, it does not matter whether or not the gift is the additive or multiplicative.

6. *Developmental onset*: Even so, the additive-multiplicative distinction returns to prominence when we must consider the age at which an individual starts to show signs of a specific kind of giftedness. If a given gift is inherited through an additive process, then it commences development when the first component begins its development. For the complex additive forms of giftedness, this onset will appear earliest because more components are available on which the youth can exhibit precocity. This situation reverses in the case of multiplicative gifts. In the first place, the emergence of the gift does not become conspicuous until every single component has commenced development. That delay takes place because there is technically no gift so long as a single necessary component is missing. It must be manifest, moreover, that as the number of requisite genetic components expands, the likelihood that all will have commenced growth at a certain time will shrink. As a consequence, the onset of the gift's first appearance will be exceptionally retarded for all forms of giftedness that are complex and multiplicative. In

line with this assertion, it is intriguing that, within classical music, achievement in more complex genres, such as opera, begins at a much later age than achievement in more simple genres, such as the art song, with a genre like the symphony having onsets somewhere between (Lehman, 1953).

7. *Identifiability*: I realize that the forgoing implications may be a bit theoretical. Happily, the last two derivations pertain to the more practical consequences of the emergenic-epigenetic model of giftedness. The first implication concerns identification, that is, the capacity to identify those individuals who possess special gifts. As is apparent from Table 1, the four categories of giftedness display distinct patterns regarding this capacity. Identification is easiest and can be implemented most early in the case of simple, additive gifts. This is the case because such gifts depend on just a few components, and the type of giftedness starts to appear as soon as the first trait launches growth. Identification becomes more difficult for complex types because more components have to emerge before it is possible to anticipate the particular growth trajectory. Identification becomes even more insecure for multiplicative forms of giftedness. Because all traits must begin development before the gift can, as a whole, be said to exist, the particular form of giftedness cannot be identified until the complete set of genetic traits is in place. In fact, a predictive error will result if identification is based on a subset of the components, with no assurance that the full set will appear. Needless to say, this identification problem becomes all the more difficult in those forms of giftedness that are extremely complex. Thus, the identification of a multidimensional gift, such as architecture, will be more elusive than the identification of a simpler gift, such as chess.
8. *Instruction or training strategies*: The next practical consequence involves the optimal means for nurturing a specific type of giftedness. Once we have correctly identified gifted youths in a particular domain, how can we foster that gift? The essential assumption here is that nurture must conform to nature. Thus, instruction, training, coaching, education, and other possible interventions must not only fit a given kind of giftedness, but they must also comply with a person's unique trait profile, which

represents just one realization of all allowable profiles for that type of gift. Accordingly, the number of potential instructional or training strategies correlates positively with the number of permissible profiles. So the pattern of results shown in Table 1 parallels that given for the criterion of trait profiles. It does not matter if they are additive or multiplicative, simple gifts having few potential profiles will necessitate a smaller range of interventions than will complex gifts that feature a large supply of available genetic profiles. Consequently, instruction or training techniques will have to be more numerous for highly multidimensional forms of giftedness in comparison to those gifts that depend on much fewer trait dimensions. This contrast can be best appreciated if we try to think of ways to intervene to help a youth overcome potential weaknesses. The more multidimensional the form of giftedness, the larger is the possible number of weakness patterns, and thus the larger is the number of distinct strategies that must be available to change those weaknesses to strengths.

Summary

To sum up, the consequences presented in Table 1 imply that the phenomenon of giftedness is far more complicated than often imagined. To the extent that the emergenic-epigenetic model describes the inheritance and development of giftedness, then a particular gift cannot be understood without first discovering if it is additive or multiplicative and if it is simple or complex. Naturally, the phenomenon of giftedness is even more intricate than even this model suggests. After all, I have only scrutinized the genetics of giftedness—on the developmental complexities of natural endowment. The analysis would become all the more complicated if I were to incorporate environmental factors explicitly into the developmental model. Nevertheless, it must be obvious that to the extent that a specific gift operates according to emergenic inheritance and epigenetic development, the complications are already far more prodigious than implied by most dictionary definitions.

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