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## Chapter 36

# The Elusive Muse: Understanding Musical Giftedness

Roland S. Persson

**Abstract** Many labels exist to outline musical giftedness or aspects of it; a profusion resulting from different epistemological positions, disagreements, and the considerable complexity of the issue. In this chapter, musical giftedness as a sub-cultural attribute is discussed as well as the problems inherent in attribution by consensus procedures. Based on available research a conceptual model of musical giftedness is outlined based on domain generality and domain specificity, thus proposing an understanding of musical giftedness as a set of core skills and sets of key skills, particular for specific domains. The question of heredity is brought to the fore as is the significance of accumulated practice over time. Differences between the development of Western Classical musicians and popular musicians are demonstrated. Recent research on giftedness identification is also discussed followed by a concluding overview of potential research pitfalls as the understanding of musical giftedness continues to be explored.

**Keywords** Musical giftedness · Musical talent · Musical capacity · Musical intelligence · Domain generality · Domain specificity · Heredity · Genotypes · Phenotypes

### Making Sense of Nomenclature

Any effort to define musical giftedness must first deal with nomenclature. An individual superior than

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R.S. Persson (✉)  
Jönköping University, Jönköping, Sweden  
e-mail: roland.persson@hjk.hj.se

a majority of others in one or more musical domains has prompted the use of a number of different labels, often used quite loosely in the literature. This is also true, to some extent, of giftedness research and gifted education in general (cf. Gagné, 1985; Ziegler & Raul, 2000). The many available labels reflect not only differing epistemological worldviews but most certainly also disagreements and the considerable complexity of the matter at hand. However, I propose that many of these labels can be more or less subsumed under either genotype (genetically determined potential) or phenotype (the developed and observable behavior resulting from a certain genotype). In addition, there are also terms in use, which comprise every musical activity or aspect of musical behavior (see Table 36.1). While nomenclature relating to either genotype or phenotype is usually scientific, the all-inclusive terms are more commonly used outside the world of science.

### Genotype Labels

Among labels proposed as more or less genotypes in nature are musical aptitude, musical capacity, and musical intelligence. *Aptitude for music* is considered to consist of one general or several fundamental cognitive skills, which can all in various ways be identified by standardized tests (Shuter-Dyson & Gabriel, 1981; Shuter-Dyson, 1982). It has been suggested by Gordon (1995) that musical aptitude has a qualitatively different basis than nonmusical aptitudes. He terms this basis audiation, which is “to hear and to comprehend music for which the sound is no longer or never has been present. Audiation is to music what thinking is to

**Table 36.1** The variety of labels used in the literature of musical behavior

Genotype	Phenotype	All-inclusive terms
Musical aptitude	Musical talent	To be musical
Musical capacity	Musical ability	To be “unmusical”
Musical intelligence	Musical achievement Creative musical talent Musical expertise Musical excellence Musical eminence Musical elite talent Musical genius Musical competence	

language” (p. 173). Audiation as a term, however, is not widely spread or used. To speak more generally of musical and the mind, which several researchers prefer, then “the musical mind” seems a more user-friendly term (Bamberger, 1991; Sloboda, 1985; Storr, 1992). *Musical capacity* is used interchangeably with aptitude in the literature. *Musical intelligence*, however, is a more recent expression (e.g., Bamberger, 1991). Arguing that music is an intelligence proper may well be a valid claim per se (Gardner, 1983), but it is my observation that the popularity of the term has spread worldwide for other reasons than the theoretical appropriateness of the term. Music has been declared a panacea of sorts for being effective both in therapeutic intervention and as a means to boost cognitive efficiency. While music as therapy in various ways has won considerable recognition in the scientific community as well as in medical practice (e.g., Bunt, 1994; Unkefer, 1990), music as having somehow “magical” effects on cognitive functions—particularly spatial task performance—is much more controversial. The so-called Mozart Effect (Campbell, 2001; Rauscher, Shaw, & Ky, 1993; Tomatis, 1991) whereby listening to music, especially that of Mozart, allegedly raises short-term IQ, is hotly debated (Bruer, 2002) and often even declared a dubious, if not invalid, claim (Chabris, 1999; McKelvie & Low, 2002; Steele, Bass, & Crook, 1999). In the wake of this debate there arose an interest among educators whether music could in fact help improve achievement in other subjects more academic in nature. Consistent with findings that more or less undermine the Mozart Effect, the specific influence of music and art on more general achievement in educational settings has often also proven dubious or at the very least difficult to

substantiate (Eisner, 1998). However, Winner & Hetland (2000) having evaluated much of this line of research take middle ground. They argue that there is indeed evidence of causal links between, for example, music and spatial-temporal reasoning and learning to play music and spatial reasoning, and between classroom drama and verbal skills. But that there are no evidence of, and therefore no causal links, between arts education and verbal and mathematics scores/grades; art education and creative thinking; learning to play music and mathematics; learning to play music and reading; visual arts and reading; dance and reading; dance and nonverbal reasoning.

In this light, claiming that music is an *intelligence* provides music and art education with potential negotiation power in trying to fit the arts into a rationalist and technocratic social context, where the arts as profit and achievement enhancers would turn them into something more than “merely” being esthetical. In Winner & Hetland’s (2001) words: “Let’s stop requiring more of the arts than of other subjects. The arts are the only school subjects that have been challenged to transfer as a justification for their usefulness . . . Anyone who looks closely as we have done will see that these claims do not hold up unequivocally . . . The arts are a fundamentally important part of culture, and an education without them is an impoverished education leading to an impoverished society” (p. 5).

### **Phenotype Labels**

Among the phenotype labels are *musical talent* (Evans, Bickel, & Pendarvis, 2000; Freeman, 1984; Haroutounian, 2002) and *musical ability* (Coon & Carey, 1989; Shuter-Dyson, 1982; Howe, Davidson, Moore & Sloboda, 1995), both of which are also used interchangeably in the literature. However, they always refer to a manifest set of cognitive skills such as memory, aural discriminatory skills, and motor skills; skills that are assumed to be necessary for *musical achievement*, which is another term used in this context, the connotation of which is that which musicians have learnt on the basis of their aptitude (Shuter-Dyson, 1982). *Creative musical ability*, however, has a more specific use. Most often it refers to composing, improvising or arranging music (Brenneis, 1990; Piirto, 1992; Haroutounian, 2002). Note that while Jazz musicians

01 are expected to be creative in various ways as they per-  
 02 form (Andreas, 1993; Kenny & Gellrich, 2002; Press-  
 03 ing, 1988) the same is not typically true of Western  
 04 Classical musicians found performing in concert halls  
 05 all over the world. They do not normally exceed the  
 06 general norm for how a certain piece of music is to be  
 07 played (Persson, 1993, 2000, 2004). To play “authentically”  
 08 means that the score, the interpretational mark-  
 09 ings added by the composer, and the believed style of  
 10 playing typical of a certain era constitute the more or  
 11 less absolute norm (e.g., Haskell, 1988). A typical concert  
 12 pianist, for example, pursues “reproductive art”  
 13 and is not creative—at least not when performing the  
 14 traditional repertoire (Polony, 1995).

15 Also among the phenotype labels are, I suggest,  
 16 *expertise* (Sloboda, 1991; Ericsson, Krampe, & Tesch-  
 17 Römer, 1993; Sternberg, 2000; Ericsson, Nandagopal  
 18 & Roring, this volume) and *excellence* (Krampe &  
 19 Ericsson, 1996; Sloboda & Howe, 1991; Trost, 2000),  
 20 which are terms that are being increasingly used in  
 21 reference to giftedness. However, they represent an  
 22 entirely different research tradition that, unlike other  
 23 traditions, does not usually view genetic potential as  
 24 crucial in developing musical skills. It is rather argued  
 25 that there are environmental factors that play a signifi-  
 26 cant role and that virtually any skill, honed extensively  
 27 and more systematically in comparison to an average  
 28 person may, under more or less optimal circumstances,  
 29 develop from novice to expert within a period of about  
 30 10 years – prompting the use of the so-called 10-year  
 31 rule (Simon & Chase, 1973; Simonton, 1992). In  
 32 this research context scientists on occasion also use  
 33 *musical eminence* (Barret, 2006; Simonton, 1989),  
 34 which is “much more than mere recognition” (Al-  
 35 bert, 1992, p. xvii). Eminence has a lasting impact  
 36 on the social context, and redefines or changes under-  
 37 standings, styles, or, even to a degree, history itself.  
 38 Subotnik (2000, 2003) has recently added a further  
 39 dimension to this array of music phenotype labels  
 40 as a result of studying extreme talent at the Juilliard  
 41 School of Music, New York. Beyond expertise, she  
 42 suggests, comes *elite talent*. One might argue perhaps  
 43 that elite talent—an extreme form of giftedness—is an  
 44 important prerequisite of becoming eminent and that  
 45 elite talent is the same as the nowadays rarely used  
 46 term *genius* (e.g., Kivy & Ky, 2002).

47 Furthermore, the term *musical competence* (De la  
 48 Motte-Haber, 1985; Deliège & Sloboda, 1996) is also  
 49 found in the literature. Although all-inclusive it tends

to be used somewhat loosely as well. It is originally  
 a social-psychological construct representing self-  
 efficacy: the inherent human desire to perceive oneself  
 as able (Sternberg & Kolligian, 1990). Observe,  
 however, that competence is a social construct in that  
 a musician’s experienced competence is also the result  
 of acknowledged ability by the surrounding social  
 context (Bandura, 1990). We are therefore generally  
 motivated to strive to feel competent by striving also to  
 be recognized as able or even highly able. Musicians  
 are of course, for a variety of reasons (Persson, Pratt,  
 & Robson, 1992), motivated to achieve, to gain, and to  
 sustain competence in their field of pursuit (O’Neil &  
 McPherson, 2002).

Finally, in use to describe human musical behavior  
 are of course *to be musical* and *musicality* or, by impli-  
 cation, to be “*unmusical*.” These are all-inclusive terms  
 comprising the ability (or inability) to play, sing, com-  
 pose, and to appreciate music and so on (Revesz, 1953;  
 Zuckerkandl, 1973).

In the following discussion the term *musical gifted-  
 ness* will be used when referring to individuals who for  
 any possible reason appear “more musical” than most  
 others; they learn musical structures quicker, have bet-  
 ter memory for music, more easily discriminate tonal  
 and rhythmic patterns, are more expressive, more emo-  
 tionally attuned to music, and more sensitive to timbre  
 and, depending on type of musical skill, also have a  
 propensity for efficient motor learning that surpasses a  
 majority of other individuals and so on. Implicit in the  
 term is also social recognition for market profit, which  
 might not be an issue early in a musician’s develop-  
 ment but certainly becomes an issue as they make mu-  
 sic performance their profession. Musical giftedness is  
 in a sense all-inclusive as a term also, but it is here in-  
 tended to integrate the knowledge of different research  
 traditions without taking an extreme epistemological  
 stance. The nature of musical giftedness will be dis-  
 cussed in greater detail further on and a conceptual  
 model of the nature of musical giftedness will be pro-  
 posed.

## The Difficulties in Defining Musical Giftedness

It is obvious from the variety of labels that are in use to  
 describe musical behavior that there is both contention,

perhaps also some confusion, what musical giftedness should be considered as. Music, after all, and its understanding as a cultural phenomenon has been the focus of scrutiny by philosophers, scientists, and mystics of different traditions, convictions and insights for very a long time.

One of the major controversies in defining musical giftedness, at least in modern times, regards whether one general capacity or several separate and more or less independent capacities underlie music as human behavior; which of course reflects the similar controversy regarding the nature of human intelligence (see Dennis & Tapfield, 1996; Howe, 1997). Seashore (1938), for example, one of the pioneers in studying music behavior, recognized musical ability as complex. He argued for several, more or less independent, specific abilities. Others like Wing (1941) would rather understand music as one general cognitive function; a notion which has fairly recently been echoed also in proposing that the human capacity for music is, in fact, not only a single general function but even a specific *intelligence* inclusive of all behaviors musical (Gardner, 1983).

Most likely both positions have merit. Music behavior is both something general and something specific. However, before suggesting what dimensions may be missing in early attempts to identify musical giftedness, and make an effort to actually understand what the complex nature of musical giftedness could be, there are other confounding issues relating to the attribution of talent that need to be addressed.

### ***Musical Giftedness as a Sub-cultural Attribute***

Research into musical giftedness has almost exclusively been pursued in one sub-cultural setting only, namely that of Western Classical Music. This leaves giftedness with regard to other cultures' music and musical expressions virtually unaccounted for. Musical giftedness—or as termed by most of the labels listed in Table 36.1 above—is therefore unavoidably a limited, if not ethnocentrically biased, attribute (cf. Triandis, 1990). In Europe, North America, Australia, Japan, and other countries cherishing a Western classical music legacy, a concert pianist or opera singer would be more likely to be regarded and talked about as excep-

tionally gifted rather than well-known popular music groups or artists such as Motörhead, Deep Purple, Judas Priest, U2, KISS, Backstreet Boys, Rammstein, ABBA, NSYNC, or Country and Western stars like Garth Brooks, Johnny Cash, and Dolly Parton, just to take a few random examples from different genres of Western music. Needless to say, these have *all* been recognized as gifted but *not* by researchers or music educators. Boyd & George-Warren (1992) discovered when they interviewed 75 contemporary and popular musicians, all of whom have made a name for themselves, that a few wanted to start out learning a formal and basic Western classical music skill to help realizing their dreams in another genre. Their classically trained teachers, however, did certainly not recognize them as gifted. On the contrary, they would not accept them at all, and sometimes even punished any effort to be unique and deviate from claimed Western classical music norms. Further formal music teaching became an obstacle to these popular musicians' goals and dreams. They left formal education in music to learn on their own and were in the end identified as talented by market agents instead.

In contrast to the gifted Western Classical musicians, popular musicians are much more likely to be identified by their listeners, their marketing agents, or by so-called talent search companies. Once identified they may be on their way turning into “superstars.” The nature of the giftedness definition then becomes entirely different from that so far proposed by educators and psychologists: He or she who has the greatest potential to generate profit has “talent”—quite irrespective of any attention to cognitive attributes and environmental precursors to excellence. They may even reach superstardom; a phenomenon which, according to Rosen (1981), is argued to exist “when relatively small numbers of people earn enormous amounts of money and seem to dominate the fields in which they engage” (p. 849) and furthermore “small differences in talent become magnified in larger earnings differences with greater magnification of the earnings-talent gradient increases sharply near the top of the scale” (p. 846). Although this argued relationship between degree of talent and differences between talents and record sales is not clear (Adler, 1985; Hamlen, 1991), it nevertheless demonstrates the considerable interest of the market to search for talent in, for example, popular music. Needless to say the possibility of fame has attraction to many (Braudy, 1997). Would-be superstars also seek

01 out talent search companies of which, in time of writ-  
 02 ing this, the concept of “American Idol” and its many  
 03 spin-off TV productions in 100 different countries is a  
 04 very good example (e.g., Martin, 2006; or the original  
 05 website at <http://www.americanidol.com>). The idea is  
 06 that anyone who is convinced of their own potential as  
 07 a future pop star can come to advertised and scheduled  
 08 auditions where a screening takes place in front of a  
 09 jury of already famed and established artists and repre-  
 10 sentatives of the music industry. Jurors’ deliberations  
 11 and assessments, especially of participants who fail to  
 12 win the jury’s approval, in a somewhat ethically doubt-  
 13 ful way, become a major “entertainment value.” In the  
 14 end a handful potential superstars remain. One is voted  
 15 winner and receives professional assistance to launch a  
 16 career as superstar.

17 In order to more fully understand the notion of  
 18 musical giftedness science cannot afford to be sub-  
 19 culturally biased in this way and use as a research sam-  
 20 ple musicians from one type of context only—not for  
 21 as long as we argue there is only *one* type of musical  
 22 giftedness. Such a research sample would be unaccept-  
 23 able in almost any other kind of research if the desire  
 24 is to generalize results. Therefore, it is appropriate to  
 25 argue that we know only to some degree what musi-  
 26 cal giftedness is and that this knowledge is in a sense  
 27 *domain specific* in that it relates to Western Classical  
 28 music almost exclusively. We know much less how musi-  
 29 cal giftedness is constituted and manifested in other  
 30 cultures and sub-cultures.

31 Hence, any further study of musical giftedness as  
 32 a general phenomenon will need to extend samples to  
 33 include representatives of other cultures, sub-cultures,  
 34 and genres too. Also the social reality of being gifted  
 35 in music, especially when making it a professional car-  
 36 eer, needs to be considered and included. In a market  
 37 economy giftedness becomes a commodity and some-  
 38 one’s talent is assessed in accordance with their poten-  
 39 tial to generate profit. Probably three lines of research  
 40 need to be made distinct: (1) Music ability as domain  
 41 generality (the question of genotype); (2) musical ac-  
 42 tivities as domain-specific research per sub-culture or  
 43 culture; perhaps even per musical instrument (the ques-  
 44 tion of phenotype); and also (3) the social dynamics  
 45 of being musically gifted, which to an extent could be  
 46 understood as “success or failure in the light of sup-  
 47 ply and demand.” That which we crave sells, whereas  
 48 that which we do not want—for various reasons—will  
 49 have no attraction whatsoever irrespective of an indi-

vidual’s objective status of giftedness (see Subotnik,  
 Jarvin, Moga, & Sternberg, 2004; Persson, 2006). This  
 is also to some extent the direction that, for exam-  
 ple, research on creativity is taking: “Creativity,” say  
 Lubart & Guignard (2004), “is partly generalized abil-  
 ity, partly a set of domain specific abilities, and partly  
 a set of task-specific abilities” (p. 43).

### ***The Ambiguity of Social Consensus***

Focusing on the notion of domain-specific giftedness  
 in the Western classical tradition, there is yet another  
 confounding issue in defining what musical gifted-  
 ness means. To be identified as more or less gifted  
 in musical performance (instrument or voice) is of-  
 ten made by a consensus procedure. When prospec-  
 tive students seek admission to an institution for higher  
 learning auditions usually play an important role. Stu-  
 dents are asked to perform in front of a jury. The ones  
 considered—by deliberation and sometimes also by  
 vote—the most talented and promising are accepted  
 to the applied-for program at the conservatory or at  
 the department of music where the student wishes to  
 study. The same principle applies at a music contest: a  
 jury listens to all the contestants. A selection is made  
 by deliberations with the objective to identify the most  
 promising ones, who will be allowed to proceed to a  
 second round. In the end the jury nominates a winner.  
 On rare occasions there will perhaps be a tie between  
 two contestants, if jurors cannot reach consensus on  
 who out of two contestants considered the best should  
 win.

One could argue that the appointed winner is the  
 most gifted one. He or she has been evaluated thor-  
 oughly in a competitive setting and found to be the  
 most promising performer for the future. However, in a  
 consensus procedure subjective preferences come into  
 play and who should win or be admitted to a pro-  
 gram is often decided on the basis of a compromise—  
 what the *majority* of jurors decide. Unless of course  
 the jury is unanimous, which is not likely to happen  
 often. Thompson & Waterman (1990) report the many  
 contentions that have taken place in juries at the The  
 Leed’s Piano Competition over the years:

...celebrated pianists though they confer star status on a  
 competition, are not guaranteed to be good judges. Many  
 great pianists are great out of fierce single-mindedness.

01 Some great pianists only admire the qualities reflected  
 02 in their own playing. And cannot empathize with other  
 03 points of view ... The kind of college professor who  
 04 tends to appear on juries now are looking for a certain  
 05 kind of academic correctness. They should be looking for  
 06 attributes way beyond that—for that quality of revelation,  
 07 wonder, magic, that indefinable special something, apprehended  
 08 but not comprehended, something which is beyond technique (pp. 109–110).

09 Bastian (1987) reports in his study of competitions for  
 10 young gifted musicians in Germany that jurors sometimes  
 11 have personal biases too when ranking one contestant  
 12 higher than another. This makes an interesting comparison  
 13 to Kingsbury's (1988) unique study of the social dynamics  
 14 of an American, well-respected, music conservatory. He  
 15 found that students were usually attributed with talent  
 16 not necessarily according to what they actually did on  
 17 stage performing but according to which teacher they  
 18 studied with. The more famed the teacher the more  
 19 talented his or her students were considered. Thus,  
 20 inherent in the Western Classical music sub-culture is  
 21 also a complex pattern of biases.

22 While it is argued by some that aesthetic quality certainly  
 23 may be assessed successfully by consensus of experts  
 24 (Elliot, 1987; Machotka, 1982; Mills, 1987), the  
 25 procedure makes identification or ranking unreliable  
 26 for at least research purposes when in search of  
 27 "gifted performance" or any creative product for that  
 28 matter, the reason being that jurors base their  
 29 assessments on different criteria. Therefore, their  
 30 understanding of giftedness by necessity also differs.  
 31 That which is performance excellence to one juror is  
 32 not necessarily excellence in the eyes of another. It  
 33 has been known for some time that individuals vary  
 34 in how they appreciate art and music. Music preference  
 35 has been studied fairly extensively and several typologies  
 36 have been developed (e.g., Hargreaves, 1986; Hedden,  
 37 1973; Persson, 1993; Wing, 1941). While it is  
 38 simplistic to regard one's attitude to music as a  
 39 dichotomous dimension between affective and analytic  
 40 only (Hargreaves, 1986), such a simplistic dichotomy  
 41 nevertheless serves well in demonstrating the  
 42 opposing views in a music contest jury. They, too,  
 43 have preferences according to which they evaluate a  
 44 performance. Not infrequently do jurors, and Western  
 45 Classical musicians in general, actually adopt  
 46 dichotomous terms such as "academic, technical,  
 47 intellectual" and use these as opposites to being  
 48 "magical, emotional, artistic" in order to evaluate  
 49 what they have just heard (cf. Dubal, 1985). Bastian  
 (1987), for example, refers to contest performances being ei-

ther "technical, artistic, or a show-off circus act void  
 of artistry." While most Western classical musicians  
 would agree on how to define at least some key  
 aspects of musical giftedness (cf. Roberts, 1990;  
 Subotnik et al., 2004; see also Subotnik this volume),  
 they would most certainly disagree on which  
 performance was the "best", if all were presented  
 with a number of performers playing the same  
 piece of music, as was clearly demonstrated in a  
 study by Persson (1993).

## The Multi-dimensionality of Musical Giftedness

The following discussion endeavors to understand  
 what musical giftedness is as based on available  
 research. However, in so doing I will venture to  
 propose a conceptual model. The empirical knowledge  
 available has to my knowledge so far not been  
 brought together in a synthesis, but rather musical  
 giftedness has been explored within the boundaries  
 of different research traditions. The result, as  
 shown earlier in this chapter, has certainly been  
 one of promising beginnings but also one of  
 some confusion since researchers have taken  
 more or less an "either/or stance" on music  
 as a general ability or as several specific and  
 separate abilities; and the fact that educators,  
 musicians, and others tend to use labels given  
 to various aspects of the music phenomenon  
 differently. The expertise research tradition  
 avoids the use of giftedness as a term  
 altogether and has introduced the notion of  
 expertise as an alternative.

It is my contention that in addition to a human  
 general capacity for music there are also a  
 variety of cognitive, affective, and social  
 aspects, the numbers and significance of which  
 vary with the social context in which musical  
 skills develop. These aspects are not  
 necessarily acoustical in nature. There is  
 undeniably also a subjective dimension to  
 music, which as far as I know no objective  
 test of musical potential takes into  
 consideration. This subjective dimension—  
 termed *musical reality* by Persson (1993,  
 2001)—has become the focus of systematic  
 empirical research only in recent years  
 (Juslin & Sloboda, 2001). That there  
 exists an obvious relationship between  
 musical expression and emotional  
 experiences—irrespective of musical  
 genre and context—has been known  
 since Antiquity (e.g., Strunk, 1965).  
 Presumably also for as long as music

has been known to mankind, often in a religious context (Rouget, 1985). However, while musicians' subjective reality is real and very tangible to them and their educators (e.g., Juslin, 2001; Gabrielsson, 2001; Simonton, 2001), how it relates to the notion of giftedness requires further research, but because of its phenomenological significance it must nevertheless be part of a conceptual model.

Such a model of musical giftedness rests on a series of feasible assumptions, some of which are the direct results of research and others that are in need of research though their feasibility is at the very least implicated in the already existing body of empirical knowledge. In regard to the model discussed in the following, the assumptions concerning musical giftedness are (cf. Simonton, 1999; Oerter, 2003):

- Musical giftedness needs to be understood in terms of *core skills* common to all domains in which giftedness is to be studied or identified.
- Musical giftedness needs to be understood in terms of *key skills* specific to particular musical domains.
- Musical giftedness is dependent on heredity, but biologically determined potential must be stimulated and allowed to develop in a suitable environment to manifest.
- The nature of stimulation and development differs between musical domains.
- Everyone has musical capacity unless there is a neurological dysfunction. But everyone is not, nor can they become, musically gifted.
- Lack of individual and developed musical skill is not to be equaled to being void of musical capacity.
- Extensive practice of skills is the only means to develop a gifted individual to mastery of those skills thereby reaching full potential.
- Identification of musical giftedness is three-dimensional: (1) objective and generalizable, (2) subjective and individual, and (3) social as based on estimated value or appreciation in a context of supply and demand.

### ***The Core Skills of Musical Giftedness***

To find an exact and commonly agreed-upon definition of intelligence in the literature is a difficult quest, but suggestions range from the strangest of notions

regarding intelligence “as that which intelligence tests measure” to understanding intelligence as a neurological process, where differences in intelligence are understood in terms of the efficiency and capacity of the central nervous system (Eysenck, 1988; Kyllonen, 1996). More recent understandings focus more on intelligence function, namely to find and solve problems. Klein (1991), for example, defines general intelligence (*g*) as “a general reasoning capacity useful in problem-solving tasks of all kinds” (p. 6), whereas Sternberg and co-writers (2000) in arguing for another kind of intelligence explain that “practical intelligence is what most people call common sense. It is the ability to adapt to, shape, and select everyday environments. Intelligence as conventionally defined may be useful in everyday life, but practical intelligence is indispensable” (p. xi). Howard Gardner (1983), however, is the only one to date to propose in theoretical terms why mankind's ability to listen to, appreciate, and make and play music should be considered an intelligence in its own right. Gardner's criteria for labeling a distinct set of cognitive functions an intelligence are (1) potential isolation by brain damage; (2) the existence of savants, prodigies, and other exceptional individuals; (3) an identifiable core operation or set of operations; (4) a distinctive developmental history together with a definable set of expert “end-state performances”; (5) an evolutionary history and plausibility; (6) support from experimental psychological tests; (7) support from psychometric testing, and (8) susceptibility to encoding in a symbol system.

One indication that music is a separate intelligence in a Gardnerian sense is the nature of the William-Beuren Syndrome (WBS), a neuro-developmental genetic disorder characterized by peaks and valleys in mental function. There are substantial impairments in cognitive domains such as reasoning, arithmetic ability, and spatial cognition. But interestingly musical skills are more or less intact (Levitin et al., 2004; Hopyan, Dennis, Weksberg, & Cytrynbaum, 2001). Also magnetoencephalographic (MEG) and positron emission topographic investigations (so-called PET-scans) of the brain indicate that the brain does indeed process music differently than, for example, language (Tervaniemi, 2001). Furthermore, the history of music is replete with anecdotal evidence as well as studied cases of both prodigies (Revesz, 1925; Bastian, 1989) and savants (Miller, 1989).

01 The core operations of musical intelligence are  
 02 those often included in psychometrically constructed  
 03 musical aptitude tests: pitch, rhythm, tempo, timbre,  
 04 loudness, and spatial location (Levitin, 2000; Justus  
 05 & Hutsler, 2005). However, included in this set  
 06 of cognitive auditory functions should most likely  
 07 also be added emotional responses to music (cf.  
 08 Peretz, 2001; Hopyan et al., 2001). It is difficult to  
 09 imagine any kind of musical activity without emotional  
 10 responses being an integral part, although these are  
 11 clearly less important to some and more so to others  
 12 (Persson, 1993).

13 Musical intelligence is also beyond doubt subject  
 14 to development; that is, the skills involved can be in-  
 15 fluenced by training and change from none to some  
 16 by practicing them, and even further to an expertise  
 17 level given extensive practice and suitable environ-  
 18 ments (Sosniak, 1985; Sloboda, 1991). However, more  
 19 is likely to be required to actually be considered mu-  
 20 sically *gifted*. As discussed above, expertise scholars  
 21 generally do not recognize genetic potential as signif-  
 22 icant in developing higher levels of achievement and  
 23 accomplishment (Howe, Davidson, & Sloboda, 1989;  
 24 Sloboda & Howe, 1999). A majority of the scientific  
 25 community does however (e.g., Hassler, 1990; Thomp-  
 26 son & Plomin, 1993; Baltes, 1998; Gagné, 1999; Win-  
 27 ner, 2000). It is the assumption for this conceptual  
 28 model of musical giftedness also that development po-  
 29 tential is determined by genetic factors. Thus, musical  
 30 intelligence is separate from expertise behavior but not  
 31 unrelated.

32 Also, Gardner's (1983) claim that musical intelli-  
 33 gence has an evolutionary history is reasonably well  
 34 substantiated in the literature. But this is also the in-  
 35 telligence criterion most open to speculation. Evidence  
 36 for music as subject to evolution, and across species,  
 37 is for the time being best regarded as suggestive and  
 38 feasible rather than in any way absolute (Huron, 2001;  
 39 Justus & Hutsler, 2005). Primates, our closest evolu-  
 40 tionary relatives, appear indeed to process music much  
 41 like the human species does (Wright, Rivera, Hulse,  
 42 Shyan, & Neiworth, 2000), but they still do not make  
 43 music. Gorillas simply do not sing opera! But it has  
 44 been suggested that the song-like sounds of the gib-  
 45 bon monkey, bird song in general, and whale song  
 46 are related to human song *by function*, namely sex-  
 47 ual courtship (Miller, 1998). "Love me tender, love  
 48 me sweet" serenaded Elvis Presley in his time. "I am  
 49 wounded by love" lamented Guillaume de Machaut

some 700 years before him. "My only idol is Love"  
 is declared from stage in Hector Berlioz' opera *Ben-  
 venuto Cellini*. Is not love, in all its possible expres-  
 sions, what singers through the centuries have mainly  
 cherished in their art?

### **The Key Skills of Musical Giftedness**

The key skills of musical giftedness are more diffi-  
 cult to outline because there is as yet no agreed defini-  
 tion of musical domain specificity, which they are and  
 what constitutes them. However, while all musically  
 gifted probably share the musical core skills, which  
 additional skills they then need to excel in their cho-  
 sen field of pursuit must by necessity differ to some  
 degree. Researchers of musical giftedness could per-  
 haps learn from Sport Sciences, where the physical at-  
 tributes known to be significant for success in a certain  
 sport also are of importance when screening for poten-  
 tially gifted athletes (Adolph, 1978).

### **The Case of Voice Artists**

Popular music icon Rod Stewart, for example, tours the  
 world with great success (Ewbank & Hildred, 2004).  
 Thousands pilgrimage to his concerts and purchase his  
 albums. But he would be unlikely to have made it as an  
 opera singer, for the simple reason that his type of voice  
 on stage would never be accepted by opera aficiona-  
 dos. Perhaps it also lacks the potential to even develop  
 into a typical Western Classical opera voice. On the  
 other hand, most opera singers could also not take Rod  
 Stewart's place as an artist, because they do not have  
 his unique voice and type of stage charisma. A voice  
 is much more than merely the vocal chords. Its quality  
 is dependent not only on their size and shape, on the  
 technique learnt, practiced, and employed but also on  
 the acoustical environment afforded by the body and its  
 resonating spaces (cf. Sundberg, 1987). Hence, *physi-  
 cal constitution* plays a role too. In discussing voice  
 and giftedness with famed American opera singer Den-  
 nis M. Heath (personal communication, 13 Novem-  
 ber, 2006), a former student of the legendary opera  
 icon Birgit Nilsson among others, he defined "great  
 singing" to me as follows:

- 01 • *Voice quality*: resonant, clear, flexible, spontaneous,  
02 healthy, and with enough unforced volume to be  
03 heard.
- 04 • *Range and registration*: the need to know and use  
05 different registers
- 06 • *Flexibility*: an ability to effective fine motor control
- 07 • *Language*: students should learn the four basic lan-  
08 guage of the stage (German, French, Italian, and En-  
09 glish)
- 10 • *Musical style*: knowledge of different historical pe-  
11 riods and their musical practice.
- 12 • *Musicianship*: musical self-efficacy and general  
13 musical skills
- 14 • *Health*: taking care of one's voice as well as body  
15 and mind
- 16 • *Stage presence*: expression, communication,  
17 charisma

18  
19 Both voice quality and flexibility are physiological  
20 characteristics. To identify giftedness in singing with-  
21 out taking these two into account, at least in Western  
22 Classical music, would not make sense.

23 However, there are also different demands on the  
24 opera singer as opposed to the popular singer. The  
25 opera singer needs to hone his or her acting skills for  
26 a successful career (Halper, 1999), whereas the super-  
27 stars of popular music are currently more likely to be in  
28 need of considerable dancing skills—Madonna being  
29 the supreme example (St Michael, 2004). Both acting  
30 and dancing are non-musical skills in that they do prob-  
31 ably not relate to the core skills. They are each domains  
32 of giftedness in their own right (Van Rossum, 2001;  
33 Noice & Noice, 2002; compare also Simonton's chap-  
34 ter on cinematic talent this volume). In addition, the  
35 reasons for an individual to take on an acting career  
36 may be related to type of personality (Kavolis, 1963;  
37 Marchant-Haycox & Wilson, 1992).

### 40 **Physical Attributes in Mastering a Musical** 41 **Instrument**

42  
43 That musical giftedness is multi-dimensional is an im-  
44 portant point. It means that in order to specify what is  
45 domain specific in regard to musical giftedness there  
46 is a need to go beyond that which is auditory and also  
47 turn to social components and in addition also physio-  
48 logical components, depending of course on the func-  
49 tion and purpose of the musical domain. To this end

a few studies have investigated the physical attributes  
thought necessary to become a successful symphony  
orchestra musician, though with different outcomes.  
Lamp & Keys (1932) tested how certain physical at-  
tributes could predict aptitude for specific instruments.  
They chose length and slenderness of fingers (violin),  
evenness of teeth (clarinet), and thickness of lip in re-  
lation to diameter of the mouth piece (Brass horn).  
Thickness of lips, they found, had some predictable  
value, whereas neither slenderness of fingers nor even-  
ness of teeth seems related to success in their view. Mu-  
sicians themselves, however, beg to differ—strongly!  
Mills (1985) surveyed three professional symphony or-  
chestras to cull their observations and experiences of  
which physical attributes they considered essential in  
mastering a certain type of musical instrument (see  
Table 36.2).

Further research will have to establish whether mak-  
ing physical attributes a part of musical domain speci-  
ficity is a fruitful way ahead, and if so also how. If so,  
one issue that then needs to be considered is the *com-  
pensation phenomenon*, where someone void of appro-  
priate attributes actually succeeds exceedingly well in  
spite of this fact (e.g., Feldman, 1986).

Next to be considered for musical domain speci-  
ficity are motor skills, especially the finer motor skills  
needed for mastering musical instruments. Motor skills  
are, needless to say, also subject to heredity. Some will  
be able to learn them more efficiently and quicker than  
others. Fox, Herschberger, & Bouchard, (1996) write  
of motor skills that practice with feedback is funda-

**Table 36.2** Physical attributes considered significant for mas-  
tering musical instruments (adapted from Mills, 1987)

Types of instruments	Proposed physical significant attributes
Bowed strings	Overall physical coordination Broad left-hand fingertips Large hands (for cello and bass especially)
Wind	Overall physical coordination Even teeth, no protrusion, no gaps No double-jointedness Large hand span Thin lips (flute, trumpet, horn) Thick lips (trombone and tuba)
Harp and percussion	Tall Large hand span (harp) Fleshy finger tips (harp) No double-jointedness (harp)

01 mental in acquiring motor skills. However, heredity  
02 cannot be overlooked because with practice “every-  
03 one improves, but some improve more than others”  
04 (p. 356). A musically fairly capable individual there-  
05 fore, may well have all the cognitive attributes as well  
06 as emotive skills of musical giftedness but might simul-  
07 taneously be wanting in efficient motor learning, which  
08 in reality would mean having great musical ideas but  
09 not sufficient technical skill to manifest them. It could  
10 also be the other way round, which is more often talked  
11 about among musicians: someone has a brilliant, al-  
12 most unbelievable, facility for technique, but appears  
13 simultaneously to be lacking in musical ideas to com-  
14 municate. Pianist Paul Badura-Skoda (in Dubal, 1985),  
15 for example, observes that “today so many pianists  
16 play like robots . . . I can admire their technique but  
17 they leave their audiences cold” (p. 52). Another pi-  
18 anist of renown, Jorge Bolet, believes mechanical ap-  
19 titude is an inborn talent: “What I do at the keyboard  
20 has always been done with a certain amount of ease”  
21 (in Dubal, 1986, p. 78). Presumably, the musically  
22 gifted musician has both the cognitive attributes and  
23 a considerable facility for motor learning. But what ex-  
24 actly is the nature this “considerable facility”? A fair  
25 assumption would be that it corresponds to different  
26 levels of information processing constraints at a neu-  
27 ronal level as demonstrated by Eysenck (1988) in ref-  
28 erence to the possible cause for differences in intelli-  
29 gence level (see also Stelmach, 1982; Illert, 1993). It  
30 has been suggested that the maximum normal speed at  
31 which, for example, fingers can be made to move per  
32 second in scale playing is about 15–20 times. Note that  
33 the virtuoso repertoire often exceeds these constraints  
34 suggesting that some are indeed more able to exe-  
35 cute certain motor patterns than others (Sloboda, 2000;  
36 Collins, 2002).

37 Expressive skills are also an inevitable candidate for  
38 considering domain-specific musical gifted behavior.  
39 A good amount of research has been done in order  
40 to understand what musical expression actually is in  
41 terms of motor behavior (Shafer, 1976; Clarke, 1988;  
42 Palmer & Meyer, 2000). In fact, research has arrived  
43 at enough an understanding of motor programming  
44 in this respect that it is now possible to program  
45 computer algorithms and recreate by Artificial Intelli-  
46 gence means an artistically appealing and synthesized  
47 performance (Sundberg, 1988; Friberg, 1991). How-  
48 ever, cognitive scientists have remained true to study  
49 observed behavior only. While we know a great

deal of overt musical behavior, few have devoted  
themselves to the conceptual learning of music, which  
in all likelihood dictates how a piece of music is  
actually performed. Musicians from all eras, writes  
Persson (2001), “and no doubt in all genres of music,  
are indeed ‘sensors of emotions and sensitivity’, and  
subjectivity is, in a variety of ways, most probably the  
basis of the musical pursuit. It is helpful then, both for  
future research and in understanding the phenomenol-  
ogy of musical endeavors, to term the dynamic nature  
of this emotional basis from which musicians appear  
to draw motivation, construe artistic understanding,  
and generate performances, a *musical reality* akin  
to the Kellyan (1963) notion of personal constructs”  
(p. 284). How musical reality affects the nature of a  
performance in terms of tempo, dynamics, articulation,  
and so on is easily demonstrated by asking a musician  
to depict a certain event or scenario in the way that he  
or she plays (Persson, 1993). Manipulating the musical  
structure affects in various ways how the musician and  
his or her audience perceive the performance in terms  
of emotional response (Juslin, 2001). For example,  
it would be difficult to experience or communicate a  
feeling of sadness if tempo is very rapid. How then  
does a musical reality relate to giftedness? Given that  
emotionality, although construed in different ways  
by musicians, is an inevitable and intrinsic part of  
making and performing music, it could be argued  
that there are traits of personality involved in musical  
giftedness. Kemp (1996) in surveying the research on  
musical ability and personality found that musicians  
tend to score highly on Cattell (1973) *pathemia*, and  
*sensitivity* as well as on Eysenck’s (1967) *introversion*,  
the significance of which involves, Kemp suggests  
(1996), “the kinaesthetic sensation in musical per-  
formance, offering support to the notion that visceral  
brain activity is of fundamental importance” (p. 84).  
It is reasonable to argue therefore that as a further addi-  
tional aspect of domain specificity would be *emotive  
skills*: a propensity for emotional self-indulgence in  
a variety of ways, or hedonism, in that particularly  
musicians and singers would strive to optimize their  
emotional experiences when playing and that this  
strive, or perhaps need, would also be stronger in a  
gifted individual than in an able but not necessarily  
gifted musician. A relationship between music ability  
and altered states of consciousness has for exam-  
ple been amply demonstrated (Biasutti, 1990; Tart,  
1990).

The last potential aspect of musical giftedness domain specificity discussed here is *inner hearing*, which Campbell (1989) explains is “. . . [when] one using notation ‘hears what he sees. And sees what he hears’ once the skill has been developed (p. 304). Brodsky & Henik (1997) were able to demonstrate by a series of experiments first that musical inner hearing really does exist as a distinct form of cognition (see also Crowder & Pitt, 1992; Halpern, 1992; Gordon, 1995) and second that not all musicians in their research sample had this ability although they were all highly trained musicians. Similar results were obtained by Hallam (1995). She found that only two out of three musicians were able to hear music from the printed page of a score. While these researchers studied performers and surmised that inner hearing in one way or another is part of highly skilled musicians array of abilities, I would suggest differentiating that assumption by arguing that while inner hearing is no doubt a facilitating asset to performers who has the ability, it is crucial to a composer or a conductor. I propose that inner hearing particularly is a skill characteristic of a musically gifted composer or conductor. Danish composer Vagn Holmboe (1991) describes the genesis of his Symphony no. 6: “. . . without my knowing one note of the music. It stood quite clear to me as a larger totality in my consciousness; I knew how it had to be . . . sounds streamed forth now as if on their own; they sang in me, and I had to use all the abil-

ity and technique I had” (p. 39). Furthermore, Hans von Bülow, the first of the Maestro Conductors divided conductors somewhat facetiously into two groups: those with their head in the score and those with the scores in their head (see Bamberger, 1965). Conductors need to be able to hear the score from the score alone.

In conclusion, musical giftedness is a *multi-dimensional* construct. In order to make sense of the multitude of research into musical behavior and facilitate future research and a better understanding of giftedness in music, as opposed to music as a general capacity common to all, it needs to be studied as a domain-specific phenomenon.

There are clearly certain aspects of musical behavior that are more important in one pursuit than in another. Few of them have previously been brought together in a model outlining musical giftedness (cf. Chan, 2005). I therefore tentatively suggest the following division of domain-specific skills (see Table 36.3). This proposal cannot be understood as conclusive or exhaustive in any way. It is mainly an effort to piece together many years of research in several fields of study as well as to bring together scattered ideas and anecdotal assumptions of the musicians themselves. Also, the piecing together of the model unavoidably rests on my own subjective evaluation of available information: empirical and other. At the very least the outline can serve well as a heuristic for future research.

**Table 36.3** A suggestion how musical giftedness could be outlined in terms of giftedness domains and their domain specific skills. Note that this division pertains to Western classical music

Giftedness domain	Domain specific key skills	Type
<i>Voice performance</i>		
	Voice quality	Physiological
	Voice motor function	Physiological
	Acting skills	Personality
	Auditory skills	Cognitive
	Musical memory	Cognitive
	Emotive skills	Personality
<i>Instrument performance</i>		
	Motor function	Physiological
	Appropriate physical attributes	Physiological
	Auditory skills	Cognitive
	Musical memory	Cognitive
	Emotive skills	Personality
<i>Composing/Conducting/Arranging</i>		
	Auditory skills	Cognitive
	Inner hearing	Cognitive
	Creativity	Personality
	Emotive skills	Personality

## ***Musical Giftedness and Heredity***

As the musical upbringing of gifted Western Classical musicians has been systematically charted and is now well known and the significance of extensive practice, mentors, and supportive and stimulating environments well documented (Sosniak, 1985; Bastian, 1989; Manturzewska, 1990; Sloboda, 1991; Ericsson et al., 1993; Sloboda & Howe, 1991; Howe & Sloboda, 1991a,b), it seems that the question of nature versus nurture has rekindled with considerable intensity. However, while encouragement, opportunity, and extensive practicing certainly would mean a great deal to any musician, gifted or not, it is difficult to overlook individual limits to what can be achieved (Hunt, 1997). Arguments against genetic impact on various aspects of development come into a different light when compared with how sport scientists currently understand future talent identification in sports. McArdle, Katch, & Katch, (2001) envision the following regarding future gifted athletes:

The next decades . . . research will build upon the rapidly developing knowledge base about gene expression and the human gene map for performance and health related phenotypes. In the not-too-distant future, sport scientists will routinely incorporate simplified molecular techniques to assess and individual's potential for strength, endurance, and other traits important to exercise performance . . . Coaches and trainers in the future decades will undoubtedly apply technologies from molecular medicine to genetically screen young children for gene clusters that indicate potential for desirable athletic traits (p. 994).

Thus, sport scientists have a different basis and a somewhat different—and I think a more candid and correct—debate. There is no denial of the impact of genetic predisposition, but there exists a debate what to do with the knowledge we do have. Not everyone thinks screening on the basis of genetic predisposition is desirable, and it does raise a number of ethical questions (Murray, 1991; Mallia & ten Have, 2005; Miah & Rich, 2006). However, the current state of molecular medicine nevertheless makes it possible to envision genetic identification of talent given that the physiological and cognitive prerequisites for any given domain of pursuit are known. Surely music in this respect could not be much different than sports? To a degree musically gifted individuals such as performers and singers could well be looked upon as athletes.

Unfortunately hidden more or less political agendas sometimes interfere in deciding what is “true” and what is not, quite irrespective of what evidence actually suggest (Segerstråle, 2000). Never is controversy more rampant than when heredity is discussed. It would be more honest and definitely more correct, like in sports, to debate with regard to musical giftedness what kind of a future we wish to have rather than trying to construct a future based on ignoring certain facts

## ***The Nature of Stimulation and Development Differs Between Domains***

Kleinen (2002) argues that studying popular musicians will probably extend the scientific understanding of musical giftedness. He even goes so far as to say that the research effort to date has been “blocked by the cult of genius and other unreflected myths” (p. 8). Rosenbrock (2003) makes much the same observation and claim. It is worth noting again the parallel to the quest for understanding human intelligence. “In seeking to understand intelligence,” Sternberg (1988) suggests, “we should inhibit our desire to look in obscure nooks and crannies, and dampen our fascination with the unusual and the bizarre. Instead, we should look in the most obvious of places—ordinary people living their everyday lives—to gain some insight into what intelligence is, how it should be measured and how it might be improved” (p. 6).

Kleinen (1997) studied Jazz and Rock musicians and did indeed find differences between Western classically trained musicians, always strictly and formally trained, and popular musicians, who have more or less learnt their musical skills much on their own (Table 36.4).

Campbell-Robinson, Buck, & Cuthbert (1991), on the other hand, studied a number of local and traditional musicians in various countries. They also found that formal training in music was usually missing and that the early beginnings of their musical development tended to be a very lonely one:

The portrait we have painted of the local musicians we have interviewed is one of lonely, talented children who turn to music with an incredible dedication at an early age. Often their formal musical education, if any, is minimal, and they begin to train themselves, relying frequently on the help of other musicians, some of whom are family members. As adults our musicians see themselves as less

**Table 36.4** Some differences between the musical development of Western Classical musicians and Jazz and Rock musicians (adapted from Kleinen, 1997)

Variables of study	Western Classical	Jazz and Rock
Technique	Has highest priority	Feeling is more important
Social facilitators	Parents and teachers	Group members, friends
Social situation	Loneliness	Member of a group
Performance priorities	By notation and exactitude	By ear, by feeling
Nature of learning	Formal teaching by others	Learning on your own

bound by the traditional mores and values of the social surroundings, being both more tolerant and socially sophisticated than friends from the past who have pursued more mainstream occupations (p. 223).

Thus, a widened study of musical giftedness, differentiating research samples by encompassing different genres of music as well as cultures, could substantiate and extend the findings that, for example, well-known precursors of developing musical giftedness in a Western Classical music context (Howe & Sloboda, 1991a,b; Manturzewski, 1990; Sloboda & Howe, 1991) are different for talented musicians of other genres, sub-cultures, and cultures.

### ***Everyone Has Musical Capacity***

Shuter-Dyson (1982) concludes that “the ability to make and apprehend music is inherent in all humans, but in another sense aptitude varies among individuals and may set a limit on ultimate achievement, no matter how favorable the environmental influences nor how highly motivated the person” (p. 393). It is very difficult to overlook the notion of a human general capacity for music. All known cultures, present and past, have or have had music—as opposed to nonmusic (see Merriam, 1964)—as an integral part of that culture (Blacking, 1995; Cross, 2001). It is difficult to argue, for example, that an individual is not musical, since most people at least to some extent have all the perceptual and cognitive attributes considered particularly related to music. The few who are de facto “unmusical” are likely to be neurologically dysfunctional—congenitally or traumatically—in relation to this general music capacity (Kalmus & Fry, 1980; Ayotte, Peretz, Rousseau, Bard, & Bojanowski, 2000; Peretz et al., 2002; Stewart & Walsh, 2002). Humans are a musical species, and lack of individual skill is not to be equaled to being void of musical capacity (Blacking, 1987; Sloboda, Davidson, & Howe, 1994; Koelsch, Tomas, & Friederici, 2000).

Shuter-Dyson (1981) further points out that if Seashore’s (1919, 1938) idea of separate musical functions was accurate, intercorrelations between the tests included in the battery he devised to assess musical aptitude would as a rule be low and the search for underlying factors would yield specific ones. This has proven not to be the case. However, while these results may be true in a psychometrical sense, a test is also subject to construct validity. Is the way that Seashore operationalized his notions on independent abilities actually reflected in the test battery? What does it really measure? While high intercorrelations between the tested musical functions perhaps deflate the intentions of Seashore’s (1919) test battery assessing aural skills such as pitch, consonance, tonal memory, time and rhythm, it does not necessarily make the idea of multiple musical functions null and void. There may well be other skills at play, which were not considered by Seashore and others at the time; skills which are not necessarily tied to auditory perception as already demonstrated in this chapter on musical giftedness.

It follows of course that lack of individual and developed musical skill is not to be equaled to being void of musical capacity. Irrespective of whether general or specific musical behavior playing an instrument or singing first needs learning and practicing—supervised or by one’s own accord. Practicing therefore has attracted many researchers particular interest.

### ***Practice Makes Perfect***

It is not possible to even consider becoming an expert in any field without first having accumulated a considerable amount of time practicing the skills required to reach an expert level (cf. Ericsson, 1996). Several studies over the years have scrutinized musicians and their practicing. Comparisons were made, for example, between conservatory student violinists likely to become internationally recognized in due time,

01 good student violinists, and music teachers (Ericsson  
02 et al., 1993). By 18 years of age the difference in  
03 self-reported accumulated practice is considerable: the  
04 most promising students had invested 7,410 hours of  
05 practicing, while good students reached 5,301 hours  
06 and music teachers 3,420 hours. Note that practicing  
07 in the development toward expert levels is *deliberate*  
08 (Ericsson, Tesch-Römer, & Krampe, 1990). This  
09 means planned, strategic, and to some extent enforced  
10 practicing in that extrinsic motivation is stronger  
11 than intrinsic motivation. Practicing is not necessarily  
12 enjoyable, but there are events such as contests or  
13 concerts ahead for which practicing is necessary. So,  
14 musicians practice anyway. Less successful musicians,  
15 like amateurs, turn their practicing into something  
16 more enjoyable and interact with others more than  
17 practice systematically; an indulgence which, ac-  
18 cording to Ericsson et al. (1993), leads to little  
19 improvement in skill. As Harnischmacher (1997) puts  
20 it: "...practice times—without the extrinsic "push"  
21 of performance preparation—tend to be influenced by  
22 planning and action-oriented aspects of personality"  
23 (p. 84). Also, practicing must be kept up over time to  
24 maintain the skill (Krampe & Ericsson, 1996).

25 Beyond any doubt, behind every gifted musician is  
26 a considerable investment in systematic training of the  
27 skills required for their chosen pursuit. Expertise, or in  
28 Subotnik's (2000) terminology: elite level talent, does  
29 not come cheap!

### 32 **Identifying Musical Giftedness**

35 In surveying the literature on the many aspects of mu-  
36 sical behavior one issue stands out clearly regarding  
37 the identification of musical giftedness: early attempts  
38 by pioneering researchers to detect musical aptitude by  
39 psychometric testing are far from sufficient. The rea-  
40 son is that musical giftedness is not a matter of au-  
41 ditory cognition and perception only. However, in re-  
42 cent years, with further research and also because re-  
43 searchers have turned to other sources of data than  
44 what perceptual testing can provide; they have turned  
45 to musicians themselves to ask qualitative questions.  
46 The understanding of musical giftedness has as a result  
47 extended considerably. As has been discussed earlier,  
48 however, these efforts are still in their infancy since  
49 there is an urgent need to recognize that the notion of

musical giftedness by and large is biased toward West-  
ern Classical music and that social consensus assess-  
ment of talent, at least for research purposes, is too am-  
biguous to be of much value.

Musical giftedness therefore needs to be identified,  
and understood, along three dimensions: (1) as some-  
thing objective and generalizable, (2) as something  
subjective and individual, and (3) as something social  
as based on estimated value or appreciation within a  
context of supply and demand. Implied here is also  
that there are both commonalities and unique features  
to each domain of musical pursuit.

Shuter-Dyson (1981) has provided an excellent  
evaluation of the earlier attempts to identify musical  
giftedness, so better here to focus on more recent  
attempts to outline musical giftedness and what sep-  
arates the gifted from the non-gifted. These attempts  
have, more or less, all been impressed by expertise  
research and fully acknowledge the tantamount sig-  
nificance of practice and social precursors in order to  
develop excellence to its fullest in a musical domain.  
They have in addition also kept the significance of  
auditory skills. But apart from components such as  
these the understanding of musical giftedness has  
become more elaborate (Table 36.5).

**Table 36.5** Identifying markers for musical giftedness as sug-  
gested in the recent literature. Note that markers suggested by  
Winner & Martino (2000) and Haroutounian (2000, 2002) are  
culled from empirical studies, whereas Bastian (1989) and Sub-  
otnik et al., (2004) report musicians' own understanding of what  
musical giftedness is and/or what it takes to be recognized as  
such

Winner & Martino (2000):	Haroutounian (2000, 2002):
Early interest in musical sounds	Perceptual awareness
Musical memory	Perceptual discrimination
Perfect pitch	Metaperception
Musical generativity	Creative interpretation
Multiple music-cognitive representation	Behavior/ Performance
Sensitivity to emotion in music	Motivation
Bastian (1989):	Subotnik et al. (2004):
Expressive abilities	Persistence
Emotionality	Self-confidence
Learning with ease	Knowledge of Self
Musical memory	Socially skilled
Physical suitability	Self-promotive
Auditory skills	Learning with ease
Multi-skilled across domains	Risk-taking
	Intrinsic motivation
	Charisma

01 Winner & Martino (2000), as part of cognition, sug-  
 02 gest musical memory and perfect pitch as identifying  
 03 markers. They also state that musically gifted individ-  
 04 uals cognitively represent music in more ways than  
 05 non-gifted individuals (cf. Bamberger, 1991). In ad-  
 06 dition, they point out that an early interest in musical  
 07 sounds and perfect pitch are typical. The early inter-  
 08 est in musical sounds, or perhaps rather an oversen-  
 09 sitivity to sound, has been suggested by Noy (1968)  
 10 and Nass (1975) also. Perfect (or absolute) pitch, how-  
 11 ever, may not necessarily be associated with gifted-  
 12 ness. It is not an uncommon phenomenon. In one study  
 13 15% of the participants had perfect pitch (Baharloo,  
 14 Johnston, Service, Gitschier, & Freimer, 1998) and in  
 15 another 32% (Gregersen, Kowalsky, Kohn, & West-  
 16 Martin, 1999). It can be learnt by some and has been  
 17 demonstrated in both gifted individuals and individ-  
 18 uals with developmental disorders alike (Dixon-Ward  
 19 & Burns, 1982). When studying piano performance in  
 20 Sweden and Canada in the 1980s, I quickly learned  
 21 that more than anything the possession of perfect pitch  
 22 awarded social status. Students who did not have the  
 23 ability were usually in awe of those who did. Musi-  
 24 cally gifted individuals are generative. By this Winner  
 25 and Martino mean that they are able to transpose, im-  
 26 prove, and compose. It is worth noting that composer  
 27 and musician was often one and the same prior to the  
 28 twentieth century, and it was more rule than exception  
 29 that they improvised also. It is only quite recently in  
 30 history that musicians have become more or less spe-  
 31 cialized and, particularly, performance and composing  
 32 are regarded as unique professions. In popular music,  
 33 especially at the outset of an artist's career, this tra-  
 34 dition largely remains. Popular musicians tend to per-  
 35 form their own music. New to the signifiers of musical  
 36 giftedness Winner and Martino introduce sensitivity to  
 37 emotion in music. This is an important addition and  
 38 one that has been conspicuously absent from early sci-  
 39 entific attempts of trying to understand musical gifted-  
 40 ness.

41 Haroutounian (2000, 2002) produces a similar set  
 42 of signifying aspects of musical giftedness, but she  
 43 encompasses the cognitive skills by using several and,  
 44 in all likelihood, somewhat overlapping terms such as  
 45 perceptual awareness and discrimination, behavior and  
 46 performance, and metaperception. Perceptual aware-  
 47 ness and discrimination are considered "biological  
 48 givens." They are equal to musical intelligence and

involve, in Haroutounian's understanding, above all  
 a propensity for awareness of sound and listening  
 carefully. Motivation is perhaps an obvious issue to  
 consider, although motivation for pursuing a musical  
 career differs from one musician to another: (1) a  
 hedonic motive—the search for positive emotional  
 experiences, (2) a social motive—the importance  
 of group identity and belonging, and (3) achieve-  
 ment motives (Persson et al., 1992). In reference  
 to creative interpretation as one important signifier  
 Haroutounian (2000) writes: "The most decisive factor  
 of determining potential musical talent in children,  
 according to respondents in *every* interview, rested  
 on criteria that were related to the child's creative  
 and expressive involvement in musical activities"  
 (p. 146). The core skills of musical giftedness: audi-  
 tory skills and musical memory are subsumed under  
 behavior and performance. One important criterion  
 in Haroutounian's checklist is metaperception, which  
 is defined as the perceptual and cognitive process  
 in which the musician: (a) senses the sound inter-  
 nally, (b) remembers this sound, (c) manipulates  
 the sound to match expressive intentions, and (d)  
 communicates this creative interpretations of sound to  
 others.

Bastian (1989) presents an entirely different, but  
 complimenting, list of criteria culled from question-  
 naires answered by highly gifted young German mu-  
 sicians. Needless to say, cognitive skills like musi-  
 cal memory, learning with ease, and auditory skills  
 are central. But from musicians' perspective expressive  
 abilities are considered the most important skills by far  
 closely followed by emotionality; a musician's ability  
 and will to experience music affectively. These musi-  
 cians also, like the one's interviewed by Mills (1985),  
 argue for the importance of certain physical attributes  
 to facilitate mastering a musical instrument. One very  
 interesting finding by Bastian in this major research  
 project is the fact that a surprising number of the par-  
 ticipants were polymaths; they were multitalented (see  
 Root-Bernstein, this volume). Some played several in-  
 struments to a very high level, whereas others in ad-  
 dition to their instrument wrote poems also or devoted  
 themselves to visual arts—all pursued to a high level of  
 skill. One example is the following poem of a 17-year-  
 old bassoonist. The poem here is rendered in trans-  
 lation from German by the current author (appearing  
 anonymously in Bastian, 1999; p. 290)

## The homeless

Barely in sight he lies,  
chameleon of the city,  
between withered grass and leaves  
sees growing above him the sky

In green markings “founded by city. . .”  
to him belongs  
no bench in the park,  
only  
the sky  
in between

Already the bottle  
is hidden  
with which  
he would be able to change  
colors

The last, and currently the most recent study, discussed in this context is a study by Subotnik and her fellow researchers (2004; see also Subotnik this volume) on “secrets of success in music performance”. Questions posed to participants do not directly address the question of giftedness but rather what it currently takes to succeed as a professional gifted musician. This is an inventive way of enquiring about giftedness. It prompts respondents to account for aspects of being musically gifted rarely addressed in research. As valuable and welcome this is, it raises further questions also. Only one cognitive prerequisite is mentioned by the participants: the importance of learning with ease. All the other characteristics regarded as necessary relate, one way or another, to personality, namely persistence, self-confidence, risk-taking, intrinsic motivation, and charisma. However, the successful gifted individual, according to participants, must also be self-promoting, socially skilled, and have a considerable knowledge of Self—three characteristics, which in part could be subsumed as *ambition*. In this perspective, the successful gifted musician is well aware of market forces and the principle of supply and demand. The long-lasting image of the musician of the Romantic Era as the inspired, exalted and divinely touched prophet, has transformed into a more or less stout entrepreneurial business person aiming to negotiate his or her own contracts with the best concert agents around the world, taking every opportunity to

finding something that will further their career (see Shavinina’s chapter on entrepreneurial giftedness in this volume). Given that this really outlines successful musicians; that is, describes what respondents felt what successful gifted musicians actually are like rather than how they in their experience would need to be like, the suggested characteristics provide a most interesting comparison to Kemp’s (1996) overview of research on musicians and their typical type of personality:

Evidence . . . support the notion that introversion appears to be positively linked to levels of musical performance. In musicians, the trait appears to manifest itself particularly in a tendency to direct energy inwards, resulting in a reserved and introspective temperament. At the same time, however, it suggests considerable resourcefulness, self-sufficiency, and personal inner strength. The musician can be perceived as a “bold introvert” who possesses the capacity to be comfortable in solitude during long periods of practice but at the same time is able to mobilize sufficient degrees of autonomy in performance. This form of introversion appears to take on aspects of the “schizoid” personality, individuals developing their sense of control over aesthetic objects and generating a sense of their own omnipotence (pp. 49–50).

In addition, Rovics (1984) has found that musicians often suffer from a serious lack of self-esteem, while Storr (1972) regards the creative mind as schizoid. As such the creative individual is introverted and somewhat reclusive, using his or her creativity instrumentally to remain aloof from social contexts but yet uphold a sense of mastery, if not a sense of omnipotence.

It seems that the research on musicians’ personality to some extent speaks against the respondents interviewed by Subotnik and her colleagues (2004) suggesting a discrepancy between who musicians often are and the persons they perhaps need to be in a rationalist and market-oriented context (Ritzer, 1992). Celebrated violinist Nigel Kennedy (1991) came to study at the Juilliard School of Music in New York, after having been brought up musically by Yehudi Menuhin. He disliked the famous music school intensely and made the following observation: “Don’t misunderstand me, the Juilliard School was full of brilliant players all hungry to succeed, but it was their progress which preoccupied them and not the discovery of the music and its emotions” (p. 18). The multitude of research done in Performance Art Medicine focusing on musicians’ health hazards, physical and psychological, suggests that mu-

sicians generally do not fare well in controlled rationalist environments. They are prone to develop a variety of stress-related problems and anxieties (Ostwald & Avery, 1991; Nagel, 1993; Persson, 1995; Phyland, Oates, & Greenwood, 1999; Amadio & Tubiana, 2000). Another line of research has looked at the relationship between what Redfield-Jamison (1993) terms “the artistic temperament” and above all manic-depressive illness. She poses a question worth considering, namely “if manic-depressive illness and its associated temperaments are relatively common in artists, writers, and composers, and if the illness, at least to some extent, an important part of what makes the work what it is, what are the implications of treating the underlying disease and its temperaments?” (p. 241). In other words, if no emotional problems (or emotionality in more general terms), then maybe also no astounding creative production. Rothenberg (1990) makes similar reflections.

Irrespective of whether gifted musicians are at times psychologically disordered or not, psychiatric studies and observations of artists nevertheless reinforces the notion of the artist as an emotionally oriented individual further. That is to say, the introverted ones who have developed a considerable affective relationship to their music making are likely to be as far from “stout entrepreneurial business persons” as can possibly be, which in turn raises the question who are the persistent, self-promoting, charismatic, and intrinsically motivated risk-taking entrepreneurs that Subotnik and colleagues seek (see also Subotnik, 2003)? If, in Kennedy’s (1991) words, The Juilliard School of Music and other similar institutions “[have] the stench of raw ambition, of ruthless professional people only too happy to conform to whatever is musically suitable to succeed” (p. 18), then maybe these famous institutions of musical learning are not necessarily the most opportune places in which to find musical giftedness based emotive and creative skills?

Beyond any doubt, however, musical giftedness can be identified by its core skills. For this there is consensus. Musical giftedness needs also be identified by its key skills, but research is scarce and so far only in its infancy. Finally, identification must be understood as contextual. The attribution of giftedness is more that just inherent ability or capacity. Social acceptance and tolerance are also issues to consider

(Persson, 2006) and to my knowledge such research has not yet even begun.

## Concluding Remarks

By involving musicians, their teachers, parents, and mentors in the research process by interview and observation, thereby extending empirical knowledge beyond psychometric notions of ability, much has been gained. It is certainly of interest to know, at an individual level, how music is experienced; how motivational triggers, development, instruction, the nature of practicing, and so on, are understood and construed. However, there are pitfalls in this line of research, be it either quantitatively or qualitatively oriented. We cannot assume that respondents are always correct and that they always know themselves well enough to be able to establish for example causality. That which is true in a phenomenological sense may not correspond to how things actually are in a more objective sense. Sloboda, Davidson, & Howe (1994) term this problem “folk psychology”. One good example of the problem in question is asking different relevant groups what they believe makes an individual musically gifted. This is what researchers Evans, Bickel, & Pendarvis, (2000) did. They found that students attribute much of their success to innate talent and hard work, whereas they also feel that family and friends have, in fact, discouraged their musical development. Their parents, on the other hand, report their children to be of only moderate innate ability and rather emphasize the significance of support and encouragement given by themselves and their friends. Who is correct? We cannot know without redesigning the study and follow a different research strategy.

Another possible pitfall in research, especially when involving young children in a study, is to use “grown-up” conceptions of what goes on in a child’s mind. What we interpret as “delight in musical sounds,” for example, may be nothing of the sort. It could simply be a child’s—*any* child’s—natural heightened attentiveness to novelty (Sloboda, 1985). I think similarly we must be wary of attributing aspects such intentional creativity, musical expression, and musical involvement also. There is certainly a danger that we see

01 what we wish to see and thus risking to invalidate the  
02 research.

03 A third problem in researching musical giftedness  
04 is of course, in view of what has been discussed in this  
05 chapter, whether the ones subject to study in various  
06 research projects are truly and objectively gifted? Con-  
07 sidering the bias towards Western classical music in re-  
08 search, the social forces of supply and demand, and the  
09 ambiguity of social consensus procedures, it would be  
10 somewhat presumptuous to argue that everyone studied  
11 as musically gifted actually is. At the very least many,  
12 perhaps most, have certainly been gifted—but perhaps  
13 in different ways due to lack of a general definition of  
14 musical giftedness!

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