

In Search of Musical Talent in Schools in Hong Kong: An Overview of Different Perspectives

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Current interests in the development of diverse talents in students have brought particular relevance and importance to the identification of musical talent in the Hong Kong school setting. An overview of different perspectives on what constitutes musical talent is first provided to set the stage for examining different assessment and identification approaches that emphasize musical aptitude, musical expression and performance, and creativity in musical tasks. It is suggested that the assessment of musical aptitude in terms of aural discrimination is a starting point, and should be followed by observation of students' creative interpretation in performance, improvisation, and composition. Other behavioral characteristics such as self-motivation and commitment crucial to talent

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development should also be taken into consideration in the identification process. Music education in Hong Kong and the corresponding musical talent identification procedures are then discussed in light of this overview.

Key words: musical talent, music education, talent identification, Hong Kong

The topic of musical talent has been examined, researched, and debated by experts across the fields of music psychology and music education since the turn of the century (see Haroutounian, 2002). The relevant issues include whether certain individuals are born with musical talent, whether one can acquire musical talent with proper training, and how one can recognize students who have musical talent or potential but have not had formal training. In general, the lay person tends to view musical talent as innate, and music teachers often say that they can readily identify students who have inborn musical talent (Winner, 1996). Specifically, these musically talented students are said to learn quickly, self-correct, and have high confidence when they perform (see Winner & Martino, 2000).

However, not all music educators and psychologists subscribe to this nativist view. In contrast, some have come to adopt an environmental position, and argue that high achievement in music is due to hard work, perseverance, and deliberate practice (Ericsson, Krampe, & Tesch-Romer, 1993; Howe, 1990; Howe, Davidson, & Sloboda, 1988). While it is generally agreed that hard work and practice are necessary for the development of musical talent, there is little evidence that hard work and practice are sufficient, and thus ruling out an innate component to musical talent seems to be unwarranted (Winner & Martino, 2000).

Regardless of whether one subscribes to the nativist or the environmental position, or a position in between the extremes, the question of whether one could recognize early signs of musical talent in children seems to arouse great interest among music educators and music psychologists. Interestingly, whether one could and how one could recognize early signs of musical talent seems to depend on one's individual perspective of what constitutes musical talent.

Musical Prodigies and Musical Savants

Perhaps one of the earliest signs that a child might be talented in music is the child's strong interest and delight in musical sounds (Scott & Moffett, 1977; Sosniak, 1985; Radford, 1990). In this connection, insightful information has been provided by studies and interviews with musical prodigies.

A prodigy is a child who performs at the level of a highly trained adult (see Feldman, 1993; Fisher, 1973; Radford, 1990). Prodigies occur most often in the field of music, and musical prodigies show outstanding abilities at a younger age (even as young as 3 or 4 years old) than other prodigies. They have remarkable perceptive ears, with many having perfect pitch, and extraordinary musical memory that allows them to reproduce complicated music after hearing it once or briefly examining the score (see Howe, Davidson, Moore, & Sloboda, 1994; Radford, 1990). Another important element that truly defines a musical prodigy is the ability to create a captivating performance dynamic with the audience (Fisher, 1973).

These observations are also supported by studies on musical savants who, despite their low general intelligence, have musical accomplishments resemble those of musical prodigies (Miller, 1989, 1999; Winner, 1996). Musical savants at an early age are often able to replicate tunes after a single hearing, singing in tune, and having an exceptional tonal memory. Thus, the recognition of perfect pitch in the special population of autistic individuals is suggested as a possible indication of musical ability (Winner, 1996). Miller (1989, 1999) also describes the savant musical ability as the sensitivity to musical syntax and structural aspects of music, as savants remember music with harmonic structure more easily than isolated melodies, suggesting that a conscious knowledge of the system of rules is not necessary. Taken together, an examination of the characteristics of prodigies and savants provides glimpses of the possibilities and mysteries that are part of musical talent.

Indeed, musically talented children, unlike their age peers, usually begin to sing at a younger age, and often before they can speak (Shuter-Dyson,

1986). Moreover, they are able to sing back heard songs with great accuracy, demonstrating their exceptional musical memory (Judd, 1988), and the ability to match pitches with precision, although perfect pitch is not consistently associated with musical talent (Winner & Martino, 2000). The extraordinary ability of musically talented children to play back what they hear is said to be non-reflective and tacit, as these children often report that they cannot imitate a piece if they think about it (Bamberger, 1986).

Research on the Development of Musical Talent

Apart from the studies with musical prodigies and musical savants, the studies with adult and teenage talented musicians are also revealing. For example, Bloom (1985), in a pioneering project, asked adults who achieved world-class recognition in the fields of music, art, athletics, mathematics, and science to recall and describe factors influencing their talent development. In this project, Sosniak (1985) focused on musicians, and reported the development of 21 concert pianists, highlighting the importance of family support, early training, and the different stages of instruction with different teachers. Although these concert pianists were not prodigies, they showed sensitivity to sound and good pitch discrimination, and had acquired the routine of practice from an early age. They all learned rapidly and well, and they craved for technical improvement and challenging musical opportunities.

In another study, Sloboda and Howe (1991) interviewed 42 talented teenagers enrolled in a specialized music school. These students were interviewed about their early childhood, influences in their lives, and their school environment prior to the specialized music school. Their findings were similar to those of Sosniak (1985) with concert pianists. In the two studies, few of the individuals showed very early signs of exceptional musical talent or prodigious characteristics. While a majority of parents did not have a musical background, there was considerable parental encouragement and support throughout the musical development of these musicians. In both

studies, musical talent and expertise developed from commitment, individualized instruction, and a consistent pattern of demanding practice.

Musical Aptitude and Its Assessment

If sensitivity to the structure of music such as tonality, key, harmony, and rhythm is considered the core ability of a musically talented child, the ability to sense and discriminate sound should be the core element of musical talent. Thus, to a music psychologist, the measurement of the ability to discriminate sound is an objective assessment of musical aptitude or musical potential prior to training, before factors associated with musical achievement could impact accurate measurement.

This musical-aptitude perspective generally follows the psychometric tradition in measuring and analyzing the sensory core of musical talent (see Gordon, 1995; Seashore, 1938). In this regard, musical aptitude describes the basic capacities that provide the keen discrimination of sound. A musically talented child can thus be defined as one who is fine-tuned in awareness and differentiation of pitch, rhythm, dynamics or loudness, as well as timbre or the different qualities of these sounds. The more discriminately the child distinguishes subtle differences in these components, the higher the child's musical aptitude.

Historically, the scientific analysis and measurement of human perception and discrimination of sounds began as early as the late 1800s by psychologists Helmholtz, Wundt, and Galton, among others (see Haroutounian, 2002). Perhaps, Seashore is best known for his 1919 publication of the landmark musical aptitude tests, the *Seashore Measures of Musical Talent*. Seashore (1938) describes musical talent as a hierarchy of attributes stemming from inborn sensory capacities that function from early childhood, and the basic musical capacities that constitute musical aptitude include tonal (sensitivity to melody, pitch variation, and harmonies), dynamic (sense of loudness), temporal (sense of time, tempo, and rhythm), and qualitative (sensitivity to tonal color or timbre). Seashore (1938) also

maintains that these capacities are largely inborn and are unaffected by training beyond the age of 10, the exception being tonal memory, which could be developed substantially through training.

The Seashore test battery includes subtests that provide an objective measurement of aural discrimination within each area of these sensory capacities, the assumption being that individuals with musical talent have an excellent “analytical ear” for music. Specifically, the Seashore subtests assess analytical skills that include the ability to make fine differentiations between tones of different pitches, length, and loudness and musical structures. Individuals are asked to listen to pairs of chords, intervals, rhythms, and brief melodies and to decide if they are the same or different.

The battery has been revised periodically over a 20-year period, and has generated both criticisms and interests in the further development of musical aptitude tests by music psychologists in the U.S. and Europe. In general, criticisms of the measures are often directed at the isolated or atomistic nature of the measurement of musical capacities, and the use of laboratory-controlled sounds rather than musical materials and instrumental sounds in the real world of music-making (Mursell, 1964). Other criticisms have focused on arguments that musical aptitude tests should not assess analytical ability such as a good musical memory and an ability to differentiate chords and melodies. Rather, aptitude tests should assess other qualities more closely predictive of high creative achievement in music such as musical reasoning (e.g., Davis, 1978), or qualities of expression and affect in music such as the ability to respond emotionally to music (e.g., Teplov, 1966).

The Seashore test battery has also stimulated the development of a variety of musical aptitude tests, all being variations of the basic standards of measurement established by Seashore. Particularly noteworthy is Gordon’s (1986) development of a series of test batteries capable of measuring musical aptitude from kindergarten through twelfth grade. Gordon (1986) bases his measurement of musical aptitude on the concept of “audiation,” which refers to the ability to comprehend music or derive musical meaning for which the

sound is not physically present (as in recall), is no longer physically present (as in listening), or may never have been physically present (as in creativity and improvisation). These test batteries include the *Primary Measures of Music Audiation (PMMA)*, the *Intermediate Measures of Music Audiation (IMMA)*, and the *Advanced Measures of Music Audiation (AMMA)*. Gordon (1995) recommends the use of the comprehensive *Musical Aptitude Profile (MAP)* as early as the fourth grade when musical aptitude stabilizes if one intends to seek exceptional levels of aptitude in the lower grades.

The use of testing of musical aptitude in education and research settings has been widespread during the 1970s and 1980s when musical aptitude tests were actively developed. However, the debate over the value of the use of such tests continues in the field of music psychology (Boyle & Radocy, 1987; Kemp, 1996; Sloboda, 1985). In terms of cost effectiveness, the more comprehensive tests such as *MAP* are long and tedious to administer. Besides, these aptitude tests generally focus on listening to isolated tones and snatches of sounds rather than the musical context one listens to as a musician.

Musical Expression and Performance

While musical psychologists and educators generally agree that musical aptitude assessed by the sensitivity to the structure of music is the sensory base of musical talent, they also agree that there is much more to consider and explore beyond purely sensory capacities or aural discrimination. Persson and his colleagues (Persson, 2000; Persson, Pratt & Robson, 1996), for example, have found that musicians judged pieces in terms of their emotional responses, and that their positive emotional experiences with music prompted them to become musicians. The features that carry the emotional and dramatic message of music are the non-notational, expressive properties of music, such as register, timbre, loudness, articulation, and phrasing. In this regard, sensitivity to these non-notational aspects or the emotional message of music could be a better indicator of musical talent than is sensitivity to the notational aspects (see also Kirnarskaya & Winner, 1997).

Kirnarskaya and Winner (1997), in their study, have found that most people, including those with high levels of music training, responded to music analytically rather than expressively. Regardless of whether they were trained or untrained, they grouped passages of music according to analytic structure rather than expressive properties. Only concert performers grouped according to expression as opposed to equally well-trained music educators who, presumably less talented since they did not become performers, grouped analytically. Thus, it has been argued that sensitivity to expressive properties may be a marker for inborn musical talent, as formal musical training does not foster an expressive ear for music.

However, in assessing or identifying musical talent, the psychometric or musical-aptitude approach has traditionally focused narrowly on the sensitivity to analytical and notational aspects of music, and sensitivity to expressive properties has been relatively ignored. In recent years, Gordon (1995), in his comprehensive *MAP*, has included the assessment of musical sensitivity (phrasing, balance, and style) that emphasizes the expressive and creative aspects as a basic factor of musical aptitude, in addition to tonal audiation (melody and harmony) and rhythm audiation (tempo and meter), which emphasize the structural aspects of music.

While musical aptitude may measure musical potential, it has been argued that musical talent can only be realized through performance (see Sloboda, 1994, 1996). Performing musicians and music teachers would generally agree that musical talent evolves from training and development. A child may have a high musical aptitude, but the development of musical talent relies on commitment, physical capabilities, teacher guidance, practice, and performance. Thus, the recognition of musical talent through performance makes good sense, given that a musician always communicates through performance, which is a phenomenological experience between the performer and the listener.

Specifically, sensitivity to the structure of music allows the child to remember music, to play it back with ease either vocally or with an instrument, and to transpose, improvise, and compose. The performer

communicates a personal interpretation through the medium of music to a listener who shares the interpretive process through listening and experiencing the performance. In this manner, the dynamic of performance is created in the mutual aesthetic experience of listener and performer (Haroutounian, 2002).

In the same connection, Sloboda's (1996) studies of expertise performance provide insights into the process of music-making in the musician's mind. He describes performance along two broad dimensions of technical and expressive performance. Technical skills are necessary for performance, but a technical performance is dull and lifeless without expressive skills. Expressive skills give value to the performance, and an expressive performance draws the listener to points of interest in musical structure and nuance. Expressive performance, through constant practice of skills, may have an element of automaticity when the performer can mobilize a large repertoire of expressive responses in performance to respond to specific musical structures without overt conscious deliberation. A student performer in an audition scenario may show different performance styles of expressivity. According to Sloboda, perhaps the combination of distinct performing style and automaticity explains what constitutes musical talent.

In emphasizing performance in the recognition of musical talent in the normal audition process, Uszler (1990) cautions that the process identifies talent "after the fact." The results may identify the overprepared student as the talented student, overlooking the potentially talented student who might be uncomfortable in a formal performance setting. Musical aptitude testing together with musical tasks that require self-initiative and creativity might help uncover these hidden potential talents.

Creative Thinking in Music

Musical performance inevitably involves some elements of creativity, given that the dynamic aesthetic of performance is created through creative

interpretation (Uszler, 1990). Specifically, creative interpretation communicates sounds that describe the expressive intent of the musician, and the performer is the creative interpreter of music. While creativity can be linked with performance, it is mostly linked with composition and improvisation in the creative process or product.

In general terms, the musical creative process involves realizing sounds internally and communicating ideas and emotions through sound, or creatively interpreting ideas to others. Langer (1953) describes the full creative musical experience from improviser and composer to performer to listener. Improvisers and composers generatively interpret their expressive ideas through sound. Performers and listeners continue the creative process begun by improvisers and composers through interpreting their expressive ideas guided by the musical score or recording. The creative process is complete when the completed composition is realized through the interpretation of a performer, communicated to a listener. Langer (1953) also believes that all listeners can enjoy the emotional connection with music without becoming occupied with the technical specifics of knowing musical structure or instrumental timbre. Along this line, Haroutounian (2002) believes that what is observed in a talented student's behavior when engaged in musical tasks is the element of creative thinking through sound. To recognize musical talent is to recognize this creative thinking in music, whether it is through composing, improvising, performing, or listening.

Identifying Musical Talent in the School Setting

Given the diversity of perspectives on what constitute musical talent and the early signs and indicators of musical talent, the process of recognizing or identifying musical talent could be very different. Based on approaches that emphasize examining the sensory capacities of listening, observing the expression or creative interpretation in musical performance, or judging the creative process in composing, improvising, performing and listening, it is no surprise that one might identify musical talent in different groups of

students. Thus, an integrative approach that takes into account the different perspectives might be desirable. For example, adapting Renzulli's (1986) three-ring model of giftedness to musical talent, a musically talented child is one who is above average in musical aptitude and ability, shows commitment and self-motivation, and demonstrates creativity or creative interpretation in musical work. In this connection, musical talent can be conceptualized as encompassing a configuration of music-specific capabilities, aptitude or skills, musical creativity, and personality-motivation factors (see Baum, Owen, & Oreck, 1996; Kay & Subotnik, 1994).

An identification procedure in the school setting might start with the use of an approach that includes nominations and observation ratings by teachers, parents, and peers for gathering data from multiple sources. Self-nomination and self-report can also be used to complete and establish a student's musical talent profile. In this regard, Haroutounian (2002) advised music educators not to use general aptitude or IQ tests, academic achievement tests, or general creativity tests for identifying musically talented students, contending that these tests are not suitable for musical talent identification and might even exclude potentially talented students.

With the development of an array of musical aptitude tests for students of all grade levels and ages, it seems appropriate to choose and utilize these tests as available objective measures in school musical talent identification. Musical aptitude testing provides valuable information about student potential talent that may be obscured by classroom behaviors or may not be noticeable in musical performance. The emphasis on aural discrimination skills of musical aptitude seems to be a good starting point. However, while these tests are useful tools to discover hidden potential listening talent, caution must be exercised that musical aptitude test scores should not be taken as the sole determinant of talent but should be used in conjunction with observation, performance assessment, and recommendations from a variety of sources. Further, musical aptitude testing should not be used as a basis for limiting instruction to those students who show strength in musical aptitude scores.

The real world of music-making requires discrimination of sounds within a context and structure, which goes beyond simple musical aptitude testing. Therefore, on top of the ability to discriminate pitch and rhythm and the inner sensing of sound, music-specific characteristics of tonal memory (ability to remember songs and melodies) and aesthetic sensitivity (awareness of mood or character of the music) should be added and assessed. In addition, the motivating factors of commitment and drive in musical work, which are important behavioral characteristics that directly affect musical talent development, should be taken into consideration in the assessment and identification process.

Specifically, testing may be followed by more individualized performance activities in an audition setting, which may be assessed by one or more specialists and music teachers who have expertise in recognizing potential as well as demonstrated talent. In judging musical performance, judges should be reminded of the inclusive nature of the identification process, which is quite different from the exclusive nature of performance assessment in competition settings. Judgments on specific musical performance in an audition setting could also be extended to assessment of students engaged in musical tasks through observation of the process of developing musical work. The ideas of fluency, flexibility, elaboration, originality, and syntax provide a guiding creative vocabulary to structure observation of musical talent through completing musical tasks. Students who truly connect with musical tasks and personally communicate through creative interpretation in improvising, composing, and performing are students who show the spark of musical talent (Haroutounian, 2002).

Music Education in Hong Kong Schools

In Hong Kong, it is generally recognized that music is fundamental to the intellectual, emotional, and creative growth of children and youths, and music education is part of a well rounded and balanced education (e.g., Education Commission, 2000; Wong, 2005). Positive effects of music education are

numerous and well documented. They include improvements in, among others, learning and spatial reasoning (e.g., Rauscher, Shaw, & Ky, 1995; Rauscher, Shaw, Levine, & Wright, 1997), verbal memory (e.g., Chan, Ho, & Cheung, 1998), and classroom attitudes and behaviors as well as school performance (e.g., Gardiner, Fox, Knowles, & Jeffrey, 1996). In recent years, with the increasing acceptance of the conceptualization of multiple intelligences (Gardner, 1983, 1999), music or musical intelligence is accepted not only as a teaching tool to enhance learning but also as a way of knowing. Yet, schools in Hong Kong might be somewhat inimical to music education and the development of musical talent.

Despite the understanding that a balanced music curriculum that includes components of listening, performance, and composition is desirable, music education in Hong Kong schools tends to be heavily biased toward listening activities that encompass singing and music reading, and any creative music-making and instrument playing activities are generally not included in music lessons (see Leung, 2004). There are obvious reasons for this bias, as there are numerous constraints that include classroom management problems, large class size, and the lack of school resources and support from school principals and other teachers (Ng & Morris, 1998). Hiebert (1993), in reviewing music education in Hong Kong schools, characterizes learning opportunities in music as a pyramid with a broad base of inadequate primary and junior secondary music curriculum, a pinnacle in university music courses and conservatory studies at the Hong Kong Academy of Performing Arts, and a missing mid-section of senior secondary music curriculum that is virtually crowded out of the school curriculum by other academic subjects competing for time because of pressing public examinations on these subjects. While parental commitment to providing music lessons for their children has created a substantial base for private tuition for instrument playing outside the school music curriculum, at the Music Office, and for Royal Schools of Music examinations, students with less parental support for private lessons might have few opportunities to sustain their serious musical interests to allow

the unfolding of their musical talent, or to consider careers in music and related fields (see Hiebert, 1993; Ng & Morris, 1998).

In view of the generally inadequate preparation confined mostly to music appreciation in the outdated 1983 primary and secondary music curriculum, the government has moved to revise and update the music curriculum in line with recent education and curriculum reforms (Curriculum Development Council, 2003). The revised *Music Curriculum Guide* articulates four learning targets aimed to develop creativity and imagination, to develop music skills and processes, to cultivate critical responses in music, and to understand music in context. To achieve these targets, integrated music activities with listening, performing, and creating are suggested. The new emphasis on allowing students to experience music by active student participation that involves creative interpretation through performance, improvisation, and composition might help pave the way for redressing the imbalance in emphasis in music education as well as providing new avenues for developing musical talent in Hong Kong schools.

Musical Talent Identification in Hong Kong Schools

Current interests in the development of multiple intelligences or diverse talents in students have also brought particular relevance and importance to the identification of musical talent in the Hong Kong school setting. Given that there is as yet no centralized government planning on music education and on developing musical talent in schools, there is currently no commonly accepted ways of recognizing or identifying musical talent in school children. Specifically, the need to identify musical talent might arise from the need to select students for schoolwide or inter-school music competitions. Invariably, the identification of musical talent falls into the hands of the school music teacher who recognizes a student's talent in his or her outstanding performance at singing or instrument playing. Therefore, it is not known whether there are students who might have potential talent that is not noticeable in performance. Similarly, it is not known whether there are

musically talented students who are brought up in families unable to support them in their pursuit of musical interests, and their musical potentials have hence never been recognized or developed. To ensure that musical talent will not remain unrecognized, planning on a systematic identification procedure warrants careful consideration.

A systematic identification procedure in Hong Kong schools might employ a sequential assessment approach that starts with nominations and behavioral observation ratings by teachers and parents, followed by musical aptitude testing, performance in an audition setting, and performance on other musical tasks. For behavioral observation ratings, the Chinese versions of the *Scales for Rating the Behavioral Characteristics of Superior Students* (SRBCSS; Renzulli, Smith, White, Callahan, & Hartman, 1976) have been in use in Hong Kong for some time. This instrument includes ten rating scales designed to obtain teacher ratings on student behaviors in various areas, including art, music, drama, and communication. The *Musical Characteristic Rating Scale* from the SRBCSS includes seven items assessing student interest in musical activities, music-specific characteristics in perceptual discrimination, in tonal memory and sense of pitch, and in sense of rhythm. The Chinese versions in use have separate parent and teacher versions. But unfortunately, the music scale has not been translated or included for use, and translation work needs to be done to cover the music area.

My work with the *Student Multiple Intelligences Profile* (SMIP; Chan, 2001), a self-report assessment scale on multiple intelligences (including musical intelligence) has also contributed an alternative rating scale that can be readily modified or adapted for use by teachers and parents. The small number of items tapping musical intelligence might render the musical scale less reliable, and further work needs to be done to expand the number of items to cover more comprehensively behaviors suggestive of musical talent.

Based on nominations and behavioral ratings, which should be inclusive rather than exclusive, musical aptitude testing should be the next logical

step. While musical aptitude tests generally focus on aural discrimination, it is desirable to include assessment on students' sensitivity to the expressive and emotional aspects of music. In this regard, Gordon's (1995) comprehensive *MAP* appears to be the test of choice. The obvious drawback is the length of the test, which requires three 50-minute to complete. At present, I am working on testing whether students' narrative descriptions and drawings on listening to a selected piece of music could be used as responses suggestive of students' sensitivity to the expressive and emotional aspects of music, which in turn might be indicative of musical talent. Whether this conjecture receives empirical support needs to be carefully scrutinized and evaluated. Nonetheless, creative interpretation through performance, improvisation, and composition should always be made part of the assessment or identification procedure, and there is no substitute for observation and judgment on students' engaging in musical tasks by specialists and experts in the field.

In summary, it is believed that musical talent identification in Hong Kong schools should be built solidly on a balanced music curriculum, and informed by the comprehensive knowledge base of musical aptitude testing and talent identification procedures. Hong Kong educators need to rise to this challenge in order to prevent the continuing squandering of talent resources when the musical talent of children and youths in our schools remains unrecognized and undeveloped.

References

- Bamberger, J. (1986). Cognitive issues in the development of musically gifted children. In R. J. Sternberg & J. Davidson (Eds.), *Conceptions of giftedness* (pp. 389–413). Cambridge, U.K.: Cambridge University Press.
- Baum, S., Owen, S. V., & Oreck, B. A. (1996). Talent beyond words: Identification of potential talent in dance and music in elementary students. *Gifted Child Quarterly*, 40, 93–101.
- Bloom, B. S. (Ed.). (1985). *Developing talent in young people*. New York: Ballantine.

- Boyle, J. D., & Radocy, R. E. (1987). *Measurement and evaluation of musical experiences*. New York: Schirmer Books.
- Chan, A. S., Ho, Y., & Cheung, M. (1998). Music training improves verbal memory. *Nature*, *396*, 128.
- Chan, D. W. (2001). Assessing giftedness in Chinese secondary school students in Hong Kong: A multiple intelligences perspective. *High Ability Studies*, *12*, 215–234.
- Curriculum Development Council. (2003). *Arts education key learning area — Music curriculum guide (primary 1 – secondary 3)*. Hong Kong: Government Printer.
- Davis, J. (1978). *The psychology of music*. London: Hutchinson.
- Education Commission (2000). *Learning for life, learning through life— Reform proposals for the education system in Hong Kong*. Hong Kong: Author.
- Ericsson, K. A., Krampe, R. T., & Tesch-Romer, C. (1993). The role of deliberate practice in the acquisition of expert performance. *Psychological Review*, *100*, 363–406.
- Feldman, D. H. (1993). Child prodigies: A distinctive form of giftedness. *Gifted Child Quarterly*, *37*, 188–193.
- Fisher, R. (1973). *Musical prodigies: Masters at an early age*. New York: Association Press.
- Gardiner, M. F., Fox, A., Knowles, F., & Jeffrey, D. (1996). Learning improved by arts training. *Nature*, *381*, 284.
- Gardner, H. (1983). *Frames of mind*. New York: Basic Books.
- Gardner, H. (1999). *Intelligence reframed*. New York: Basic Books.
- Gordon, E. E. (1986). *The nature, description, measurement, and evaluation of music aptitudes*. Chicago: GIA.
- Gordon, E. E. (1995). *Musical aptitude profile*. Chicago: GIA.
- Haroutounian, J. (2002). *Kindling the spark: Recognizing and developing musical talent*. New York: Oxford University Press.
- Hiebert, A. (1993). Music education/learning opportunities in Hong Kong. *Education Journal*, *21*(1), 77–85.
- Howe, M. J. A. (1990). *The origins of exceptional abilities*. Oxford, U.K.: Blackwell.
- Howe, M. J. A., Davidson, J. W., Moore, D., & Sloboda, J. A. (1994). Are there early childhood signs of musical ability? *Psychology of Music*, *23*, 162–176.

- Howe, M. J. A., Davidson, J. W., & Sloboda, J. A. (1998). Innate talents: Reality or myth? *Behavioral and Brain Science*, *21*, 430–431.
- Judd, T. (1988). The varieties of musical talent. In L. Obler & D. Fein (Eds.), *The exceptional brain: Neuropsychology of talent and special abilities* (pp. 127–155). New York: Guilford Press.
- Kay, S. I., & Subotnik, R. F. (1994). Talent beyond words: Unveiling spatial, expressive, kinesthetic, and musical talent in young children. *Gifted Child Quarterly*, *38*, 70–74.
- Kemp, A. E. (1996). *The musical temperament: Psychology and personality of musicians*. Oxford, U.K.: Oxford University Press.
- Kirnarskaya, D., & Winner, E. (1997). Musical ability in a new key: Exploring the expressive ear for music. *Psychomusicology*, *16*, 2–16.
- Langer, S. (1953). *Feeling and form*. New York: Scribner's.
- Leung, B. W. (2004). A framework for undertaking creative music-making activities in Hong Kong secondary schools. *Research Studies in Music Education*, *23*, 59–75.
- Miller, L. K. (1989). *Musical savants: Exceptional skill in the mentally retarded*. Hillsdale, NJ: Erlbaum.
- Miller, L. K. (1999). The savant syndrome: Intellectual impairment and exceptional skill. *Psychological Bulletin*, *125*, 31–46.
- Mursell, J. L. (1964). *The psychology of music*. Westport, CT: Greenwood Press.
- Ng, F. Y., & Morris, P. (1998). The musical curriculum in Hong Kong secondary schools—Intentions and constraints. *International Journal of Music Education*, *31*, 37–58.
- Persson, R. S. (2000). Survival of the fittest or the most talented? Deconstructing the myth of the musical maestro. *Journal of Secondary Gifted Education*, *12*, 25–38.
- Persson, R. S., Pratt, G., & Robson, C. (1996). Motivational and influential components of musical performance: A qualitative analysis. In A. J. Cropley & D. Dehn (Eds.), *Fostering the growth of high ability: European perspective* (pp. 287–301). Norwood, NJ: Ablex.
- Radford, J. (1990). *Child prodigies and exceptional early achievers*. New York: The Free Press.
- Rauscher, F. H., Shaw, G., & Ky, K. (1995). Music and spatial task performance. *Nature*, *365*, 611.

- Rauscher, F. H., Shaw, G., Levine, L., & Wright, E. (1997). Music training causes long-term enhancement of preschool children's spatial-temporal reasoning. *Neurological Research, 19*, 2–8.
- Renzulli, J. (1986). The three-ring conception of giftedness: A developmental model for creative productivity. In R. J. Sternberg & J. E. Davidson (Eds.), *Conceptions of giftedness* (pp. 53–92). New York: Cambridge University Press.
- Renzulli, J. S., Smith, L., White, A., Callahan, C., & Hartman, R. (1976). *Scales for rating the behavioral characteristics of superior students*. Mansfield Center, CT: Creative Learning Press.
- Scott, D., & Moffett, A. (1977). The development of early musical talent in famous composers: A biographical review. In M. Critchley & R. Henson (Eds.), *Music and the brain: Studies in the neurology of music* (pp. 174–201). London: William Heinemann Medical Books.
- Seashore, C. E. (1938). *Psychology of music*. New York: McGraw-Hill.
- Shuter-Dyson, R. (1986). Musical giftedness. In J. Freeman (Ed.), *The psychology of gifted children* (pp. 159–183). Chichester, U.K.: Wiley.
- Sloboda, J. (1985). *The musical mind: The cognitive psychology of music*. Oxford, U.K.: Oxford University Press.
- Sloboda, J. (1994). Music performance: Expression and the development of excellence. In R. Aiello & J. Sloboda (Eds.), *Musical perceptions* (pp. 153–169). New York: Oxford University Press.
- Sloboda, J. (1996). The acquisition of musical performance expertise: Deconstructing the “talent” account of individual differences in musical expressivity. In K. A. Ericsson (Ed.), *The road to excellence: The acquisition of expert performance in the arts and sciences, sports, and games* (pp. 107–127). Mahwah, NJ: Erlbaum.
- Sloboda, J., & Howe, M. (1991). Biographical precursors of musical excellence: An interview study. *Psychology of Music, 19*, 3–21.
- Sosniak, L. A. (1985). Learning to be a concert pianist. In B. S. Bloom (Ed.), *Developing talent in young people* (pp. 19–67). New York: Ballantine Books.
- Sosniak, L. A. (1985). One concert pianist. In B. S. Bloom (Ed.), *Developing talent in young people* (pp. 68–89). New York: Ballantine Books.
- Teplov, B. M. (1966). *Psychologie des aptitudes musicales*. Paris: Presses Universitaires de France.
- Uzler, M. (1990). Musical giftedness. *American Music Teacher, 41*(4), 20–21, 69–73.

- Winner, E. (1996). *Gifted children: Myths and realities*. New York: Basic Books.
- Winner, E., & Martino, G. (2000). Giftedness in non-academic domains: The case of the visual arts and music. In K. A. Heller, F. J. Monks, R. J. Sternberg, & R. F. Subotnik (Eds.), *International handbook of giftedness and talent* (2nd ed., pp. 95–110). New York: Elsevier.
- Wong, R. Y. (2005). Music in education is education for life. *International Journal of Music Education*, 23, 107–109.