

# MUSICIANS IN THE MAKING

Edited by  
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MUSICIANS IN  
THE MAKING

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# **Musicians in the Making**

PATHWAYS TO CREATIVE PERFORMANCE

Edited by

John Rink

Helena Gaunt

Aaron Williamon

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PART 1

## **Creative learning in context**

## **Learning to perform**

FROM 'GIFTS' AND 'TALENTS' TO SKILLS  
AND CREATIVE ENGAGEMENT

Jane W. Davidson and Gary E. McPherson

This chapter focuses on the catalysts evident in learners who pass from a casual or partial interaction with music, through to the highly committed and intensely focused engagement stereotypically associated with the highly successful young classical musician. These catalysts include material provisions, milieu and key individuals; also intrapersonal factors such as traits, personal awareness, motivation and volition. In order to contextualize the discussion, an initial exploration of terms such as 'gifts' and 'talents' highlights the way in which blanket concepts have tended to be overemphasized to account for the acquisition of musical abilities, especially those that are achieved quickly and that lead to high-level accomplishment. This analysis reveals that many of the ideas generally held about musical ability have, in part, been entwined in our western social and cultural operational and belief systems, with 'gifts' and 'talents' being at best vague and often poorly defined concepts adopted to overcome shortcomings in theoretical and reflective insights. With these social and cultural preconceptions highlighted, case-study examples are used to outline some of the complex and detailed ways in which learners progress to high-level competency by acquiring and refining performance skills.

### **Defining giftedness and talent**

In western societies, music is often characterized by a stark contrast between a very small cohort of exceptionally able young musicians and the

masses of youngsters who either dabble in or typically fail to learn music to any degree of competency. When critically examined, the logic behind this bipartite characterization proves to be culturally determined and intellectually flimsy. First, and significantly, in these contexts exposure to learning opportunities and engagement with music performance are known to be piecemeal and variably supported within social groups, so that where high achievement is observed, it is reported as being exceptional. Second, those who do achieve very high standards in early childhood (often referred to as musical prodigies) are always well introduced to and nurtured through their music learning (Davidson and Faulkner 2013). Thus, there are environmental catalysts contributing to the learning processes that are highly influential on progression.

Historically, the discourse on giftedness and talent shows three distinct trends: a theological perspective, in which children who displayed special abilities were regarded as 'heavenly' or a gift from God; a metaphysical phase that emphasized individual aptitudes but which also fostered many myths such as the stereotyped 'crazed genius' portrayed in films even today; and finally a contemporary empirical approach that attempts to focus on domain-specific training, the interaction of genetic and environmental factors, educational measures and individual differences, and how these differ between cultures (Stoeger 2009).

However, even in the current empirical phase of enquiry, the terms 'gifted' and 'talented' are often used interchangeably or inconsistently. This is found not only in research studies but even more vividly in descriptions from education agencies such as Ofsted (2009) in the UK, where the term 'gifted' is used to describe learners with high ability or potential in the academic subjects, and 'talented' for those with high ability or potential in the expressive or creative arts or sports. 'Giftedness' is used by other educational authorities to indicate excellence of a higher order than talent (e.g. Ross et al. 1993). Because these usages of the terms do not adequately explain the difference between human potential and actual achievement, they lead to confusion and a number of misunderstandings within the public and even by researchers. Another problem is that conceptions of the two terms are inevitably culture-specific. Shin'ichi Suzuki's (1898–1998) Talent Education method for training young violinists and pianists, for instance, is based on the principle that all children can develop requisite musical skills provided they are exposed to the 'right' education (Suzuki 1983), thereby representing a way of thinking that is solidly based on Japanese societal values, in which hard work is often respected above achievement.

Our preference is to differentiate between the terms 'giftedness' and 'talent' according to how they are most commonly used in educational systems around the world. In line with Gagné's (2013) view, we prefer to distinguish between

domains of ability (*gifts*) and fields of performance (*talent*). 'Giftedness' therefore can be used to describe individuals who are endowed with natural *potential to achieve* that is distinctly above average for their age group in one or more aptitude domains. These aptitudes are natural abilities that have a genetic origin and that appear and develop more or less spontaneously in every individual. The mix of these aptitudes explains the major proportion of differences between individuals when the surrounding environment and practice are roughly comparable. It is important to note, however, that aptitudes do not develop through maturation alone: environmental stimulation through practice and learning is obviously essential. In contrast, 'talent' can be used to describe someone who demonstrates *superior performance* (or *superior skills*) as a result of some type of systematic training in a specific field. With reference to music, this can include a range of competencies that encompass defined talents such as performing, improvising, composing, arranging, analysis, appraising, conducting and teaching (Gagné 2013).

Gifts and talents have been clearly defined and modelled in the work of Gagné (2013) and elaborated in respect of music by McPherson and Williamon (2016). This work presents a differentiated model of the various forms of gifts and musical talents, which offer explanations of underpinning catalysts that shape talent. Figure 1.1 shows the model and outlines the physical and mental resources utilized in music-making (referred to as 'natural abilities') and the various forms of musical competencies necessary for this activity. The model also offers an account of the developmental processes and the environmental and intrapersonal catalysts required for musical learning. It seems, then, that according to this approach, all elements need to be stimulated if musical skill is to be attained. This stimulation will happen in a differentiated manner, sometimes occurring as the product of chance; the abilities and competencies of some individuals will place them in the top 10 per cent of a cohort where they can be specifically labelled (for those who choose to do this) 'gifted' or 'talented'.

The plethora of factors interacting to produce different abilities and competencies seems logical enough, but it leaves 'giftedness' and 'talent' as rather crucial constructs without detailed explanation of causation. Gagné's concept of chance might be more successfully accounted for in recent work by Davidson and Faulkner (2013) on *syzygies*, which is explored in this chapter as a different theoretical explanation of the factors that move individuals from basic skills acquisition and competency through to very high-level achievement. With Davidson and Faulkner's explanation, we are able to develop the argument that pathways to such achievement comprise resourceful and inventive alignments for productive learning outcomes; in other words, there are creative and typically highly motivating routes to achievement.

### Social and family perceptions of musical potential and ability

A key point in the discussion so far is that the acquisition of musical talent, particularly in western learning contexts, results from a great deal of hard work by successful musicians who have practised for significant amounts of time using broadly similar, systematic strategies that encourage learning. Growing research in neurology shows that all humans have the capacity to perceive and generate musical information, with a hard-wired impulse for music-like interaction apparent in infancy (see Hodges 2016; Malloch and Trevarthen 2009). Also, evidence abounds in many other social contexts that high achievement in music is the norm. Making a cultural shift from the western classical music context, there are myriad cultures in which children are encouraged from birth to engage with music. Often, if the cultural conditions permit, expectations can be created that result in high levels of achievement being acquired. The Venda of Limpopo Province in South Africa present a useful example of a cultural group for whom daily life involves creative musical experience and practice, and with musical performance skills being represented in all members of society at a high level of competency (Emberly and Davidson 2011). In this specific context, some people are regarded as possessing more or less individual skill, and this perception is recognized as being based as much on their investment and specialization as it is on any natural 'gifts' which might have shaped their potential to achieve. For example, from a very young age, children can be seen imitating adults and experimenting with music and dance outside the typical adult 'circle' of activity, and it is when these efforts have generated enough focus and basic familiarity with the artistic form that children are then moved inside the 'circle'. While all will learn and perform as a matter of course, some will experiment more and for longer, creating their own variants on songs and dances; thus their creative effort distinguishes them from their colleagues.

Other examples of the complexity of this issue pervading western social contexts include cases where public conceptions of 'gifted' and 'talented' result in self-fulfilling prophecies of both success and failure. For instance, Borthwick and Davidson (2002) investigated a family within which there were very strong 'scripts' about resemblances in physical appearance, temperament and abilities between children, parents and grandparents. These 'family scripts' have been shown to have powerful influences over the ways in which families treat one another and also how individuals within those families progress (Byng-Hall 1996). In the case study presented by Borthwick and Davidson, one child was strongly identified as the musician and given a script that linked him at many levels to his professional musician father—same physique, temperament, facility to make music and intellectual connection to music—while another child said to resemble the maternal grandmother was given her 'visual artist' identity. In this case, the script worked negatively against the second child in his efforts to learn a musical instrument, for 'it just was not in his make-up'. In other

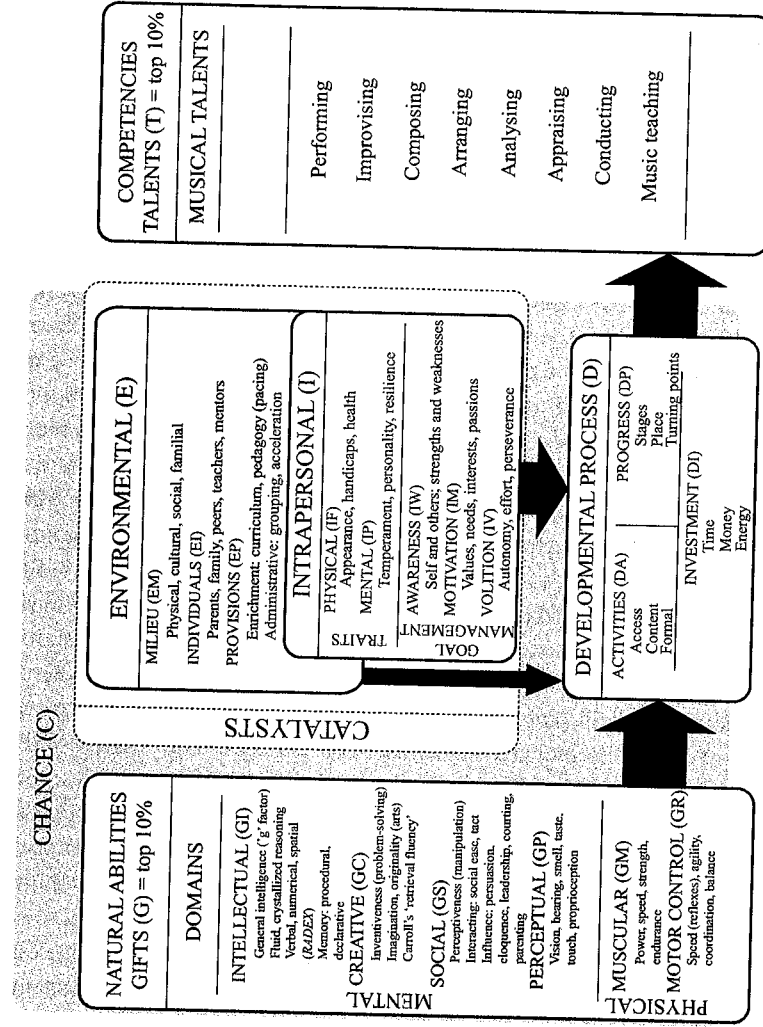


FIGURE 1.1 Differentiated model of musical giftedness and talent (adapted from Gagné 2009: 64; see also McPherson and Williamon 2016)

words, he was perceived by his parents as possessing no natural gift for music and certainly no musical talent.

To take further the discussion above, we need to understand how musical competency is attained, focusing on the evidence that embraces mental and physical abilities, environmental and personal catalysts, and developmental processes that stimulate the acquisition of musical skills. Such a detailed and argued case must account, of course, for what stimulus pushes the individual beyond the threshold of competency towards eventual high-level attainment—that special 10 per cent to which Gagné (2013) alludes.

### Musical competencies and their emergence

During the early 1990s, the current authors conducted separate research projects that focused specifically on the biographical factors contributing to the emergence of musical skills. Davidson and her colleagues worked in the UK with young learners of different backgrounds, ranging from those with minimum and unsuccessful learning experiences to those who were considered to display prodigious abilities (see Davidson, Howe and Sloboda 1997 for a summary). The study revealed that children who became highly successful musicians had extremely similar biographical profiles that were very different from those whose engagement with music either was casual or ended in a failure to learn. The biographical 'musical success' factors included reports of early spontaneous singing activity occurring six months before the rest of the children studied; four times the amount of practice accumulated compared with other groups of children in the study; rapid progress through examinations (music grades); highly distinctive and stimulating family dynamics, with sibling support in the form of either role models or forms of rivalry that were positively framed by the learner; distinctive and very high levels of parental/caregiver involvement in lessons and practice; and inspirational role models, especially teachers.

Several interpretations of these conclusions require discussion. First, the finding that parents reported their musical children as singing a good six months earlier than their counterparts could be explained in a number of ways. One account is that these infants were truly self-engaging in their early music-related creative activities and did sing sooner than their peers and siblings. Alternatively, the parents consciously engaged with these specific children earlier through music than they did with other children. Another possibility is that since the interviews undertaken were inevitably retrospective, the parents—in the light of their children's current musical successes—reconstructed their memories of early musical engagement, recalling these high-achieving musician children as being more precocious in singing than their siblings. This last explanation, though possible, was controlled for when collecting data by asking

parents to match perceptual qualitative judgements against factual events and to look for as much hard evidence as possible.

Second, these children amassed four times the amount of formal practice (scales, technical exercises, etc.) compared with peers who either sustained a passing interest in music or had given up playing after a minimum of one year of formal study. This specific finding has stood up in the literature over a number of decades, with the quantities of practice discovered as being consistent with some of the data collected in other studies of professional musicians (see Ericsson, Krampe and Tesch-Römer 1993). The figures include a daily average of thirty minutes in the first year of learning, with an exponential growth so that by the age of twenty-one years, these competent musicians have achieved more than 10,000 hours of accumulated practice. This quantitative 'fact' has been somewhat over-represented in the literature, with the popular press translating it into 'practice makes perfect'; nevertheless, this was a robust finding, suggesting that this high quantity of practice had a positive impact on development of skill for high achievement. Indeed, when examination achievements were correlated with quantities of practice, a startling result was revealed: all the cohorts studied (high-achieving musicians as well as those who had given up) progressed through their examination grades at a rate that was proportional to the amount of practice they had done. For instance, a child in the high-achieving musician group might have attained Grade 1 in one year if the average practice was thirty minutes a day. A child in the 'given up playing' cohort might also have achieved Grade 1 but after six years of playing, yet the total number of minutes of accumulated practice would be identical to that of the participant in the high-achieving group.

The parents/caregivers of the high-achieving group were also much more engaged in practice and lesson activities. These parents typically kept practice diaries with their children and attended lessons, taking notes and then assisting the child with his or her practice. None of the other participants had anything like this level of engagement or involvement. But note that the musical backgrounds of this cohort of children were no more extensive than those of the other children studied: rather, these parents seemed to invest more time and effort in their child's music-making. Often, the parents would become involved in activities such as the school band committee or assist on music trips and so on.

The overarching family dynamics were consistent within this high-achieving group and very different from those relevant to the other participants. Even where a sibling was teased or bullied by another sibling, such feedback was employed by the successful music learner to advantage. Negative comments or threats were used as a positive reinforcement towards practice, providing a motivation to prove the sibling wrong. There were also families where all siblings were learning music, and this generated a supportive dynamic. Indeed, in

one successful family studied, the children had been given instruments so that classical piano trio and string quartet repertoire could be played between them.

Support was also garnered from other people such as teachers, who were seen as major inspirations for what could be achieved. The most successful students had on average 2.5 teachers over the period between eight and eighteen years of age, whereas those who ceased playing often had a rapid succession of teachers. Those who persisted with their music learning typically reported their first teacher as being warm and supportive, seeing their parental qualities of care and nurturance to be much more important and relevant than musical expertise. As the child's skill and interest persisted, however, personal qualities were superseded by a need for musical expertise and for the teacher to stretch the student. In addition to teachers, famous musicians also presented role models, their masterclasses and summer schools having a huge influence on the learner's motivation to continue.

Overall, the work by Davidson et al. highlighted the importance of the establishment of specific quantities of practice, and the role of other people and environmental catalysts to stimulate and sustain engagement. These findings account to some degree for the role of physical and mental skills in the development of control of the musical work; for the role of milieu, individuals and provisions; and for the activities and investments required to achieve the skills. But the picture remains incomplete, for the research did not deal with the considerable variation in individual attainment, which was generally attributed to categories such as 'chance', 'gift' or 'talent' as described in Figure 1.1. The work also concentrated on student responses rather than educational inputs, and it did not engage in any depth with the opportunities afforded by the environments in which the children developed.

McPherson's work in Australia focused on how children developed musical skill efficacy, and this helped to demystify the study of the educational content required for musical competencies to develop. McPherson noted that all children receiving instruction developed better music skills when their lessons included a balance between visual, aural and creative forms of performance, and that this served as a foundation for successful learners who were more ready to understand notation, cope with memorizing music, play by ear or improvise (McPherson 1995a, 1995b). From his analysis, McPherson was able to model young instrumentalists' ability to perform music creatively (improvise), aurally (play from memory and by ear) and visually (perform rehearsed music, sight-read). Using path analysis, he demonstrated that the ability to improvise was strongly related to the skill of playing by ear, and sight-reading related to the ability to perform rehearsed music. In other words, it was being allowed to trial and develop skills that encouraged inventiveness, thus stirring the musical imagination and in turn contributing to the development of skills relevant to the performance of notated music. As shown in the simplified version of the path relationships depicted in Figure 1.2, the ability to play by ear was

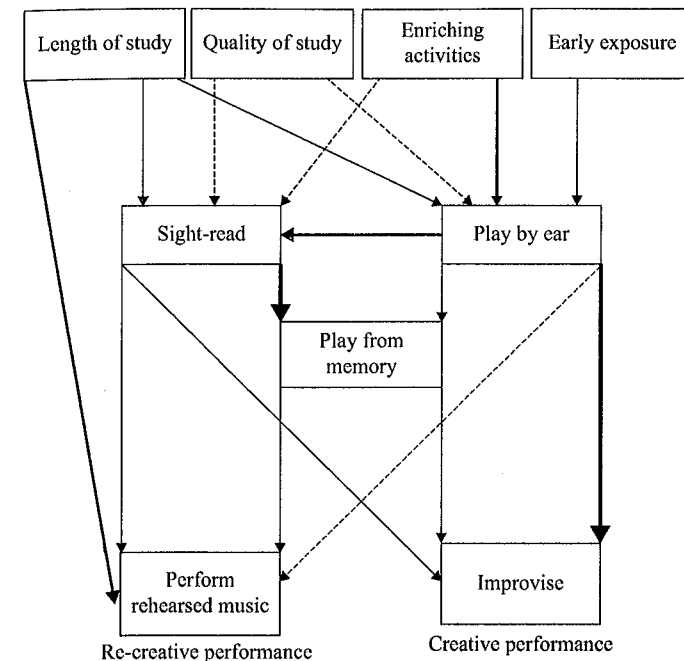


FIGURE 1.2 McPherson's (1993) model of relationships between musical skills and conditions of study (with simplified arrows to demonstrate the strength of paths between the variables)

strongly related to sight-reading, while both playing by ear and sight-reading were related to the student's ability to play from memory.

This interrelationship of skills was a new finding that challenged many commonly held beliefs, even though it provided empirical evidence for what many music educators had been advocating. For example, for years teachers had maintained that playing by ear was a distinct skill unrelated to sight-reading, but the investigations revealed that those learners who played by ear and improvised were also among the best sight-readers. The reverse was also often the case. In fact, having a strong aural representational map provided an obvious foundation on which to translate this skill to the symbolic written and reading forms of music. This principle is certainly common practice in learning to write language: we develop high-level skills in speech before we develop skills in reading and writing. Allied to this, and perhaps not surprisingly, those who had been exposed to musical experience primarily through visually oriented (notation-based) learning were typically weak at the aural elements of music.

Figure 1.2 also shows the precursor input underpinning the ability to use auditory and visual representations. McPherson found that early exposure to music had a relationship with creative experience and that it assisted with enriching activities such as musical games and exercises. Also, the quality of the study was found to be a prerequisite to both sight-reading and playing

by ear, with specific kinds of detailed work within the practice assisting in these musical capacities. Like Davidson and her colleagues, McPherson also found that the length of study had a direct impact on the capacity to perform rehearsed music and an indirect effect on the other four skills, thus demonstrating that enhanced performance resulted from a balance between the development of creative, aural and visual skills. McPherson's work revealed a series of interlocking subskills necessary for the development of musical knowledge and that these were most likely to impact positively on the acquisition of various music performance skills if learned in a specific order.

In addition to the technical aspects of music-making such as the capacity to sight-read or play by ear, musical performance expression—long regarded as a matter of individual artistry and as the defining 'natural gift' at the heart of the overarching 'talent' myth—is also a systematic skill. To play with expression, musicians require clear knowledge based on the rules of expressivity (which relates to specific musical structures). These rules need to be systematically applied by the student in order to communicate structural features. And while the rules are stable and can be systematically reproduced over time, some flexibility is required in the case of expertise whereby experts are able to hold back or exaggerate the expressive profile of a work to highlight different features. Indeed, data from informal learners rather than formally taught musicians revealed that several biographical and environmental conditions led to expressive skill development. For instance, Sloboda and Davidson (1996) saw in the biographies of a range of musicians the virtually limitless opportunities afforded to these individuals for trial and error and for positive reinforcement, used in order to develop their musico-emotional links. Their own studies of children coupled with detail from the biographies of high-achieving musicians revealed that had these individuals not strongly engaged with these musico-emotional aspects of playing, their efforts to practise might well have diminished. Those who succeeded in their musical learning found it engaging, motivating and personally rewarding. They commented that basic practice was often tedious and boring, but that 'messing around' and 'having fun with the rules of music' through imaginative play gave them access to very positive experiences.

Further to experiencing music's emotional affect as a positive motivation for learning, those students in the study by Davidson et al. who gave up music often found the routine and the hard work of practice overwhelming, especially as for them it offered no personal rewards. It seems that they had not developed a connection to the emotional features of musical structures and had not learned how to manipulate these to self-rewarding ends. Indeed, these students did not engage in the sort of playful music-making where trial and error were permissible and motivating to learning. Over the last fifteen years, music educators have begun to realize the value in these sorts of informal learning spaces for musical development (see Green 2002, 2008;

Folkestad 2006; Chapter 6 in this volume). Referring again to the example from Venda culture, being immersed in an appropriate nonthreatening and cultural milieu seems crucial to giving value to the musical activity of the participants.

Thus far, we have established that there are some appropriate and necessary pathways required for musical competencies to flourish. But the studies outlined above do not in themselves pinpoint what specifically enables learners to cross the threshold from casual engagement to deep involvement, or conversely from initial casual engagement to a disinterest in continuing to study music. In the sections that follow, we pursue this idea of the threshold for immersion, engagement and progression, drawing on data from our more recent work and on theoretical insights developed from emergent research on academic homework and on school and study activities.

### Attaining the threshold for musical engagement

Detailed insight into the threshold necessary to engage in and develop musical competencies was achieved by undertaking a fourteen-year study of students from their very first school experience of learning a musical instrument through to achievement as young adults (McPherson, Davidson and Faulkner 2012). Of the 157 participants interviewed as seven-year-olds, 88 per cent were still learning at the age of twelve and 82 per cent at the age of thirteen, with a dramatic reduction to 37 per cent by the age of sixteen and 23 per cent by the age of eighteen (see Evans 2009). Of the 23 per cent still playing, only one went on to study music at tertiary level, whereas another who studied graphic design also worked on developing musical performance, eventually winning a highly esteemed national classical music solo competition and achieving a casual contract in the brass section of a symphony orchestra. The remaining seventeen players were actively engaged in performance, ranging from casual playing of a keyboard for personal reasons through community bands and choirs to university orchestras. Inevitably, the authors lost contact with a proportion of the participants over the years, and although this left a gap in the data it is interesting that after eleven years of study, contact was retained with 66 per cent of the original sample, which is a good statistic for longitudinal work. Of those who had given up playing, all were highly engaged music listeners, making up live music audiences and being active music consumers; their general regrets about giving up tended to focus on not having sufficient motivation to prioritize music in their lives, even those who had persisted to significant levels of competence.

Self-determination theory was a powerful framework drawn upon by the researchers in analysing the motivation of this cohort to persist and engage with music (see McPherson et al. 2012 for an overview; see also Evans 2009). By applying this theory, which focuses on the fulfilment of psychological needs

and thus accounts for motivation to continue learning (see Deci and Ryan 2002), the researchers found that of those who played musical instruments and performed during their high school years and beyond, some were involved in as many as fourteen categories of musical engagement, clearly demonstrating that music occupied the bulk of the time spent by these learners in school and out-of-school activities, and that it provided significant opportunity for artistic expression. Importantly, all of these activities were closely associated with strong peer ties. These activities also ranked highly in terms of personal enjoyment, which relates strongly to the musico-emotional link proposed by Sloboda and Davidson. In fact, it became apparent that for those who were progressing well in their learning, the musical activity was used as a self-regulating mechanism as well as for external connection.

Along with self-enjoyment and social focus, there was an emergent picture of increasing independence as learners persisted and progressed in terms of works selected to play and approaches to practice. The students engaged in learning also received tuition from teachers who might be described as less authoritarian and more facilitative, thus encouraging students to be more creative and increasingly independent and reflective in their learning. Overall, these emergent data offered a more finely grained view of how learning was being motivated and developed than in previous work (see Evans, McPherson and Davidson 2013). The close relationship to positive opportunity, self-concept and strong connection to others fitted well with Deci and Ryan's (2002) notion of self-determination as a crucial element in learning. According to this theory, in order for learning to be motivating and sustaining, three main psychological needs must be met: *competence*, i.e. a need to be effective in one's efforts; *relatedness*, i.e. a need to be integrated into a social group; and *autonomy*, i.e. a need to feel that activities are self-governed and of one's own free will. The logic of this approach for music learning is evident: if the learner feels in personal control of the learning environment, then engagement, enjoyment, progress and satisfaction are likely outcomes.

Data from the fourteen-year study confirmed that the fulfilment of psychological needs was critical, for when it did not occur, the students were most likely to give up their music learning, even when they had as much as eight to ten years of successful experience behind them. For example, students felt least competent, 'related' and autonomous at the point at which they quit their instrumental playing. This is supported by qualitative material collected from the participants, including the following statement: 'I quit the trombone in year 8 because the music we were playing was not challenging and crap, along with the fact that I wasn't noticed for my skill, didn't have many friends doing it, and the instrument wasn't used in the music I listened to at my leisure' (McPherson et al. 2012: 88). This single example reveals that music-making was considered by the participant not only to be socially irrelevant but to have impeded his social life; furthermore, his ability was not valued. In the light of this negative

experience, it is no wonder this participant ceased playing. The statement also indicates how powerful and affecting these memories of the learning context were at the point of giving up.

Self-determination theory has strong resonances with the tripartite model of experience and beliefs for ongoing learning and success proposed by Burland and Davidson (2004), whose work revisited the original cohort studied by Davidson et al. Burland and Davidson undertook detailed qualitative interviews with students who had crossed the threshold from serious school-student involvement in music into tertiary education and beyond, with their careers as young adults being developed as elite musicians. An emergent thematic analysis of transcript data revealed material identical in concept to relatedness (referred to as 'positive experience with others'; Burland and Davidson 2004: 241) and autonomy (Burland and Davidson's description was 'music as a determinant of self-concept'; *ibid.*: 241). Although the concept of competence was not paralleled in Burland and Davidson's data, there might be a common core. The third part of their interlocking model (see Figure 1.3) is 'methods of coping'. This refers to the fact that all of those who turned the corner in terms of developing an increasingly positive motivation and then succeeded in their performance were also able to cope with many of the challenges raised by such a lifestyle. In some respects, having a sense of competency might have enabled them to cope.

For instance, one participant interviewed by Burland and Davidson explained that although he was a competent pianist in his mid-teens who was making some progress, he realized that in order to be more competitive and find a personally positive and empowering niche, it would be better to change to the harpsichord. Having made that strategic decision, he then began to cope with the specifics of the harpsichord as well as issues surrounding baroque performance practices, and he began to conduct from the keyboard. He explained: 'I was [then] on my own as a harpsichordist, so I got to do everything, I got to play things, I got to organise groups. . . So, I made some huge mistakes, but I had

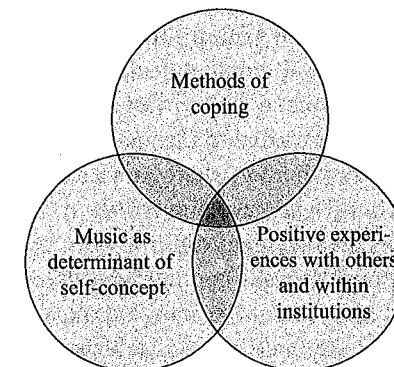


FIGURE 1.3 The Tripartite Model of Success (adapted from Burland and Davidson 2004: 241)

some great successes' (2004: 237). The theories in general and the specific data here indicate that high-achieving musicians typically result from nurturance that satisfies their psychological needs by building self-confidence, autonomy and relatedness. Such motivation supports and encourages the development of psychological resources that enable a musician to invest in the long hours of practice required to attain technical skill and that provide a foundation for the musico-emotional resources required to engage with musical expression.

Further to these ideas, Davidson and Faulkner (2013) have adopted the concept of 'syzygies'—a construct from astronomy—to develop a model of how the components of abilities (including physical characteristics, personality traits, general intelligence and domain-specific abilities), catalysts, developmental phases and competencies align. As shown above, Gagné (2009) has used the concept of chance as a means of accounting for differences in experience and outcome. Syzygies is a more complex concept, exploring and accounting for permutations of personal, social, cultural and other environmental factors that lead to the emergence of achievements. Davidson and Faulkner's theory postulates how multiple features become interrelated products of the worlds we inhabit. They propose that these products create gravitational systems that pull individuals towards motivated and positive achievement, not just in a particular discipline on the whole but in a particular area within that discipline. Referring to the biographies of significant musical achievers, they demonstrate how key life events align to help these artists first acquire skills in childhood and then attain exceptional levels of achievement across the lifespan. Like self-determination theory, syzygies acknowledge the key role of autonomy as well as relatedness.

Let us pursue the case for syzygies more fully by drawing on the examples cited by Davidson and Faulkner. One of them was the jazz trumpeter, band leader, singer, composer and arranger Louis Armstrong, who moved the boundaries of what was possible in his day. Despite his humble beginnings, a remarkable series of pathways opened up to him, thanks to alignments, competencies and opportunities that enmeshed. In brief, Louis accompanied a junk cart on its round as a very young child, using a cheap tin horn to call for rags and bones. He also had ample musical opportunity during his very early childhood, singing at street corners in a vocal quartet while begging for money. In this milieu he was exposed to the gatekeepers of New Orleans jazz. Another aligning factor was that at seven years of age, Louis was taken into the home of a Jewish family who gave him money to buy his first real instrument, and although this arrangement did not work out and he ended up in the Waifs' Home for Boys, he was then nurtured by the institution's music instructor. In early teenage years, after hanging out with various bands and experienced musicians in the back streets of New Orleans, Armstrong was taken into the Kid Ory Band, where he learned the fundamentals of his craft, trialling and experimenting. A next key marker of his performance and

creativity occurred when he joined the famous Marable Band on the Mississippi paddle steamers, where he not only improved his abilities in improvisation but was also forced to learn to read music and develop his skills in scat-singing to relieve his sore, tired lips from the high-pressure trumpet solos that he was developing.

This brief and somewhat cursory exploration of the meetings, reinforcements and supporters in Armstrong's complex early life begins to show how alignments bring creative depth, focus and concentration to skill development and motivation in order to continue engaging and learning. While the alignments will never be identical for any two individuals, this example reveals how different yet interconnected experiences of relatedness can manifest and then possibly amass to become a critical determinant in how as well as how much an individual will feel motivated to continue with his or her focused musical endeavours.

The study of syzygies first became relevant to the current authors when investigating their cohort of students over fourteen years, in particular when undertaking detailed case studies of some who persisted with musical engagement into their twenties, but who engaged in very different ways (McPherson et al. 2012). With the capacity to take soundings at frequent intervals, it was possible to generate detailed insights into the musical lives of many students. One particularly noteworthy case was Tristram. While his school reports revealed him to be creative and conscientious, the playing itself evinced no special qualities in the earliest days. Success would not necessarily have been predicted. But the niche in which Tristram grew up was favourable: his mother was a primary school teacher, whose caring and structuring influence facilitated her son's musical engagement. Added to this, his brother and sister played in the school concert band. There was a family script that supported all the children's participation in music: the brother played trumpet and the sister learned the flute, and Tristram diversified the script even further by learning timpani.

A move to high school, an inspiring school music programme and a supportive teacher offered Tristram the opportunity to learn bassoon—a further development of the script. Tristram was flexible, often experimenting with music and finding new musical opportunity for himself. He was positively charged and motivated by his relatively quick progress on bassoon, which was regarded as a difficult first woodwind instrument. The alignment that led to his playing an unusual instrument, coupled with praise of Tristram's interaction with it, motivated him to practise with alacrity. Besides the orchestral opportunities afforded by learning both timpani and bassoon, his excellent school music programme also allowed further musical diversification and growth in his reputation as a student who could play many instruments. These configurations led to musical skill development within appropriate social networks in which Tristram flourished as a collaborative musician. It seems that his temperament led him to these social contexts. Indeed, given his characteristic 'give

it a 'go' attitude, it was unthinkable that he would refuse an opportunity to learn the vibraphone and join the school jazz band. So, by thirteen years of age, Tristram had a rich and constantly developing identity as a highly creative musician within the school context. By sixteen, this scope had expanded even further, when he was also performing as a singer/actor in school musicals. His investment was considerable, and the rewards were the unfurling successes as a musical learner, collaborator and ensemble performer.

Many syzygies contributed to Tristram's musical development. His teachers were particularly influential. When reminiscing about them, he was able to tease out the skills that each person had helped him to develop. There was particular focus on the creativity and stimulating intellect as well as personal warmth of each person. His parents were extremely influential—his mother in the primary school context and his father as a jazz aficionado. Each parent offered expertise that contributed to Tristram's emergent musical self. There was even some transference of experience in that Tristram's mother was so stimulated by her son's musical life that she retrained as a music specialist to work in the primary school context.

Tristram continued successfully through to age seventeen, hitting many of the markers of musical achievement, but within a very short period of time he decided to study architecture at university and gradually gave up playing. There seemed to be two principal alignments that resulted in his ceasing to invest in his musical learning. The first was meeting a student four years his junior who was at a much higher level of musical expertise. The result was a critical appraisal of his situation: 'It just seemed like, oh my god, this is ... ok ... you can do it, but I can't... Why am I doing this? Am I really good enough to do this, particularly with the bassoon[?]' (McPherson et al. 2012: 163). The second alignment had a strong connection to this first one. In order to achieve a very high standard of bassoon performance, he was advised that he would not be able to persist with jazz, improvisation and music-making; rather, he would have to invest in more repertoire-focused practice on the bassoon. This trade-off was one that Tristram was not prepared to make. He had attained the core skills for fluency, enjoyment and artistic expression, but was not willing to put in the work required to 'stay there' at a level sufficient to achieve ongoing professional status limited to one instrument. Indeed, he had always resisted formalized assessments in his music-making or committing to a single instrument or a single musical style.

### Developmental phases of musical attainment and excellence

The discussion throughout this chapter has highlighted the positive environmental and intrapersonal factors to support the engagement and discipline required to achieve musical competencies while also reflecting the theoretical

ideas offered in self-determination theory and syzygies. Work from sports psychology has characterized the key phases through which the learner's behaviour and beliefs pass in the progression towards high achievement. Because many of the findings in sports literature are similar to those in music learning, the framework shown in Figure 1.4 was adapted for music to depict the pathway along which many students proceed in order to attain and sustain high levels of musical engagement and achievement (McPherson et al. 2012).

Consonant with both the findings of Davidson et al. (1997) and Louis Armstrong's early biography, the representation in Figure 1.4 reveals that sampling in the earliest years is vital to aligning intrapersonal with environmental factors. This creative opportunity present in all our data is not perhaps sufficiently emphasized in this model. Also, although the model refers to a positive family, we know from the case of Armstrong that this 'family' might be an assumed one, such as the Jewish people who fostered him. Additionally, in some instances it could be that the family need not use direct encouragement but simply must not impede the young learner's progress. It seems, however, that encouragement in a nonthreatening and supportive environment is crucial for subsequent engagement; this is borne out by the overarching research findings and is consistent with our brief case study of Tristram.

Once this musical identity is formed, it seems that a specialization focus is required, where more and more specific, musically focused activities are encouraged within a context in which the music learning is positively endorsed. These focused activities include understanding and engaging music's expressive structures and functions in an ongoing manner. With all of these alignments in place, the learner is able to proceed to a transitional stage where music starts to be prioritized. Recall, for example, that in the fourteen-year study, those individuals who persisted across the entire study period were often engaging in as many as fourteen musical activities a week. In other words, for these individuals music was the highest priority in their lives. Once these sampling and specialization stages are attained, it seems that the learner then moves into an investment stage. Data from our fourteen-year study reveal that this investment is not just for the learner, in that parents often make significant adjustments in their own lives to accommodate and support the child's growing interest and specialization. The most extreme case that we have reported is of a musical prodigy whose mother moved with her from Hong Kong to New York so that she could study at a prestigious music school (McPherson and Lehmann 2012). It was also commonly reported by Davidson et al. (1997) that the parents in the study joined the school band committee or took on other significant, life-changing routines in order to accommodate their child's learning. In the case of Armstrong, who did not have this specific parental support, many role-model teachers were nevertheless active, and his own early life changed so rapidly that music-making offered the single mechanism through which his identity was expressed, enabling him to work with highly supportive teacher/role-model

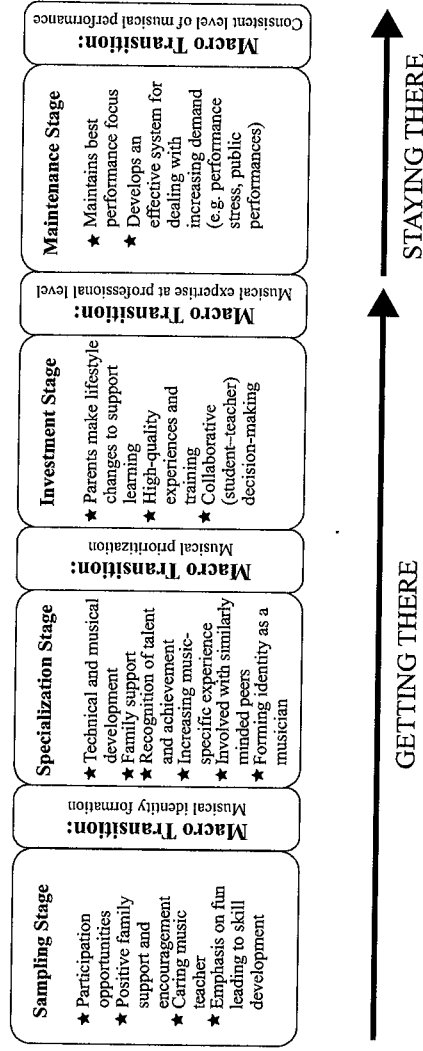


FIGURE 1.4 Stages for musical development (adapted from sports-related model by Abbott and Collins 2004)

figures. The learners themselves certainly reap the benefits of high-quality experiences, such as attending music camps or specialized masterclasses, touring with their regional youth orchestras, or, again, as Armstrong's case reveals, working with professional musicians from early on in contexts where high-level investment in music is achieved. For us, this is the most critical of the transitions, given that the vast majority of children who learn instruments cease instruction before reaching this investment stage.

Figure 1.4 also accounts for Tristram and other cases in the research data of students who despite every positive early and midstage experience and competency in performance give up after only a short period in the more elevated area of expert performance, where the desire to maintain skill seems to diminish rapidly. In Tristram's case, the requisite singularity of focus seemed to elicit concern, robbing him of the enjoyment associated with improvisation. According to the model of Abbott and Collins (2004), it appears that a mechanism needs to be in place to sustain and develop the increasing demands brought by professional life, and if this is not present, the learner will cease, sometimes in a rather dramatic way. As pointed out by Burland and Davidson (2004), the extremely talented young professionals in their study were acutely aware of this and developed personal strategies to cope with a range of factors affecting their lives. In the framework of self-determination theory, as mentioned earlier, this might be regarded as being able to keep a focus on competency and be ever flexible to deal with new and emergent circumstances demanded by the context of professional engagement.

### Our musical lives

Throughout this chapter, evidence has been triangulated from biographical case studies and large-scale longitudinal studies of young learners proceeding from first learning through to adult professional expertise, in addition to a number of other studies undertaken with highly engaged music learners, including one of a musical prodigy. Theoretical models from educational and sports psychology have assisted in showing the specific factors that are required to offer appropriate catalysts and the sustaining of investment to follow a pathway necessary to achieve musical excellence. By using these conceptions and drawing on research findings across the past twenty-five years, it is only now that a comprehensive picture can frame some of the even more complex questions that researchers will need to address in the decades ahead. In particular, it is suggested that new insights would be obtained by explaining creative expression in terms of the gravitational pull of a number of other circumstances and characteristics within a syzygistic model (which typically is micro-personal, factoring in social alignments) of an individual's musical development. While these micro routes to achieving excellence will

always be highly personalized in any domain, it is evident from the data encountered in this chapter that several fundamental psychological and developmental needs must be satisfied and underpin macro-level music learning and progression. Increasingly, we realize through our research that the key to an enjoyable and fulfilling musical life lies in the degree to which an individual's psychological needs are fulfilled at every stage of his or her learning. The fact that much can be done to meet these needs has significant implications for the refinement and updating of educational systems that could be employed to support musical development.

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