



## The social context of musical success: A developmental account

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This paper brings together extensive data from 257 children to explore the relative importance of social-environmental factors during critical periods of children's musical development. The paper also presents preliminary findings from a follow-up of 20 of the most musically successful children 8 years later to determine which childhood factors predict differences in success as adult performers. Those children who continued to play an instrument started at an early age, had higher parental support in lessons, and had first teachers who were friendly but not too technically able. However, these factors alone were not sufficient to predict relative success in childhood. Successful childhood musicians also appear to need teachers who are 'not too relaxed' and also 'not too pushy' and they also need to do substantial amounts of practice. The follow-up study suggested, though, that successful adult performers were not those who did the most practice; rather, the successful adults were those who took part in more concert activities in childhood, did more improvisation, and who had mothers at home in their early years. The results are discussed in relation to theories of musical development and the changing influences of parents, teachers and peers.

Research into the development of musical ability has primarily focused on the individual's acquisition of skill (e.g. Ericsson, Krampe, & Tesch-Römer, 1993; Hargreaves & Zimmerman, 1992) and amount of individual practice has been shown to be a good predictor of musical success (Sloboda, Davidson, Howe, & Moore, 1996). However, the acquisition of a skill can be both lonely and boring (Csikszentmihalyi, Rathunde, & Whalen, 1993). How do children maintain their motivation and their commitment to practice? Freeman (1991) claims that successful musicians have innate capacities for focusing on a task. Others, such as Feldhusen (1986), Kemp (1982, 1996) and Albert and Runco (1986) have emphasized aspects of musicians' personality, self-concepts, confidence and sensitivity. While such characteristics provide some explanation for the

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individual's ability to work alone for long hours and may reflect a 'talent', one must also consider the differential role that social factors play in maintaining children's motivation and facilitating the acquisition of skills (Davidson, 1997; Davidson, Howe, & Sloboda, 1997; Hargreaves, 1996).

Manturzevska (1990) has proposed a model of the development of professional musicians that focuses on the social context of learning. During early childhood, Manturzevska emphasizes the role of parents in the development of spontaneous expressional activity; and from mid-childhood through to young adulthood, the importance of the relationship between teachers and pupil is seen as critical. However, there are other social contexts not considered in this model; for example, what is the role of friends and peers? The current paper presents a more detailed examination of these social influences and considers their differential effects during the initial period of musical development, through childhood, and into young adulthood.

### ***The influence of parents***

Research suggests that highly musically skilled children are introduced to music because of the interest of at least one parent (see Bloom, 1985). Parents also have an important practical role to play in providing transport to, and attending lessons, rehearsals, auditions and competitions, and in meeting the direct economic costs of these activities (Bloom, 1985; Freeman, 1985). Parents also provide social and emotional support; more able children are likely to have highly supportive parents who provide a 'safe and steady' home environment (Sosniak, 1990). Mönks and Van Boxtel (1985) and Freeman (1991) suggest that when parents offer a combination of both warmth and reason, children show greater respect and trust in their parents' opinions and judgments and are more likely to share their parents' values. Furthermore, parents of high-achieving children are more likely to work with their children rather than simply telling them what to do, and are more consistent in supporting activities whether or not they are going well (Freeman, 1991; Sosniak, 1990). On the other hand, overly demanding and insensitive parents may inhibit learning. Freeman (1991) suggests that if too much pressure is placed on children they may feel forced to subdue their personalities and miss out on childhood freedoms. Furthermore, some parents may make their children symbols of their own achievements as a way of compensating for their own feelings of inadequacy and guilt (Gallagher & Coche, 1987). It is evident that parents can have a significant influence on the musical child's progress, but it is still to be determined which aspects of parenting are critical in determining children's success as adult musicians and the relative influence of parental input compared with that of teachers and peers.

### ***Teachers and schools***

Teachers are important role models (Freeman, 1991), and an inspiring teacher may be essential to engage a child with a new domain. Csikszentmihalyi *et al.* (1993) view the warmth of the teacher's personality as being critically important. This can be manifested in the teacher behaving like a counsellor, recognizing the child's emerging needs and steering through the pathway to finding attainable goals (Freeman, 1991). However it is unclear the extent to which a child's interest is developed through identification, or as a product of their teachers' enthusiasm, and to what extent a child's success is a product of the teacher's adoption of sensitive and supportive instruction techniques.

Bloom's (1985) 5-year study of talented children in a number of domains revealed

three critically important phases in the relationships between pupil and teacher mapping onto the changing stages of skill acquisition. In the early stages of learning, having fun is important and the teachers of more able children were remembered both as being enthusiastic and also as generous; rewarding any small interest or involvement in the particular talent area. In the second stage, the learning of precise skills and the development of an objective sense of achievement are the main goals. Children in this phase value the constructive criticisms of their teachers, who now demonstrate their own professional skills while continuing to encourage the child to participate in musical activities. In the third and most difficult phase, the student-teacher relationship no longer relies on a good personal bond but focuses on shared dedication to the domain. Developing this new style of relationship, as a co-expert rather than a friend, may be particularly difficult (Sosniak, 1990). This paper allows us to explore whether Bloom's suggestions regarding the changing role of the teacher are valid and to assess the impact of teachers relative to other social and individual factors.

### **Peers and friends**

Friends have a major impact on children's attitudes and behaviour (Hartup, 1996). During adolescence, in particular, peers may have a far greater influence on behaviour than families or teachers do, and may be critical for the establishment of self-esteem and identity (Patterson, DeBaryshe, & Ramsey, 1989; Urberg, 1999). While there is much interest in the negative effects of peer groups and the development of antisocial behaviour (Ennett & Baumann, 1994; Urberg, Değirmencioglu, & Pilgrim, 1997), peers can also have a considerable positive influence on academic achievement (Kinderman, 1993). For example, when peers are working towards a mutual goal, there is emerging evidence that cooperation can raise the level of performance of those individuals beyond that which they may achieve on their own. This may also help the development of prosocial skills and improve self-esteem (see, e.g. Doise, Mugny, & Perret-Clermont, 1975; Johnson & Johnson, 1989; Light & Glachan, 1985; Roazzi & Bryant, 1998). Also, when older children help in the tutoring of younger peers, not only does the tutee benefit in terms of developing new skills, but the tutor also benefits by gaining more insight into their own skills, and may gain more empathy with their own teachers (Greenwood, Carta, & Kamps, 1990). The presence of friends in the classroom can create a positive working environment and help children to adapt to school transitions, enhancing the likelihood of success (Jehn & Shah, 1997). Friends are more likely to share information, talk through emotional and moral issues, and show high levels of mutual commitment to tasks, as a result of emotional ties.

Thus, in the development of musical competence, peers are likely to exert a powerful and important influence on development (Urberg, 1999). Indeed Sosniak (1990) suggested that peer role models have a great influence on talented musical learners, especially if slightly older students are seen by younger learners to set attainable standards to aim for. For this reason Freeman (1985) has argued that the child showing signs of 'musical talent' is best placed within specialist training schools surrounded by like-minded peers. However, not all children who attend specialist music schools will become performing musicians. Simply being with peers may not be enough to facilitate musical development; there are likely to be specific contexts which are of more benefit than others. Thus, to understand more clearly the beneficial role of peers in musical development we need to examine the different situations in which peer influences operate (Coleman, 1960; Gecas & Mortimer, 1987).

## Aims

The social context of learning appears to be critical for sustaining motivation and for the development of musical skills; however, there is little research into musical development that has concurrently examined a full range of social influences. While in our previous papers we have demonstrated that parents, teachers and individual factors all have significant influences on the development of musical achievement in childhood (Davidson, Howe, Moore, & Sloboda, 1996; Davidson, Moore, Sloboda, & Howe, 1998; Howe, Davidson, Moore, & Sloboda, 1995; Sloboda *et al.*, 1996), these papers did not give an account of the relative influence of these factors, nor did they allow an examination of their differential effect at critical periods of development. Thus, in the current paper we present two discriminant function analyses (DFA) using our original data to determine the relative influence, during the initial period of playing and during subsequent years, of a fuller range of social and environmental factors on children's subsequent level of musical competence. Secondly, we present an analysis linking the original childhood data to a new set of data from two subsamples of the musically successful children followed up into adulthood. This has allowed us to examine longitudinally those childhood factors that may predict success as an adult and to determine the necessary and sufficient factors required for musically successful children to develop into successful adult musicians.

## DISCRIMINATING BETWEEN CHILDHOOD MUSICIANS

### Method

Structured interviews (after Robson, 1993) were administered to groups of children and their parents to investigate a range of biographical factors, as suggested by Sloboda and Howe (1991).

### Participants

The participants were 257 children and adolescents aged between 9 and 19 years old when interviewed. In previous studies these children were divided into five groups reflecting different levels of musical success and educational contexts. Given the smaller number of participants in three of these groups (referred to in previous papers as groups 2, 3 and 4), and given the previously reported similarities between these groups, these children were pooled to form a group of 'continuing musicians'. Hence for this paper three groups are identified:

- *Group 1: Successful childhood musicians.* These were 119 children who attended a specialist music school and who were deemed to be 'prodigiously able' for their age and stage of development.
- *Group 2: Continuing childhood musicians.* This group consisted of 80 children of whom 30 had applied but failed to gain a place at the specialist school, but who were competent for their age; 23 who had expressed an interest in attending the specialist school, but did not pursue it further; and 27 children who attended a state school, were in receipt of instrumental tuition, but who regarded music only as a hobby.
- *Group 3: Children who gave up.* This group consisted of 58 children who had played an instrument for at least 1 year, but who had given up learning at least 1 year prior to the study taking place.

When interviewed, the groups were equivalent in age (overall mean = 14.8 years), in the age they started their first instrument (overall mean = 6.4 years), and in the mean age they started their main instrument (overall mean = 8.2 years). They were also comparable in the breakdown of gender and in the type of instruments they played, with one-third of children falling into each of the instrument categories of keyboard, strings, and woodwind or brass. There were no differences between the groups in the distribution of the occupations of fathers and mothers, with around two-thirds of the mothers and three-quarters of the fathers of the children in all three groups employed in professional and clerical jobs.<sup>1</sup>

### Measures

Questions were asked about early musical behaviours and influences of the child and parents; group activities, lessons, motivation and practice; parental influences during periods of musical development; and the qualities of music teachers. A wide range of demographic information was also taken. Changes in behaviour over time were recorded in 1-year or 3-year periods. Note that the data for the children who gave up (group 3) were only available up to the third year of playing.

#### *Early musical influences*

These questions established when the child first demonstrated musical behaviours, such as singing or rhythmic dancing; and when the parents first took part in musical activities with their children, such as singing to them or listening to music together. Parents were asked to recall the earliest age these occurred to within 6 months (see Howe *et al.*, 1995).

#### *Parental influences*

Questions on family influences focused on parental involvement in lessons at different ages; parental involvement in supervising the child's practice at different ages; parents' own involvement in music; and parents' own change in musical involvement over the child's music-learning period. For the majority of questions, the interviewees were given four response categories from which to choose the appropriate response. For the question on involvement in music there were five response categories. The scale ranged from no involvement (1) to an active involvement (4 or 5). Other questions were also asked about the family environment and siblings (for more details see Davidson *et al.*, 1996).

#### *Teacher characteristics*

Each teacher who had tutored a child was rated using a 7-point ordinal scale measuring: friendliness; how relaxed; how chatty; how encouraging; how pushy they were; and the teacher's playing ability and overall ability as a teacher. Each scale was indicated by bipolar adjectives, with a lower score indicating a positive rating (see Davidson *et al.*, 1998). Children and parents were also asked to give the dates when the child changed teacher and to state the amount of time (in months) that the child had studied with each teacher on each instrument learned. Children and parents were also asked to say why

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<sup>1</sup>More detailed information is available on request.

there were changes of teacher and whether lessons were given in individual or group sessions (see Davidson *et al.*, 1998).

#### *Motivation, practice, lessons and peer group activities*

Questions were asked about motivation to practise and average daily formal practice time in minutes. Motivation was rated on a 4-point scale from entirely self-motivated (1) to 'would not practise without parental insistence' (4). These were estimated for each instrument learned and for each year of learning since they began playing. Participants were also asked to estimate time spent on three other activities: improvisation, playing previously learned and favourite pieces, and unstructured informal activities ('messaging about'). Participants were asked to rate whether their level of these activities was greater than, the same as, or less than, the amount of formal practice. However, children found this difficult to recall, so binary measures were constructed which simply indicated *any* incidence of these behaviours in each year of playing (see Sloboda *et al.*, 1996). Information about other musical activities was also recorded. For each year of learning, the average weekly duration of instrumental lessons was determined, together with the number of group activities, concerts and competitions in which the individual took part. Information was also obtained about the achievement level of the participants at various ages. The age at which participants achieved each grade level of the Associated Examination Board (AEB) was also noted (see Sloboda *et al.*, 1996).

#### **Procedure**

While the ideal method of study would be to observe directly the circumstances surrounding the emergence of musical skill from birth through to adulthood, very large samples would be needed to be able to trace the small number of learners who persist to become skilled adult musicians. For these reasons, most of the existing research has relied on retrospective interviewing methods (see Manturzewska, 1990; Sloboda & Howe, 1991; Sosniak, 1985). One problem with such methods is the unreliability of memory over the life-span. While we also employed retrospective methods to obtain early childhood data, we attempted to increase reliability by using a more structured interview technique in which child and parent were interviewed independently and in which corroborative evidence for responses was sought. In addition, as a substantial proportion of the sample had only recently started lessons and were very close in time to the events they were being asked to recall, this helped us to ensure the validity of responses.

Each child was interviewed alone either face-to-face (75% of the interviewees) or by telephone (25% of the interviewees). In addition, at least one parent was interviewed in a similar manner (75% by telephone and 25% in person). Target questions were used to establish the reliability of the children's responses. From a total of 514 interviews, there was only one case where child and parent disagreed. In order to ensure that interviewees had time to locate any documentary evidence (diaries, reports etc.) that would assist them in providing accurate answers, two advance notifications were given. It was also made clear that if a respondent did not know or could not recall the answer to the question, she or he should say so.

In all face-to-face interviews a separate chronological grid was employed for each instrument, facilitating recall and enabling specific points in the child's playing career to

be related to other events (Associated Board examinations, birthdays etc.). In the telephone situations, the interviewer would read out the relevant related events. From these responses, mean levels of involvement across all instruments were computed for each age period. The absolute number of children for whom it was possible to collect data about parental involvement and motivation at young (3–5 years) and older (15–17 years) ages was often small, because many children did not begin learning instruments until the age of 6 years or older, and because many of the participants in group 3 had given up prior to 15 years of age. All responses were coded at the time of interview, and interviews were tape-recorded so that the reliability of the original coding given by the interviewer could be checked. Taking a sample of 10 interviewees, an inter-rater concordance of 95% was found between two independent raters in the coding given.

## Results

The first discriminant function analysis (DFA) was conducted to ascertain which measures of early musical behaviour and experiences discriminated between children who gave up, children who continued as musicians, and children who became highly successful musicians. While we had many measures for the successful and continuing childhood musicians, data were only available during the first 3 years for group 3 and they had usually only been tutored by one teacher. However, for a number of cases there were still missing data. A complete set of measures of early musical influences and experiences were available for 157 of the 257 children (group 1,  $N = 87$ ; group 2,  $N = 49$ ; group 3,  $N = 21$ ). A stepwise analysis was performed using the data from these 157 participants using Wilks'  $\lambda$  method. As estimates of the likelihood of group membership for this cohort were unavailable, the prior probabilities of group membership were assumed to be equal (.33 for all three groups). The first function derived accounted for 96.6% of the variance ( $\chi^2 = 78.72$ ,  $df = 8$ ,  $p < .001$ ). The second function contributed little to the discrimination (3.4%;  $\chi^2 = 3.15$ ,  $p = .37$ ).

The analysis selected four variables on the basis of which successful discrimination could be made. Table 1 shows the four variables selected, the means for each group, and the standardized function coefficients.

Table 2 presents the classification table based on these discriminant functions. The hit rate of correct classification when generalized to the whole population sample of 257 children (having used mean substitution for missing data) was 54.5% (chance being 33%). While this is not particularly high overall, the model was reasonably successful in classifying the group of children who gave up, with a hit rate of almost 70%.

The first analysis showed that children who are likely to give up had a relative lack of early parental involvement in lessons, along with a late age of starting, and had technically better but relatively unfriendly music teachers. However, the lack of power of this model in discriminating continuing childhood musicians from the prodigiously successful children suggests that other factors, in addition to measures of early musical behaviour and influences, are needed in order to develop a model that will discriminate between these groups.

Hence a second DFA was performed which excluded the group of children who gave up. This allowed a more comprehensive set of measures of environmental influences to be used, including measures of musical behaviour from beyond the first years of playing. The stepwise DFA (using Wilks'  $\lambda$  method) extracted a function derived from seven variables ( $\chi^2 = 53.28$ ,  $df = 7$ ,  $p < .001$ ; see Table 3).

**Table 1.** Discriminant function analysis (DFA) for children of three levels of musical success

Variable	Mean score group			Step	Wilks' $\lambda$	Standardised coefficients	
	1	2	3			Function 1	Function 2
Parental involvement in lessons over the first 3 years on their main instrument	2.9	2.6	2.0	1	.89	-.57	.27
Rating of the abilities of their first teacher as a player	3.1	2.2	1.8	2	.81	.49	-.50
Age at which lessons began	6.0	6.5	7.4	3	.76	-.554	.07
Rating of the friendliness of their first teacher on their first instrument	2.0	2.1	2.6	4	.70	.638	.822
N for analysis	87	49	21				
Group centroids for function 1	.59	-.12	-1.04				
Group centroids for function 2	.01	-.18	.11				

Notes. Canonical correlation for function 1 = .54; canonical correlation for function 2 = .12.  $\chi^2$  for function 1 = 78.72 ( $df=8$ ;  $p<.001$ );  $\chi^2$  for function 2 = 3.15 ( $df=3$ ;  $p=.37$ ).

**Table 2.** Classification success for the first discriminant function analysis (DFA) showing predicted against original group membership

		Predicted membership			Total
		Group 1	Group 2	Group 3	
Original	Group 1	65 (54.6%)	34 (28.6%)	20 (16.8%)	119
	Group 2	19 (23.8%)	36 (45.0%)	25 (31.3%)	80
	Group 3	4 (6.9%)	15 (25.9%)	39 (67.2%)	58

*N* for classification = 257 (mean substitution).

Overall correct classification = 54.5%.

The first teacher's friendliness and ability as a player continued to be important discriminators in this model. However, the first teacher's pushiness also added to the two-group model, with the successful children reporting having had less 'pushy' first teachers. Other measures that discriminated between the childhood musicians were: how relaxed their most recent teacher was, with the teachers of successful children being less relaxed; the amount of practice on their first instrument in their first year; the amount of practice done in their fourth year of their main instrument; and the cumulated amount of practice done by age 11 years. Children in the more successful group evidenced greater amounts of practice on these measures. The function produced a much better rate of classification for the two groups than that obtained in the three-group analysis (see Table 4) with the overall classification rate being 72%.

## Summary

In sum, the two discriminant function analyses provide evidence that the age at which children start their lessons and the amount of parental involvement in these lessons, along with having a friendly teacher who need not be rated as being a good musician, are critical in determining whether children continue to be musicians or give up. However these factors alone, while necessary, are not sufficient to discriminate those who are more successful musicians as children from those who are less successful. It would appear that to make this discrimination we need to take into consideration the amount of practice children do at the commencement of playing, the amount of practice cumulated by age 11 years, the ability to sustain practice into their fourth year of playing their main instrument. Also we need to consider how relaxed their most recent teacher is. Using such measures we can be fairly certain of classifying children into those who are successful as children and those who are not.

The development of a model that can predict whether children are likely to be more or less able childhood musicians on the basis of childhood early measures promises to serve a useful function in helping educationalists identify strategies for improving children's musical experiences. However, such a model is incomplete as an account of musical development unless it can also predict which children will go on to be successful in adulthood.

**Table 3.** Discriminant function analysis (DFA) for two groups of children of differing musical success

Variable	Step	Means for each group		Wilks' $\lambda$	Standardised coefficients
		Group 1	Group 2		
Amount of formal practice on their main instrument in fourth year of playing (minutes per day)	1	76	31.2	.82	.57
Rating of how good a player their first teacher on their main instrument was	2	3.6	2.7	.76	.58
Rating of the friendliness of their first teacher on their main instrument	3	1.8	2.6	.72	-.56
Cumulated amount of practice by age 11 (in hours)	4	1694	837	.68	.59
Rating of the relaxed nature of their most recent teacher on their main instrument	5	2.3	1.8	.65	.39
Rating of pushiness of their first teacher on their main instrument	6	4.0	2.6	.63	-.403
Amount of formal practice done on the first instrument in first year of playing (minutes per day)	7	18.8	15.4	.60	-.35
N		70	42		

$\chi^2 = 53.28, df = 7, p < .001$ .

**Table 4.** Classification table for discriminant function analysis (DFA) of two groups of musicians

		Predicted membership		
		Group 1	Group 2	Total
Original	Group 1	80 (67.2%)	39 (32.8%)	119
	Group 2	17 (21.3%)	63 (78.8%)	80

*N* for classification = 199.

Overall correct classification = 71.9%.

## DIFFERENCES IN CHILDHOOD MEASURES BETWEEN PROFESSIONAL PERFORMING AND NON-PROFESSIONAL ADULT MUSICIANS

### Method

In this final section we examine two subgroups of individuals from the original 119 successful childhood musicians to establish childhood factors that determine success as an adult. We contacted 20 participants 8 years later and established their success as adult musical performers. A qualitative account of interviews with these participants has been presented elsewhere (Burland & Davidson, 2002).

### Adult participants

The 20 participants were aged 18–26 years old. Participants were selected through a process of snowballing; contact numbers provided by the school were used to contact musicians, and these individuals provided contact details for other individuals. Two clear subgroups emerged: the first comprised nine individuals who, as young adults were currently pursuing professional musical performance careers (orchestral musicians, string quartet members and, in one case, an international-level professional solo career), these shall be referred to as the *professional musicians*; and the second comprised 11 individuals who in adulthood were not involved in professional-level music-making (two were school teachers, seven were working in non-music careers, but played music as a hobby, and two had given up all involvement with music), these shall be referred to as the *non-professional musicians*.

It must be recognized that the sampling procedures used means that the groups are not taken randomly from the overall population. Thus we cannot be certain that the groups are entirely representative of successful and unsuccessful adult musicians. Also, given the small numbers, there is a possibility of making type II errors and misinterpreting a non-significant finding. However, while the data presented here were initially collected to see if there were any differences which might warrant a larger scale investigation, the findings were so striking that these initial data seemed worthy of publication even with these caveats.

While non-professional musicians were on average slightly older when they began their first instrument (5.4 vs. 6.4 years old) this was not a significant difference, nor did the groups differ in the age they began their main instrument, the age they were first

interviewed, nor in the age when interviewed for the follow up (*t*-tests, n.s.). The groups also did not differ in instrument type ( $\chi^2$ ) and showed the same distribution of maternal and paternal occupations as in the sample as a whole.

The two groups did differ from one another in their gender distributions (professional group eight males, one female; non-professional four male, seven female). The uneven distribution of the professional group does, however, reflect the uneven split (70/30 male vs. female) of gender at the music school (personal communication by the head of school and confirmed by examination of school records). Also, as gender differences had not been found when the measures had been examined previously, it was thought that the study would still provide useful and potentially generalizable results. Importantly, we did a further analysis on all the variables reported below to examine gender effects in group 1 as a whole (all 119 children) and found no significant gender effects on any of the measures. Thus, any differences found between the subgroups cannot be readily attributable to general gender effects.

## Results

### **Early involvement in music**

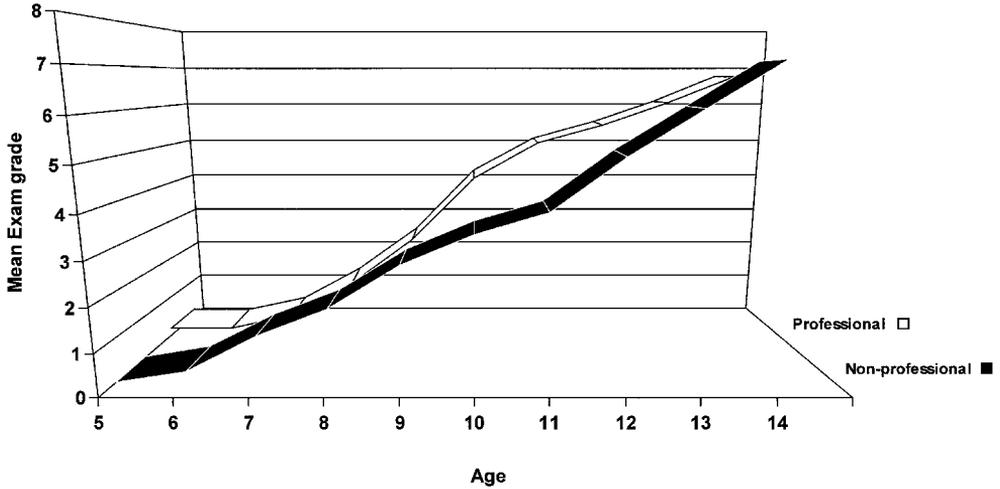
In the original analyses it was found that there were few indicators that people who were more able as musicians when children had shown signs of musical interest or ability as young children earlier than those who were less successful (Howe *et al.*, 1995). The only difference was in the reported age that the children first sang and the child's age when the parent and child first listened to music together, with reports that children in group 1 were younger when these occurred. When analysed in terms of the two subgroups, there were no differences between the professional musicians and the non-professional musicians in the reported age at which spontaneous musical activities were shown as children.

### **Examination grades achieved**

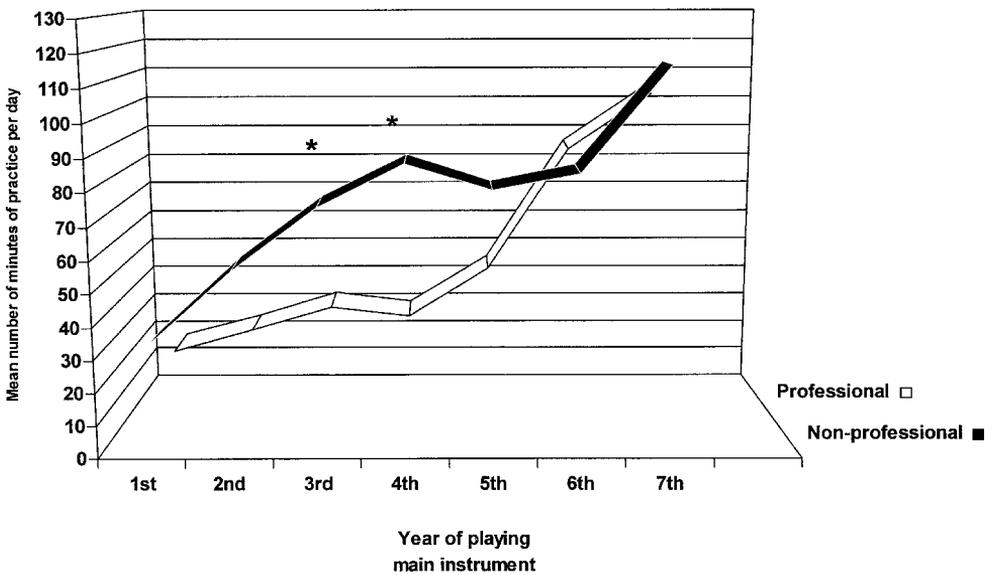
In the initial data set, group 1, as the most musically able, differed from the other groups in terms of their much higher grade achievements by the age of 11 years (Sloboda *et al.*, 1996). On this basis it might be predicted that within group 1, those children who became professional musicians would be likely, as children, to have reached higher grades earlier than those children who were non-professional musicians as adults. Figure 1 shows the examination grades reached by the two groups at each age from 5 to 14 years of age. No significant difference between the groups was found in terms of the average grade achieved up to the age of 14 years.

### **Amount of formal practice and length of lessons**

High levels of formal practice and long length of lessons have been reported here and in previous papers (i.e. Sloboda *et al.*, 1996) to be important discriminators of successful children from other children. In addition, previous analysis has shown that amount of practice was a good predictor of grade level achieved for all the childhood groups (also see Sloboda *et al.*, 1996). Thus, given that there appears to be no significant difference in grade level achieved over time between the professional and non-professional adults when they were children, it might be predicted that there would also be similar levels of formal practice undertaken by the two subgroups over the course of their childhood.



**Figure 1.** Mean best grade level achieved across all instruments at each age from 5 to 14 years of age by more and less successful adult musicians (note preliminary grade is given a value of 0.5).



**Figure 2.** Mean number of minutes of formal practice performed each day by each group over each of the first 7 years of playing their main instrument. Asterisks (\*) indicate significant difference.

Figure 2 shows the mean number of minutes of formal practice performed each day by each subgroup over each of the first 7 years of playing their main instrument. Perhaps contrary to expectations, it is apparent that the professional musicians did *less* practice when they were children than the non-professional musicians. The data were insufficient for a repeated-measures analysis, but independent *t*-tests for each year reveal significant differences in the amount of formal practice undertaken during the third and fourth years of playing their main instruments ( $t(16) = 2.38, p = .03$ ;  $t(14) = 2.62$ ,

$p = .02$ ]. This difference was not mirrored in length of lessons, with the two subgroups receiving the same amount of lessons over each year of playing.

### **Parents**

There was no difference between the two subgroups in their reports of parental involvement in lessons and practice, it being generally high. Almost all individuals reported that their parents had received regular feedback from teachers or were present at lessons. Additionally, all their parents had offered advice during practice or had actively supervised practice sessions. However, the subgroups did differ in terms of early access to their mothers as carers. All of the professional musicians had mothers who had been at home until the children went to school and more than 50% of these mothers had been at home until the child was 10 years old. In comparison, 63% of mothers of the non-professional musicians had gone out to work when the child was around 1 year old ( $\chi^2 = 8.81, p = .003$ ).

### **Teacher characteristics**

The professional musicians reported their teachers to be more pushy than the non-professional musicians, with 7 of the 8 who responded using the extreme end of the pushiness scale, compared with only 4 out of the 11 non-professional musicians who responded using this extreme of the scale ( $\chi^2 = 4.22, p = .04$ ). No other differences were found in the teacher characteristics of the subgroups.

### **Improvisation, playing favourite tunes, and messing about**

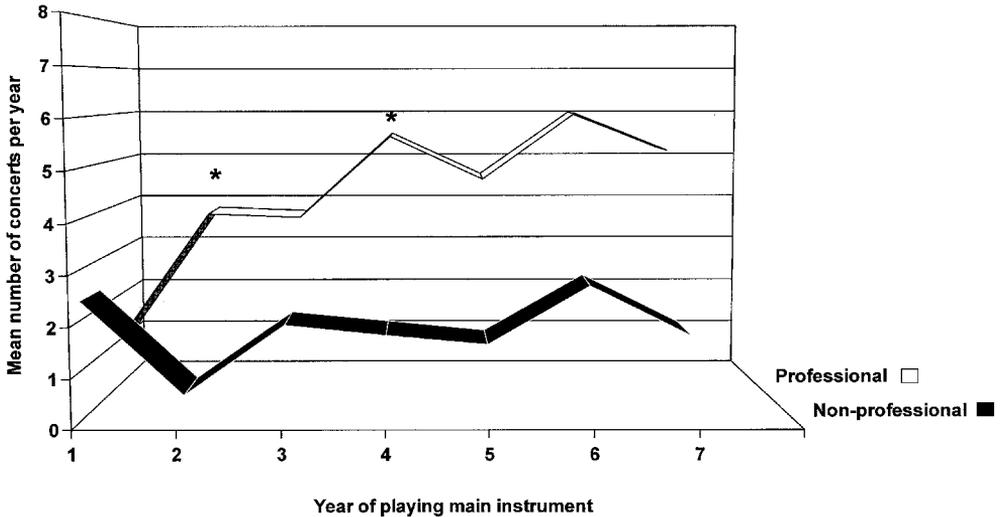
While there were no differences in the proportions of participants in each subgroup who reported playing favourite tunes and 'just messing about' at some point during development, there was some suggestive evidence for an association between taking part in improvisation during practice and success as an adult musician, with professional musicians being more likely to have reported engaging in improvisation than the non-professional musicians ( $\chi^2 = 3.11, p = .08$ ).

### **Participation in group activities**

Figure 3 shows the average number of concerts given by the two subgroups over each of the first 7 years of playing their main instrument. It reveals that from the second year of playing onwards, the professional musicians took part in more concert activities than the non-professional musicians. While the data were insufficient to perform repeated-measures analysis, independent *t*-tests revealed significant differences in the mean number of concerts performed during the second and fourth year of playing ( $t(12) = 3.193, p = .008$  and  $t(13) = 2.69, p = .021$ ). In comparison there were no significant differences between the subgroups in the incidence of other group playing activities, and no difference in their ratings of the importance of performance to their lives when they were children.

### **Intrinsic motivation, teachers' ratings and personal aspirations**

Almost all participants from both subgroups reported themselves to be entirely or at least partly self-motivated from the outset of playing their main instrument, and the two groups did not differ in this regard.



**Figure 3.** Mean number of concerts performed by each group over each of the first 7 years of playing their main instrument. Asterisks (\*) indicate significant difference (*t*-test).

When the participants were children, teachers at the specialist music school were asked to rate their adult potential on a 4-point scale: (1) no future in music at all; (2) a remote possibility of a musical future; (3) potential professional musician; (4) an outstanding musician of international solo calibre. Comparing the adult subgroups, there were no differences in the distribution of classifications across these categories by group ( $\chi^2$ , n.s.). None of the participants was ranked as having 'no future' but two in both subgroups were thought to have only a 'remote possibility of a musical future'. Two of the professional musicians and one of the non-professional musicians were ranked as 'outstanding'. The rest were all thought by their teachers to have professional potential. With regard to participants' own career aspirations when asked as children, all but one participant in both subgroups aspired to be a professional musician of some sort. However, while not statistically significant, a higher proportion (73% vs. 44%) of non-professional musicians had aspired to be solo performers.

## DISCUSSION

Our results can confirm the importance of social factors, described by Manturzewska (1990), in the progress of musicians over different periods of musical development from early childhood to young adulthood.

### Parents

Our results indicate that support provided by parents is necessary during the initial learning period. However, our analyses indicated that whilst parental involvement is necessary for continued learning, it may not be a critical factor in determining later success. Amount of parental support did not discriminate between the more and less successful childhood musicians and the professional performing adults did not report

receiving more parental support than the non-professional adults. Thus, an increase in parental involvement does not simply lead to an equivalent increase in achievement in childhood. While parental support in lessons and practice serves as a necessary support for learning, it is not in itself sufficient for musical success. In fact, non-intrusive parental support, where parents are not over-invested in the child's future, may be preferable. Indeed this would explain why it is not necessary that parents are musicians themselves for their children to be successful performers (Davidson *et al.*, 1996).

However, one predictive parental factor emerged from the analysis. All the mothers of professional musicians were at home during the child's early years, whereas the majority of mothers of the less successful adults went out to work by the child's first birthday. This effect cannot be explained as an indirect effect of SES, as the two groups were comparable in this regard. Perhaps because the mother and child were at home together there was more opportunity for musical experiences to be shared and the process of early music learning was more interwoven into the mother-child relationship. Consequently, these activities may have come to represent more positive emotional experiences, and may explain why, for professional performers, music seems so tied into their emotional life. As one girl commented:

I think [music] is a huge part of who I am. I have to be careful to make sure that there are still other parts . . . because it's so easy for music to become most of me.

### **Teachers**

Our results demonstrate the changing role of teachers during musical development. Children who gave up were discriminated on the basis of their teacher's friendliness, and this was also important for determining who became most successful as children. However, teachers of more successful children were also less relaxed. Manturzevska's (1990) model proposes that the teacher acts as a role model and that identification with the teacher is central to the child's motivation to learn (Freeman, 1991). However, while the more successful childhood musicians reported their first teachers as being friendly, they did not regard them as being particularly good players and rated them lower than the other children's teachers (Davidson *et al.*, 1998). This is not consistent with the idea of a role model. The findings do, however, map onto the findings of Bloom (1985) which revealed that the critically important characteristics of the first teacher are playfulness and friendliness.

It may be that a more detailed account of the role that teachers play in development is required, one that goes beyond the teachers simply as a role model. In recent years the influence of Vygotsky (see Wertsch, 1985) has led researchers to consider in more detail the role of social interaction in the acquisition of knowledge. Instructors are not simply seen as a role model or a transmission source but as a provider of scaffolds that support the child's learning through sensitive guidance and who thereby allow the child to enter into 'zones of proximal development' (Vygotsky, 1962). Thus the sensitivity in providing and then removing appropriate scaffolding is critical to the child's learning (Rogoff, 1990). More research is required to establish the exact nature of the influence exerted by music teachers during musical development, but the reports by successful musicians that their first teachers were particularly warm and friendly may indicate that these teachers were also good at providing sensitive scaffolding in the learning situation.

While a friendly teacher is a necessary factor in sustaining and developing a child's learning, this does not seem to be the determining factor in development as an *adult*

professional performer, there being no difference between the adult subgroups on this variable. However, one teacher characteristic did differentiate between the professional and non-professional performing adults, with professional musicians reporting, when interviewed as a child, that their most recent teacher was more pushy.

It seems that the roles played by parents and teachers in providing a supportive, encouraging and playful environment maximizes the likelihood of musicians pursuing a professional career in music. Through this support, musicians may develop a greater emotional involvement with music, greater self-confidence and belief in their abilities, and a more playful approach. Consequently, music learning becomes a more enjoyable and intrinsically rewarding experience. The suggestive (though non-significant) tendency for the professional adult performers to have engaged in more improvisation during learning may demonstrate both greater self-confidence and playfulness and suggests that this is also a determining factor in the development as a professional musician. Improvisation also, in turn, facilitates a greater understanding of the potential and range of their instrument and of musical form. Combining this with a later teacher who is a little more 'pushy' may be the final ingredient that leads to musical success. This is illustrated by the quote below from one of the non-professional adults.

Because he [teacher] was taking it so casually I think I did. If I'd had someone on my back all the time—I know X's teacher [X was a successful performer] was particularly on him all the time—about technique, and his performance—you've got to do this, and that really drove him; I didn't have anyone nagging me.

### **Practice and motivation**

Csikszentmihalyi *et al.* (1993) propose that a self-sustaining state labelled as 'flow' occurs when the individual becomes so involved in an activity that s/he loses track of time, and the experience becomes autotelic. Repetitive practice is one of the most important factors in determining success as a child and as an adult, and the attainment of self-motivating, self-sustaining states is central to the development of musical skills. Indeed the task is immense and requires exceptional application. Sloboda *et al.* (1996) suggested that 10,000 hours of practice needs to be accumulated in order to attain professional competency. In this study we found that both children's initial levels of practice and their sustained practice into the fourth year of playing their main instrument were important in discriminating between more and less successful *childhood* musicians; with more successful childhood musicians having engaged in more initial and sustained practice than the other children.

This capacity to engage in and sustain practice and focus completely on the task has been assumed by some to be a constituent factor of successful individuals; reflecting a constant personality trait that persists across the life-span of musicians (i.e. Freeman, 1991). However, high levels of motivation and focus are as likely to be a product of early social support as they are to be a product of genetically determined traits. Sensitive and positive support from teachers and parents, engagement in instrument playing in a social context, and the consequent adoption of a playful and emotional engagement with music, may be the source of self-confidence and self-motivation.

### **Peers and friends**

The role of peers may be particularly important in sustaining interest during adolescence, when the child's sense of self and individuality is developing (Coleman,

1960). Sosniak (1990) found that peer role models were especially influential when a slightly older student is seen by a younger learner to set attainable standards to be emulated. Perhaps this is why the greater involvement in concerts and associated rehearsals discriminates between the adult musicians, along with the obvious benefits of actually performing. It may be that engaging with music alongside peers in less formal and more sociable settings is a critical component of success. Concerts, and particularly rehearsals, may provide a more relaxed and cooperative forum in which peers can discuss their music with others and develop their sense of a musical self. Certainly studies on the development of other skills in childhood suggests that collaboration with peers during learning may be more productive and socially beneficial than the sort of competitive environment typically associated with music learning (Johnson & Johnson, 1989). Further research into the unique nature of the interactions that peers have during concert rehearsals and group learning situations will help to establish the role of peers in the development of skills and motivation.

### ***Practice and burnout***

We conclude that, at the very least, the professional adult musicians maintained their motivation as a consequence of these supportive peer groups. In comparison, the non-professional musicians invested more of their music-learning time in the isolation of individual prescribed practice. In fact, the non-professional adults engaged in significantly more formal practice (scales, technical exercises etc.) than the professional musicians in the first few years of playing, but this difference was not sustained. Lack of social contact and peer support, combined with high intensity but isolated practice may serve to de-motivate childhood musicians and lead to so-called 'burnout'.

By the sixth year of playing, the children who became professional performers matched the levels of practice of the non-professional subgroup. This suggests that the best form of motivation is one that encourages children to practise at only modest levels at the beginning but to also take part in group activities which in turn may provide the social context in which self-motivation may be fostered. Indeed early motivation to just practise and practise may be a negative trait; while both groups reported equal levels of ambition and motivation, perhaps the focus of their motivation was different. This may also explain why teachers in the specialist school were poor in picking out those children who they thought would become successful performers, as they may have been doing so on the basis of early commitment to practice.

In future we need to explore in more detail how to motivate children to both engage in practice and also to cooperate in musical activities in a social setting. This in turn may help children to become more self-motivated and then to increase and sustain practice. However, more research is required to establish the exact mechanisms by which encouragement and support from parents and teachers facilitate and scaffold the acquisition of the necessary musical skills, and the exact ways in which interaction with peers help in the development of identity, skills and motivation.

### **Conclusions**

The findings suggest that it is possible to provide an account of the development of musical ability both in terms of the individual's development of skills and also in terms of social factors necessary for the development of success as an adult. While sheer amount of practice is necessary for achievement as a child, this alone does not explain musical

success as an adult nor, indeed, can accounts that concentrate purely on inherent, innate talents or traits. It seems that in order to develop a full account of musical development we need to explore the role that early mother-child interaction plays in developing an emotional relationship to music, and the role that the teacher's personality plays in encouraging learning and in providing sensitive scaffolding. However, these may not be the only factors in determining adult success. Along the lines of research in other areas of developmental psychology, there needs to be a greater recognition in music research of the complex influences of intra- and inter-group peer processes in shaping adolescents' motivation and personality and perhaps less emphasis on the role of parents and teachers during this transition into adulthood (Harris, 1995).

Table 5 lists the critical factors discussed above. It indicates those which appear to be necessary for the advancement through different periods of musical learning from initial learning through to adult success. The current paper reveals that adult musical success may be predicted by childhood measures. More research is needed, but in this paper we have presented for the first time a model that allows the assessment of the different role that environmental factors play in the development of sustained high-level musical participation across the transition from childhood to young adulthood.

**Table 5.** Summary of findings: factors necessary for achieving each level of success

	Initial years of playing	Later childhood years
Continuation of playing into childhood	Early start Parental support Teachers who are friendly	
Success as a child	All the above plus: High initial practice Teachers who are not too pushy Teachers very friendly	Continuation of high levels of practice into fourth year of playing Teacher not too relaxed
Success as a professional musician	All the above plus: Mothers at home	All of the above plus: More improvisation Gradual increase in practice rather than initial big burst (avoidance of burn-out) Involvement in concerts and group activities Later teachers who are more pushy

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