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Abstract

This article addresses individuals' decisions to continue or cease playing a musical instrument from a basic psychological needs perspective. Participants began learning music 10 years prior to the study and were the subject of previous longitudinal research. They completed a survey investigating the three psychological needs of competence, relatedness, and autonomy in the contexts of when they were most engaged in playing their instrument during high school, and in the time leading up to when they ceased playing. Decisions to cease music instruction or playing an instrument were associated with diminished feelings of competence, relatedness, and autonomy, compared to when they were most engaged. Open-ended responses to a question about why they ceased playing supported this finding and showed that participants refer to reasons directly related to feelings of psychological needs being thwarted. This article therefore proposes that motivations to cease or continue playing a musical instrument demonstrate a natural propensity to more vital, healthy forms of behaviour. The study offers preliminary evidence for a framework that may help to unify previous research in music and supports motivational research in other areas.

Keywords

competence, dropout, education, motivation, psychological needs, self-determination theory

Introduction

Factors that influence children's motivations to learn and play music are of great interest to music educators and debate among researchers. School curriculums in western societies aim to

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foster the ability to engage in active, ongoing, and rewarding participation in music activities through to adulthood (e.g., Board of Studies NSW, 2003), yet relatively few students elect music through to the end of high school (e.g., Board of Studies NSW, 2003). In adulthood, very few individuals reflect that they have experienced a music education that was personally satisfying to them, and many wish they had learned to play a musical instrument early in life (Crowther, 2007; Wilson, 2006). Parents often express a desire for their child to learn an instrument, yet ongoing commitment to music learning in childhood is difficult, and the processes that sustain motivation are poorly understood (McPherson & Davidson, 2006).

Previous research on “dropout”

Several studies have examined the characteristics of students who cease learning (or “drop out”), but few offer psychological or motivational explanations for the behaviour. Corenblum and Marshall (1998) found socioeconomic status (SES) to be an effective predictor of achievement (higher SES) and dropout (lower SES) in a high school band programme. They interpreted SES as a proxy variable for certain beliefs, values, and physical environment that are conducive to music learning. Similar SES trends were found by Klinedinst (1991), who also found links between retention in an instrumental music programme and scholastic ability, reading achievement, and mathematics achievement. The conclusions demonstrate links between these constructs and retention in music programmes, but they are limited to a particular type of school band programme, leaving few theoretical implications for other types of music education programmes and music behaviour more generally. In a study by Costa-Giomi, Flowers, and Sasaki (2005), behavioural differences were observed between beginning pianists who ceased learning within 3 years and those who continued. The pianists who ceased learning tended to seek approval from their teachers more frequently, accomplished fewer tasks, and received fewer actual approval comments from their teachers than those who continued learning. Hallam (1998) also found that students’ intentions and attitudes towards practice were predictive of dropout.

While these results may have useful predictive power for identifying students who are likely to cease music learning, they tell little about the underlying psychological mechanisms influencing the students’ motivations, and are related parochially to specific music learning contexts. Approval-seeking behaviour in the classical music studio environment of the Costa-Giomi et al. (2005) study, for example, may not be relevant to a school band environment; attitudes to practice in the Hallam (1998) study may not be as relevant for learners of instruments or musical styles in which informal learning and jamming are the norm. Without a theoretical framework to address underlying motivations for behaviour, researchers looking for reasons why individuals cease music learning are likely to continue to find significant results, but the generalizability of those results will be limited, and researchers will continue to be unable to explain the breadth of prior research findings in a unifying way.

A line of research that addresses these issues more theoretically, and that in our opinion expands on the simplistic explanation of a pure ‘innate talent’ approach (Howe, Davidson, & Sloboda, 1998), adopts an *environmental* perspective to explain why students engage in music activities and how they attain success. In extensive biographical research on experts in music and in other areas, distinct phases of learning have been identified (Bloom, 1985; Manturzewska, 1990; Sloboda & Howe, 1991; Sosniak, 1985). These phases seem to be characterized by qualitative differences in the social environment, such as relationships with parents, peers, and teachers, to accommodate the needs of each phase. In a landmark study, Ericsson, Krampe, and Tesch-Römer (1993) examined experts across a range of fields and identified the common

attainment of 10,000 hours of deliberate practice that they believe is a necessary condition for the development of expertise in a domain. However, these areas of research are limited in addressing the current motivation issues in two critical ways. First, whilst the researchers acknowledge the need for extensive motivational resources to negotiate the difficult transitions between each phase and to sustain extensive amounts of deliberate practice that is often difficult and lonely, the source of these motivational resources is not clear within this explanation. Second, the research focuses mainly on expert performance, which may represent qualitatively different motivational needs from normal populations, especially young developing musicians (McPherson & Zimmerman, 2002).

Background to the current research

Beginning in 1997, McPherson and Davidson headed a longitudinal study into children's music learning that involved 157 students in primary (elementary) school band programmes in Sydney, Australia (for reviews see McPherson & Davidson, 2006; McPherson, Davidson, & Faulkner, 2012). The findings shed light on a broad range of factors associated with the children's personal beliefs and values, their home environment, relationships with parents, peers, and teachers, and the strategies and techniques undertaken by the students to practice and perform on their instruments. Children's expectations about their learning certainly played a role in their achievement levels, with children who had a long-term commitment and realistic (rather than unattainably high) expectations about how much practice they should engage in achieving much higher on performance measures (McPherson, 2001). The students who ceased playing within nine months of learning undertook considerably less practice than those who continued (McPherson & Davidson, 2002). Cognitive strategy use was also found to be connected with achievement and continuing to learn, and in some respects was an even better predictor of success than total hours of accumulated practice time (McPherson, 2005). Children who use sophisticated strategies performed better than those who did not, and were more likely to sustain involvement with their instrument for a longer period of time.

Studies examining the home environment have made similar findings: children achieve more highly when they experience an unthreatening home environment where they can experiment and practice freely, study with teachers from whom they enjoy learning, and develop a sense of intrinsic motivation early in their learning (Davidson & Burland, 2006; Davidson, Howe, Moore, & Sloboda, 1996; McPherson & Davidson, 2002). These findings are close to empirically demonstrating links between an ideal social environment, the development of intrinsic motivation and cognitive strategy use, and ongoing participation in music activities. However, there is still no theoretical framework that explains why these links exist.

Over 10 years after the students in the project commenced learning, they were targeted again to participate in a follow-up project, which aimed to extend the findings of the initial project and to study more broadly the role of music in the lives of the participants. The study reported in this article forms a part of the follow-up project.

Theoretical framework

The concept of *psychological needs* was used as a theoretical framework for the present investigation. Given the range of factors cited in the literature above, we believe that a psychological needs perspective is a concise way to unify the findings and conclusions of social-cognitive

music education research, as well as to explain the findings of the current 10-year study. The particular approach used was the basic psychological needs theory of Ryan and Deci (2000). This theory proposes that humans are continually motivated to pursue activities that satisfy basic human needs, and move away from activities or situations in which they feel those needs are thwarted. It is a critical component of the broader self-determination theory, a metatheory comprising of psychological needs as a basic underlying premise alongside several other 'mini-theories' (Vansteenkiste, Niemiec, & Soenens, 2010). Proposing a basic set of psychological needs suggests an *organismic dialectic* perspective (Ryan & Deci, 2002), meaning that humans have evolved this motivation to guide them "toward more competent, vital, and socially integrated forms of behaviour" (Deci & Ryan, 2000, p. 252). The three psychological needs that frame the theoretical explanation are:

- *competence*, the need to feel effective in one's efforts and successful in the acquisition and execution of skills;
- *relatedness*, the need to feel socially connected and integrated; and
- *autonomy*, the need to feel that one's activities or pursuits are self-endorsed and self-governed. (Ryan & Deci, 2002)

This particular psychological needs approach is backed by empirical evidence (Sheldon, Elliot, Kim, & Kasser, 2001) and applied studies in a range of domains such as work, interpersonal relationships, and physical education (Deci et al., 2001; Patrick, Knee, Canevello, & Lonsbary, 2007; Sheldon, et al., 2001; Standage, Duda, & Ntoumanis, 2005).

Given the extensive empirical evidence for the theory, we saw the basic psychological needs as potential explanations for why individuals are motivated to continue or move away from music activities. Children's motivation for music learning has been previously addressed in the literature cited throughout this introduction, but our contention is that the psychological needs approach is potentially a unified way to conceptualize previous work and to explain some of the results obtained from our study of engagement in music activities over a 10-year period.

Purpose of the study

The current study aimed to evaluate the extent to which the psychological needs proposed by Ryan and Deci (2000) provide an explanation for why the children and adolescents in our study ceased or continued playing musical instruments. Statistical and qualitative data were used to examine the extent to which these types of data supported the hypothesis that greater levels of psychological needs satisfaction in music activities results in continuing motivation to play an instrument, and thwarting or inhibiting the psychological needs results in ceasing musical engagement.

Method

Participants

The target sample consisted of 157 individuals who participated in the research in 1997. The students were just commencing learning in primary (elementary) school band programmes from eight primary schools in Sydney, representing a range of socioeconomic populations. The students were from Years 3 and 4 in primary school (8–10 years old). There were 87 (55%)

Table 1. Participants from the first 5 years of the study

	Year 1		Year 2		Year 3		Year 5	
	N	%	N	%	N	%	N	%
Continued playing	131	84	109	69	107	68	65	41
Ceased playing	24	15	42	27	44	28	82	52
Left study	2	1	6	4	6	4	6	4

Note. "Ceased playing" means the students were no longer involved in their school band programme. "Left study" means the students no longer wished to be involved in the research.

females and 70 (45%) males. When the follow-up data were collected for the present study, the students had finished high school and they were 18–20 years old. In the "Child to Musician" project, the participants had been closely followed to find whether they were continuing to play their instruments 1, 2, 3, and 5 years after they began. After 5 years, 41% of the total original sample was still participating in a school band programme. Further details are shown in Table 1.

It is possible, with the results of the present study, to extend the table to 'Year 10' and indicate that 17 participants (16%) were still playing an instrument, 87 (84%) had ceased playing, and 53 (51%) did not respond to the survey so they had left the study. However, we believe that these figures have little meaning considering the rich variety of musical experiences that were described by the participants. For example, a participant may have ceased playing the instrument that he or she first started learning, then picked up another instrument with a serious level of commitment and passion. Yet in this table, such a student would be recognized as having 'ceased playing.' Similarly, a participant may have played his or her instrument until the end of high school—possibly for around 10 years—with high levels of engagement and success in many musical activities, and is now content to leave his or her instrument packed away, without regret. A music educator might regard this as a very successful case, yet it would also be reflected in the table as 'ceased playing.' We have therefore omitted this information from the table, and rather emphasize the nature of the psychological needs in music education and our contention that engagement and the decision to cease engagement in an activity is guided by the propensity to fulfil basic psychological needs and the overall tendency towards healthy, vital forms of behaviour. Though it might seem unusual to music educators, continued participation and engagement in music activities may not always represent such healthy or vital forms of behaviour (see "Discussion" later).

The participants were contacted for the current follow-up study using a range of methods including the most recent contact information (which was over 5 years old), social networking websites, phone directories, electoral roles (publicly available information about citizens who are enrolled to vote), and snowballing techniques such as asking friends who had studied at the same school. Eleven participants could not be contacted using these methods, and 43 were contacted but did not complete the online questionnaire. The current study elicited responses from 104 participants (58 female, 45 male, 1 did not specify sex). The response rate for the project was therefore approximately 66%. Using data from previous years of the study, we were able to compare the respondents of the current survey to the non-respondents based on several variables: music performance ability measures, reported average daily practice, autonomy as

measured by the participants' need for reminders to practice, and the length of time the participants thought they would continue playing an instrument. No significant differences could be found between respondents and non-respondents using parametric and non-parametric statistical analyses of these data.

Procedure

The main dataset comes from responses to an online questionnaire, a component of the first author's doctoral dissertation (Evans, 2009). After being contacted and asked if they would like to participate, the participants were sent an email with a link to the online questionnaire and a unique access code. Participants responded to the questionnaire between November 2007 and January 2008. The respondents were sent a gift certificate to the value of AUD\$20 as a token of appreciation for their participation in the project. For all phases of the projects described here, formal ethics approval was gained from the institutions employing the researchers at that time. For the initial studies that took place in 1997–2001, the procedures were approved by the University of New South Wales Human Research Ethics Committee. For the current data collection, the procedures were approved by the University of Western Australia Human Research Ethics Committee and the University of Illinois at Urbana-Champaign Institutional Review Board.

Measures

Of the total respondent pool for "Music in our Lives," 84 (87%) of the participants responded that they had ceased playing a musical instrument, and it is these responses that are used as the basis for analysis in the current study.

Psychological Needs Scale. The Basic Psychological Needs Scale (Gagné, 2003), designed to measure the fulfilment of the three basic psychological needs of competence, relatedness, and autonomy, was adapted for use in this music context. The items from the original scale were used as a guide for constructing items that related to music learning, as has been done in other applied areas such as work (Baard, Deci, & Ryan, 2004; Deci, et al., 2001) and interpersonal relationships (La Guardia, Ryan, Couchman, & Deci, 2000). The adapted version of the scale presented 22 statements, each associated with one of the psychological needs, to which participants respond on a 7-point scale from "not true" to "very true." Some of the statements are presented to correspond with the need being satisfied (e.g., "I was good at playing my instrument" to assess competence), while others were presented to correspond with the need being inhibited or thwarted (e.g., "I could rarely make my instrument sound good" to assess whether competence was being thwarted). The complete list of statements used for each psychological need are presented in Table 2.

The adapted psychological needs scales cited above arrive at the three factors of competence, relatedness, and autonomy by summing the positive items in each category, then subtracting the sum of the negative items. Instead, for this analysis, we preserved the positive and negative items as separate factors, as we were interested to see whether need fulfilment and need thwarting operated in different ways. The negative factors were labelled "incompetence," "unrelatedness," and "heteronomy." There was an uneven number of statements for each factor, so to ensure that each factor is measured on the same scale, the 7-point items were weighted so that the highest

Table 2. Items used for the adapted Psychological Needs Scale

Competence
<i>Positively scored items</i>
I was good at playing my instrument
I would play my favourite pieces for fun
I developed a sense of pride in my abilities
People told me I was good at music
I was getting better and better
<i>Negatively scored items</i>
I could not keep up with the other kids
I could rarely make my instrument sound good
I didn't feel like it was my thing
Relatedness
<i>Positively scored items</i>
I made new friends who did the same activities
I got along well with others who were involved
I really connected with my music teacher
It was a way I could be with friends
I had friends with similar interests
<i>Negatively scored items</i>
I felt out of place, like I didn't belong there
It took me away from spending time with friends
It often caused arguments or conflict with my family
Autonomy
<i>Positively scored items</i>
It was totally up to me whether to continue or not
I decided on my own what and how to practice
I could have stopped if I wanted to
<i>Negatively scored items</i>
I felt forced or pressured to learn music
I couldn't be bothered most of the time
My parents always reminded me to practice

possible score for each factor was 35. For example, the positive items for competence consist of five 7-point items so they are simply summed; but the negative items for competence consisted of only three items, so they were summed, then multiplied by 5/3. The 22 items within the scale were presented in an order determined randomly for each participant to eliminate any effects that the order of questions would have on the participants' responses. The participants would therefore not be aware of the groupings of the items into various factors.

The adapted Psychological Needs Scale was presented in two contexts. The first context, labelled "highly engaged" was about "music activities as an adolescent, both in school and outside of school . . . when you were most musically active"; the second, "ceased playing," referred to "the weeks and months leading up to when you quit playing your instrument." Comparisons between the two contexts were possible for 59 participants of the 87 used in the study (only 61 completed every item of the Psychological Needs Scale in each of the three contexts of primary school, high school, and when ceasing to play; two cases were excluded because their data were outliers).

Table 3. Repeated measures ANOVA with context (highly engaged, ceased playing) as the within-subjects factor and psychological needs as the dependent measures

Source	Measure	d.f.	<i>F</i>	η_p^2	<i>p</i>
Context	Competence	1	3.357	.055	.072
	Incompetence	1	4.057	.065	.049
	Relatedness	1	7.202	.110	.009
	Unrelatedness	1	10.022	.147	.002
	Autonomy	1	0.213	.004	.646
	Heteronomy	1	7.153	.110	.010
Error (Context)	Competence	58	(21.367)		
	Incompetence	58	(8.557)		
	Relatedness	58	(18.680)		
	Unrelatedness	58	(7.314)		
	Autonomy	58	(10.187)		
	Heteronomy	58	(7.966)		

Note: Values in parentheses represent mean square errors.

Reasons for ceasing musical engagement. Within the online questionnaire, participants were asked if they had ever ceased playing a musical instrument since they began learning in the primary school band programme, whether it was the instrument they played in primary school or another instrument they had learned to play since. Of the 87 who responded that they had ceased playing an instrument, 75 of these responded to the open-ended question, “describe briefly the reasons why you quit playing your instrument.” The text responses ranged from a few words (e.g., “no time,” “I got braces”) to several sentences with precise details about the reasons why the participant ceased playing. The median number of words used was 31. These short answers were studied to examine common themes, and to see whether references to the psychological needs constructs of competence, relatedness, and autonomy emerged.

Results

Quantitative psychological needs data

A repeated measures analysis of variance (ANOVA) was conducted with context (“highly engaged” and “ceased playing”) as the within-subjects factor and the psychological needs as the measures. There was a significant effect of context, Wilks’ Lambda = 0.756, $F(6, 53) = 2.855$, $p = .017$. Details for each psychological need are displayed in Table 3. The result for autonomy was not significant, $p = .646$, but the result for competence approached significance, $p = .072$, and other measures were significant, $p < .05$. Statistics for mean and standard error of each psychological need are displayed in Table 4. The effect of context accounted for 24.4% of the variance in the model.

Self-reported reasons for ceasing to play

The responses to the statement, “Describe briefly the reasons why you quit playing your instrument” were analysed to find the extent to which they aligned with constructs related to the

Table 4. Descriptive statistics for comparing psychological needs in each context

	Highly engaged		Ceased playing	
	M	SE	M	SE
Competence	23.271	0.872	21.712	0.807
Incompetence	8.509	0.512	9.593	0.527
Relatedness	21.254	0.906	19.119	0.929
Unrelatedness	7.085	0.494	8.661	0.549
Autonomy	16.898	0.558	16.627	0.462
Heteronomy	10.017	0.532	11.407	0.541

psychological needs of competence, relatedness, and autonomy. If the responses contained reasons that were related to the three needs, they were categorized as such. These three constructs are discussed in the following sections as themes that emerged from an analysis of the responses.

Competence. Many participants cited reasons related to competence for why they ceased playing their instrument. For some, it seemed that ceasing to play their instrument came about when they realized that they lacked musical abilities. They assigned a trait-like, internal nature to their abilities rather than external factors:

I have a sister who is extremely musical and was very into it and that made me realise I was not.

I love music but I did not feel as though I had the best skills to perform. I had a good friend who was amazing at the drum kit and I guess that made me feel ashamed of my ability.

For these two participants, important other people in their lives were the source for comparisons of their own abilities, and they seem to have found that their own abilities were qualitatively different from the “amazing” and “extremely musical” skills of their friends.

Several participants felt that when they transitioned to high school, their abilities exceeded that of their new peers:

The music was unchallenging, the band seemed lax and unfocused compared to my primary school experience, I had no opportunities to improve or make a significant contribution to the band.

When I joined the high school band, they were behind the level that I was at and I found it most boring and frustrating.

Relatedness. From the transition to high school through the selection of activities, school subjects, and peer groups, and the completion of high school, the dynamics of peer relationships play a dominant and influential role in the lives of adolescents (Steinberg & Morris, 2001). One expects to see this role demonstrated in young people’s descriptions of why they chose to continue or cease engagement in particular activities, and this was certainly evident in the participants’ cited reasons for why they ceased playing a musical instrument:

In primary school I thought it was ‘cool’ to be in the band because my friends were. In high school I thought it wasn’t so ‘cool’, and that at the time was very important.

I didn't enjoy the high school band, it took up too much personal time, and the people in the band were mostly geeky people I didn't like.

These participants both observed that their peer group membership was threatened by membership in the school band. It was important for the participant in the first example to maintain the status of "cool," and for the participant in the second example, to avoid the status of "geeky." Another participant described explicitly the effects that she remembered this having on her social experience:

I continued to play the clarinet in high school but felt it isolated me socially.

Peers, however, are not the only significant others: The teacher or band conductor seemed to be important in many of the participants' descriptions. Some participants described characteristics of the teacher or conductor as being an influence on their enjoyment of the music learning experience:

I have two older brothers and preferred to be doing activities outdoors to being cramped in a hall with the conductor getting angry at everyone because we aren't playing up to his their standard.

The conductor was pretty much a bastard and I just started to hate it so I stopped.

I was not enjoying the musical experience at my primary school, predominantly due to the band conductor.

And in some cases, the responses explicitly referred to the participant's relationship with their teacher:

My teacher and I didn't get along at all, I just stopped enjoying it. I still play a bit, but not properly.

I played my primary school instrument through high school and also took up another two instruments. I quit all at the same time at the end of year 10. I started a part time job, I was doing well at Tae Kwon Do, and didn't really have a lot of time on my hands. But most of all I didn't like my music teacher. That was my main motivation to quit music.

Autonomy. The construct of autonomy appeared to operate in many of the participants' responses, particularly with respect to the core themes of internal perceived locus of causality, volition and choice. The first of these was evident in the following response:

I didn't enjoy it. I found it boring and the reason I continued all the way through primary school was because my mum wanted me to. I didn't feel like it was something that was relevant or tied in to my life.

This participant had sustained involvement in the primary school band solely because someone else had wanted her to. The theme is also evident in the following response:

Lack of interest. I was mainly forced into keeping the instrument as long as I did. That combined with some interest, however it dwindled it my older teen years.

Perceived locus of causality is somewhat related to the dimension of volition, or feeling as though one is feely initiating and sustaining behaviour, rather than feeling forced or pressured.

In the following example, the participant uses such language and describes the dramatic consequences of the experience:

Unlike my primary school experience, my high school did little to involve me in bands, etc. However, I was made to learn an instrument for the first two years of high school. My skills deteriorated and the experience tore from me any love I had left for playing music.

The perception of choice is an important dimension of autonomy, and the following participants describe their experiences of an activity in which it seems that they were not playing the kind of music they might have been playing if they had the choice. The second example invokes both volition and choice:

I quit playing the clarinet as I was getting bored with playing 'school band' music and I felt that I was not really improving. I also needed more time to focus on my HSC.

I felt like I was forced to play it in the first place and then forced to practice music that was not of my choosing so I felt restricted and oppressed.

Many of the participants stated that they quit playing their instrument because they did not have enough time. Not having enough time for something is usually the first plausible reason why one does not participate in an activity, and indeed for many of the responses, the participants went into no further detail. Some, however, elaborated on the response and explained why, suggesting that not having enough time is related to autonomy:

I stopped playing my instrument because of not having enough time. I thought it took up too much time away from my school work and classes.

I was not as good as others and I found practicing and going to band and lessons to be a chore rather than enjoying them. I wanted to use my time for something else and knew I could save my parents a lot of money considering I didn't love playing my instrument the way others in the band did.

The first participant refers to music as an outside force or agent, exerting control: "it took time away" from doing other, more valued activities. The second compares music practice and lessons to chores—activities in which one typically does not experience volition and perception of choice, but which are perceived as necessary by an external locus of causality.

Interdependence of the psychological needs. By their nature, the three psychological needs are somewhat interrelated. Competence can play a role in determining one's status in a social group. Social endorsement may foster certain feelings of autonomy. And autonomy is required for self-regulatory behaviours that foster competence. These are just a few examples of ways in which the three psychological needs can be related.

Some of the most dramatic responses demonstrated that more than one psychological need had been thwarted. This participant, for example, listed reasons related to all three psychological needs:

I quit the trombone in year 8 (2002) because the music we were playing was not challenging and crap along with the fact 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.

This participant referred comprehensively to both self-referenced and socially referenced sense of competence, the importance of having social networks in the activity, and the absence of a sense of volition with respect to the music played in the band.

Additional practical and environmental limitations. Although not related to the psychological needs directly, we felt it necessary to include a section describing some of the practical and environmental reasons the participants cited for not participating in music activities. Many described practical aspects of the environment that are likely to have made it either impossible to continue pursuing the activity, or excessively difficult for the participant to pursue compared to their enjoyment or ability. A lack of motivation does not appear to be the primary reason for the participant ceasing in most of these responses:

High school started teaching from the recorder, then I ended up leaving high school for home schooling. I never tried to do music outside the school environment.

I had my instrument stolen in the last weeks of primary school, which became an excuse to quit when I got to high school.

I was forced to quit the French horn when I moved to a new school in Year 8, because they lacked the facilities and general interest in providing me with an instrument or tutor. Although I could have tried to continue learning it outside of school I was at an age when I wasn't passionate or diligent enough to do so. At that time I was more interested in pursuing my singing.

It was too expensive and inconvenient to continue considering the level of enthusiasm I had (low).

Similarly, we found four responses in total that cited orthodontic braces as a major impediment to them continuing to play a musical instrument:

Getting braces for my teeth coincided with my lessening interest and enjoyment of playing an instrument at high school. I did not enjoy playing an instrument near as much at high school as I did at primary school, and nor do I think I was as good.

In year 10 I got braces (on my teeth) and after continuing to play for a few months and using wax on my teeth I stopped because of the inconvenience. I couldn't play the higher notes or put as much pressure on my lips and it became frustrating. I got the braces off when I finished year 12 last year and haven't started playing because I've been doing a lot of other things at university. I have no specific plans to start again but it is in the back of my mind.

The second example shows a participant who appears to have been completely defeated despite attempts to continue to play. Another participant simply responded, "Braces." However, a more positive outcome is seen in the following example. The participant here was responding to the question about why she had ceased playing in error, which had the fortuitous outcome of informing us that braces had provided an obstacle to continuing, but he had the resources necessary to overcome the adversity and continue to play for at least several years:

Still play. Closest I came was when I had braces.

Discussion

Many studies have been conducted that attempt to explain the reasons why students cease music learning, but few acknowledge the theoretical structure of motivation or take into account basic human psychological functions such as the role of psychological needs. The study reported here involved a quantitative data analysis, the results of which indicated that participants felt greater feelings of fulfilment and fewer feelings of inhibition of psychological needs when highly engaged in music learning compared with when they ceased playing. Conversely, in the time leading up to when they finally made the decisions to cease music instruction, they felt greater feelings of needs inhibition and fewer feelings of need fulfilment. The quantitative results warrant some caution; limitations are discussed below. The study also examined responses to an open-ended question that asked participants to describe why they ceased learning an instrument. Though these responses were short, they contained insightful information that provided an additional level of depth relating to one or more of the psychological needs of competence, relatedness, and autonomy.

A limitation of the data may be the narrow range of music learning experiences demonstrated by the sample. The participants were young children who were all enrolled in a school music programme playing brass and woodwind instruments, so it would seem that further research is needed, particularly with children whose early learning experiences are in other types of music learning. However, we would speculate that similar results are likely to be found, because while the children's early experiences were similar, they pursued a broad range of music activities in high school, to the extent that no two participants' combinations of activities in high school were alike. In addition, the theoretical framework of basic psychological needs attempts to provide comprehensive explanations for human behaviour at a general level, and the theory has extensive empirical support from areas unrelated to music education, such as work, sports, and interpersonal relationships. We would be surprised by results that demonstrated that with different early music learning experiences, the psychological needs appeared to operate in a different way. Another limitation of the data is the limited length of the qualitative responses about why the participants ceased playing their instruments. This provides an obvious link to future qualitative research that could powerfully illuminate the experiences of children playing a musical instrument and provide much-needed further depth to the area.

In the quantitative data, the result for autonomy was not as clear as for the other needs categories. We see two plausible interpretations for this result. Much of younger adolescents' behaviour is guided and initiated by their parents, and it is not until later that individuals begin to gradually renegotiate relationships with their parents and seek to fulfil an increasing need for autonomy (Collins & Laursen, 2004). The initiation of music learning at age 8–10 was likely to be either caused by or accompanied by a significant amount of parent and or teacher encouragement, rather than the self-initiation and endorsement that characterize an act of autonomy. The other possible interpretation of the statistic is that it measured autonomy in relation to the weeks leading up to when they ceased learning. During this time, these individuals would be reflecting on the activity and developing a sense of control for whether they want to continue engaging in it. In other words, choosing to move away from the activity is itself an autonomous act, and the decision to cease learning, rather than the feelings of autonomy within the activity, may be represented in the data. More precise wordings of questionnaire items or detailed interview questions would be able to clarify this issue.

Retrospective data such as these, where participants are asked to consider music learning at two times in the past, raise two issues: demand effects, and the effects of hindsight. The 'demand effects'—where the participants' responses are influenced by what they perceived the research agenda to be—may have been mitigated somewhat (but not entirely) by the large number of other areas covered in the questionnaire about the role of music in the participants' lives more generally, and about other experiences, such as music learning in primary school. Such questions may have served as distractors from the participants trying to guess the aims of the research. In fact, the only explicit communication of the aims of the research to the participants was that we were trying to understand "the nature and importance of music in people's lives." The second issue—that of hindsight—questions the assumption that the Psychological Needs Scales are accurate gauges of the participants' feelings within various times and contexts in their lives. In an attempt to minimize the effect, we stated, "even though it was a long time ago, try to recall or estimate how you felt at the time." The limitations of such retrospective approaches is acknowledged, as is the need for further investigation in this area, including the use of other techniques that can validate the data reported here.

Implications for teachers

A good understanding of the process of motivation in children's music activities is vital for music teachers in sustaining quality music programmes. In Australia, participation in music classes beyond Year 8 is generally optional, along with many extra-curricular music activities such as orchestras, choirs, small ensembles, and popular music groups. In order to create and sustain a vibrant, active music programme within a high school, music teachers recognize the need to appeal to children early in high school. Often, towards the end of year 8, they engage in 'marketing campaigns' to make music seem more rewarding and to recruit students for elective music classes in year 9. Yet too often, such campaigns involve desperate measures: making music easy in order to seem more appealing; scheduling more interesting topics toward the end of year 8 when students are making choices and leaving the boring topics to other times; and bribing students with rewards of fun activities (e.g., playing guitars or keyboards informally) for completing tedious activities. A psychological needs approach regards these strategies as unhelpful. For example, some of the responses in our study for why participants ceased learning did indeed refer to being bored, but they usually referred also factors that operate at the core of the constructs of competence, relatedness, and autonomy, e.g., "[I ceased playing because of a] lack of interest. I was forced to play my instrument."

It appears therefore that according to self-determination theory, teachers would do well to ensure that their classrooms are providing the richly rewarding experiences of fulfilling basic psychological needs. Instead of trying to make music easy or fun, it would be worth spending time on ways to make lessons optimally challenging, creating interest and providing opportunities to acquire new skills, thereby facilitating feelings of competence. Social interactions were shown by the study to be critical, so teachers need to recognise the potential social consequences of participation in certain activities, and possibly provide an environment conducive to the establishment of rewarding peer relationships, thereby facilitating feelings of relatedness. Teachers should be aware of the students' peer culture within the school, which plays a strong role in adolescent behaviour, and is demonstrated in the results of this study by the comparatively high effect sizes associated with relatedness. Perhaps more than other areas of study or activity, music is inherently linked to adolescents' sense of social identity (DeNora,

2000; North & Hargreaves, 1999), so the type of music studied is one consideration that might bear upon students' sense of relatedness. Finally, teachers could provide situations in which students feel as though they have an input into the curriculum and activities, and ensure that they are warm and approachable, to promote students' feelings of autonomy. Teachers who use ill-conceived strategies such as contingent rewards or sub-optimal levels of challenge may in fact be subverting motivation, rather than enhancing it.

Although these are examples of teacher strategies for facilitating psychological needs in school music classrooms, the implications extend to studio teaching. Studio teachers play an important role in developing young musicians, and long-term activity requires forging a close relationship in which to develop competence, which is not always easy (Davidson, Moore, Sloboda, & Howe, 1998). Typical studio teaching strategies often involve prescribing extensive playing of scales without a rationale, placing an overemphasis on graded examinations, and focusing on repertoire completely determined by the teacher (Renwick & McPherson, 2002). These strategies may thwart the psychological needs and make it difficult to maintain motivation and engagement in learning the instrument.

Since a major part of the child's social environment is the home, parents have a substantial influence in their child's music education. Providing a home environment rich with musical stimuli and opportunities to feel competent, autonomous, and related with respect to music activities is likely to be an effective way to promote motivation for learning a musical instrument (McPherson & Davidson, 2006). Relationships between students, parents, and teachers have indeed been associated with better music education outcomes for students learning in studio environments (Creech & Hallam, 2003; Davidson, et al., 1996; McPherson, 2009).

Music participation and well-being

Perhaps the biggest implication of this research for music educators and parents is to challenge and rethink the assumption that any kind of music participation is necessarily good for the child. The results of this study suggest that for some participants, their music activities had the effect of thwarting their satisfaction of basic psychological needs. With this finding, we do not wish to suggest that music itself could be a cause for thwarting needs; rather, that music activities are diverse, and participation in a given activity may not *necessarily* contribute to fulfilling basic needs. Consider the example of a child early in high school who is socially alienated by his peers because he plays in the school wind band. In this case, the child's needs for relatedness are being thwarted, particularly if he is unable to integrate into the social environment provided by the school wind band. This would be exacerbated if the child were being forced by his parents to play in the band, in which case his need for autonomy would also be thwarted. In this case, not only does the child simply not want to play in the school band, but the activity also has social consequences that are dire at this time in adolescent development where social integration and group membership are so important. This example is an exaggeration to make a point, but in the present study there were many examples of psychological needs thwarting in the text responses outlined in the self-reported reasons for ceasing to play.

Previous research in music education motivation has used the words 'dropout' (Corenblum & Marshall, 1998; Costa-Giomi, 2004; Costa-Giomi, et al., 2005; Hallam, 1998) and 'failure' (Asmus, 1986; Austin & Vispoel, 1998), demonstrating the assumption of ceasing

music education as an undesirable outcome. Indeed, as researchers, we are often approached by parents who ask what is the best way to help their child to continue playing a musical instrument and taking lessons, even though they may not enjoy it. Parents often express a desire for their child to learn a musical instrument, most likely because they believe that musical abilities will be rewarding and valuable for the child as he or she grows through adolescence and into adulthood. They may also have other motives: perhaps the parent wishes that they had persisted with learning a musical instrument as a child (Wilson, 2006), or worse, perhaps they have a perceived lack of talent and are attempting to live vicariously through their child from an early age (Parncutt, 2006).

The findings from this study show that some students engaged in music activities had strong feelings of needs inhibition—feelings of incompetence, undesirable social outcomes, and pressure—that outweighed fulfilling experiences of competence, relatedness, and autonomy. The organismic dialectic approach assumed by self-determination theory posits that individuals tend towards growth and vitality (Ryan & Deci, 2002), so forcing individuals into situations where their psychological needs are thwarted is creating an environment where essential nutrients for well-being are scarce. The consequences of this can range from behaviour exhibiting materialism and ego-involvements, to ill-being and psychopathology (Ryan & Deci, 2000).

There is an obvious and perhaps necessary tension between the parents' desires for what is best for the child and the child's immediate, short-sighted feelings associated with the experience. Parents may believe, for example, that once the child persists for a few years, he or she may eventually acquire a level of skill that provides them with the feelings of reward as well as social endorsement that motivates them to then continue in the long-term, and there may be some truth to this (McPherson, 2001; McPherson & Davidson, 2002). A full discussion of parenting practices and their effects on children's music participation is beyond the scope of this article (c.f., Creech & Hallam, 2003; McPherson, 2009; McPherson & Davidson, 2002); However, given the potential consequences of inhibiting psychological needs, there appears to be a need for a more sophisticated understanding of what it means for a child to participate in music learning, and to contextualize that within the child's overall psychological well-being.

Implications for future research

Since this research was carried out, substantial discussion and work has been conducted by researchers on the measurement of the psychological needs at a general level (rather than in specific contexts such as work, sports, or as in this case, music). One problem with measuring the needs is that they are strongly interdependent (Deci & Ryan, 2000) and therefore highly correlated. For example, the item "It took me away from spending time with my friends" is a relatedness-inhibiting item, but it could also be interpreted as an autonomy-inhibiting item, with the attribution of control over the individual's time management to an external locus. "I could not keep up with the other kids" is a competence-fulfilling item, but it has obvious connections to relatedness. This interrelatedness was evident in this study through the participants' self-reported reasons for ceasing to play (see "Results" earlier). Statistically, this results in high correlations between the items and factors, making factor analysis difficult even though the items may have substantial validity in representing the latent variables (Ryan, 2011). Johnston and Finney (2010) attempted to overcome this limitation by focusing on confirmatory factor analysis as a means to obtain a clear linear structure; however a clear factor solution could not be obtained, and the final solution does not contain any autonomy-inhibiting items, thus missing this important aspect of dimensionality and reaching an unhappy compromise between

internal and external validity. Sheldon and Hilpert (in preparation) meanwhile overcame this by devising items with meaningful levels of validity, for both positive and negative aspects of the psychological needs, and were able to provide a meaningful factor solution that separated the three needs. Their scale may be an important source for future work on measurement of the psychological needs in music.

Our next step from this work will be to examine links with the crucial role that beliefs and values play in achievement-related behaviour. A consistently strong finding from Eccles et al.'s (Eccles, 2005) extensive research on subjective task value shows that children are able to make reliable judgements about how they perceive an activity to be useful, interesting, important, and enjoyable, and that these values are strongly predictive of their behaviour. One gap in this model, however, is the role that experience plays in the formation of these beliefs and values. We see a link between the experiences of fulfilling basic psychological needs and the formation of beliefs and values. Preliminary work has uncovered an association between these two variables, suggesting that values are formed early in music learning as a result of the fulfilment of basic psychological needs, and that these values are then expressed in adult life through beliefs about the nature and value of musical abilities and music learning (Evans, 2009). This connection warrants further work and more research in the area would contribute to a fuller and more sophisticated understanding of the value and meaning of music activities for children.

Conclusion

The study aimed to provide a preliminary investigation of the framework of psychological needs—a robust theory with extensive empirical evidence in other domains—to music learning. The results indicated evidence supporting the hypothesis that continued participation in active music making was associated with the satisfaction of basic psychological needs, while the decision to cease music learning was made within the context of needs being thwarted. Limitations of the data, such as the retrospective report methodology, and internal validity of the scale, suggest that some caution is necessary in the interpretation of these results, and warrant further investigation in the area.

The findings have clear potential for music teachers and parents seeking to understand why students cease learning in a band programme, elective music class, instrumental tuition or other musical activity. The psychological needs framework offers a range of possible reasons that are more closely linked to core aspects of human functioning than previous research has offered. We look forward to further investigation in the area to confirm our findings and show that when music activities provide the deeply satisfying experiences of competence, relatedness, and autonomy, student motivation will be guided towards these enriching forms of behaviour.

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