Mindset and music: Developing the musical self-theories and goals questionnaire

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Theories of intelligence and academic performance

Despite theories of intelligence being uncorrelated with general cognitive ability (Dweck et al., 1995), (Robins and Pals, 2002), theories of intelligence do appear to reliably predict academic performance in students, especially when the learning environment is a challenging one (Henderson and Dweck, 1990), (Dweck and Sorich, 1999), (Robins and Pals, 2002). One important contributing factor to this is how children respond to failure. Some adolescents attribute their failures to a lack of ability, and therefore view the difficulty as insurmountable. In order to avoid further failure, they stop investing effort in the task. Diener and Dweck (Diener and Dweck, 1980) termed this reaction the *helpless* response pattern. In contrast, some adolescents exhibit a *mastery-oriented* pattern (Diener and Dweck, 1980), where they see failure as a challenge to be overcome by hard work.
The causes of these different behaviour patterns in response to failure are assumed to be rooted in the students' *theories of intelligence (Hong et al., 1999)*. Students who believe that intelligence is malleable (*incremental theorists*, *those with a 'growth mindset')* are more likely to attribute poor performance to effort rather than ability, and are more likely to take remedial action to improve their performance as a result (Hong et al., 1999). They enter academic situations with *learning goals*, meaning that they prioritise their own intellectual development over how intelligent they appear to others (Elliott and Dweck, 1988) (Robins and Pals, 2002). Incremental theorists therefore tend to be mastery-oriented.

In contrast, students who believe that intelligence is fixed (*entity theorists, those with a 'fixed mindset'*) are more likely to attribute poor performance to a lack of ability, and are less likely to respond to poor performance by increasing effort (Hong et al., 1999). They enter academic situations with *performance goals*, prioritising positive assessments over learning and avoiding challenging situations where their ability might be tested (Elliott and Dweck, 1988); (Robins and Pals, 2002). When they do meet with failure, it has a strong negative effect on their academic self-concept. Possessing an entity theory of intelligence therefore leads to helpless behaviour.

Theories of intelligence and musical talent

The relationships between students' academic development, their motivational patterns and their theories of intelligence are well understood. Less explored, however, is the way in which these relationships might extend to musical development. Learning to play a musical instrument is a challenging task that relies heavily on the student's autonomous motivation; mastery-oriented behaviour may therefore be particularly important for successful musical development. If academic mastery-oriented behaviour is fostered by an incremental theory of intelligence, it may be that in an analogous fashion, musical mastery-oriented behaviour may be fostered by an incremental theory, or 'growth mindset', of musical ability.

We are currently undertaking a longitudinal study (Müllensiefen et al., 2015) that aims to investigate to what degree beliefs about the nature of intelligence and about the nature of musical ability are related to each other, and how both of these beliefs might be connected to academic and musical development and performance. This article introduces two short self-report measures, termed 'Academic Self-Theories and Goals' and 'Musical Self-Theories and Goals', closely modelled on validated measures for self-theories in academic scenarios, which we developed for use in the study.

Academic self-theories and goals

The *Academic Self-Theories and Goals* questionnaire is produced by combining two short scales from Dweck (Dweck, 2000): the *Implicit Theories of Intelligence Scale for Children – Self Form* (short version) and the *Goal Choice* scale. Both scales have received experimental validation by a number of studies e.g. (Dweck et al., 1995); (Dweck, 2000). As explained above, they measure the degree to which an individual believes that intelligence is fixed and unchangeable (*entity theory of intelligence*) or can be improved through hard work (*incremental theory of intelligence*). The Goal Choice scale measures the desire to succeed at tasks and demonstrate one's own ability (*performance goals*) and the desire to improve one's ability through taking on challenging tasks (*learning goals)*. Motivation to work hard at school derives significantly from both of these types of goals in most individuals (Dweck, 2000).

The questions from the two scales are interleaved (see Table 1 for the complete question set). For six of the questions, participants respond on a six-point Likert scale; for the seventh question, the response option is binary. The two scales are scored independently, so each participant receives a *Theory of Intelligence* score and a *Goal Choice* score. High *Theory of Intelligence* scores (4–7) correspond to an entity theory of intelligence, while low scores (1–3) correspond to an incremental theory of intelligence; high *Goal Choice* scores (4–7) correspond to performance-goal orientation, whereas low *Goal Choice* scores (1–3) correspond to learning-goal orientation.

TABLE 1: THE *ACADEMIC SELF-THEORIES AND GOALS* QUESTIONNAIRE

No.	Question	Scale	Response options	Scoring
1	You have a certain amount of intelligence, and you really can't do much to change it.	*Theory of Intelligence*	6-level Likert item, agreement/ disagreement	Positive
2	If I knew I wasn't going to do well at a task, I probably wouldn't do it even if I might learn a lot from it.	*Academic Goals*	6-level Likert item, agreement/ disagreement	Positive
3	Your intelligence is something about you that you can't change very much.	*Theory of Intelligence*	6-level Likert item, agreement/ disagreement	Positive
4	Although I hate to admit it, I sometimes would rather do well in a class than learn a lot.	*Academic Goals*	6-level Likert item, agreement/ disagreement	Positive
5	It's much more important for me to learn things in my class than it is to get the best grades.	*Academic Goals*	6-level Likert item, agreement/ disagreement	Negative
6	You can learn new things, but you can't really change your basic intelligence.	*Theory of Intelligence*	6-level Likert item, agreement/ disagreement	Positive
7	If I had to choose between getting a good grade and being challenged in class, I would choose…	*Academic Goals*	Binary choice	

Musical self-theories and goals

The *Musical Self-Theories and Goals* questionnaire, meanwhile, is the prototype for a new scale that assesses the participants' attitudes to the development of musical ability. Given that academic development is demonstrably influenced by students' theories of intelligence and their goal orientation (Dweck, 2000), the *Musical Self-Theories and Goals* questionnaire is constructed to assess two hypothetical analogous attitudes towards the development of musical ability.

Firstly, the *Theory of Musical Ability* scale measures the belief that musical ability is fixed and unchangeable; this belief is termed an *entity theory of musical ability*. Alternatively, one might believe that musical ability can be significantly improved through hard work; this belief is termed an *incremental theory of musical ability*. Secondly, the *Musical Goals* scale measures the degree to which musical engagement is motivated by the two following goals: the desire to succeed at tasks and demonstrate one's own ability (*performance goals*) and the desire to improve one's ability through taking on challenging tasks (*learning goals*). Because the *Musical Self-Theories and Goals* questionnaire is intended to measure hypothetical constructs that are very similar to those measured by the *Academic Self-Theories and Goals* questionnaire, its questions are modelled closely on those of the latter, with academic terms being substituted for musical terms. However, this substitution process was not entirely trivial. In the case of assessing an individual's *theory of intelligence*, the term 'intelligence' is widely understood by adults and young children as denoting an individual's cognitive abilities, but it is a term that bears little presumption about whether these cognitive abilities are innate or learned. Finding an analogous and well-understood term for the musical domain is more difficult.

'Musical talent' is a well-understood term, but it implies a musical capacity that is innate, and likewise, 'musical ability' is well-understood, but it implies an acquired musical capacity (Boyle and Radocy, 1987). Instead of relying on one particular term to denote musical capacities, therefore, the *Musical Self-Theories and Goals* questionnaire makes use of a variety of idiomatic terms that ought to be well-understood by children and adults.

Likewise, constructing a *Musical Goals* scale on the basis of the *Academic Goals* scale required a few changes to account for the different types of goals involved in musical and academic study. Unlike in the academic sphere, where performing well in exams is not necessarily the same as possessing a high academic ability, performing music well is arguably the definition of being a good musician. In the *Musical Self-Theories and Goals* questionnaire, therefore, the *Goal Choice* scale focuses less on musical performance itself and more on how the individual's musical abilities are recognised by others. The scale items can be found in Table 2.

The *Musical Self-Theories and Goals* questionnaire is scored similarly to the *Academic Self-Theories and Goals* questionnaire: each participant receives a *Theory of Musical Ability* score and a *Goal Choice* score. These scores are arrived at by reversing negative items and averaging individual item scores. Analogously to the *Academic Self-Theories and Goals* questionnaire, high *Theory of Musical Ability* scores (4–7) correspond to an entity theory of musical ability, while low scores (1–3) correspond to an incremental theory of musical ability; high *Goal Choice* scores (4–7) correspond to performance-goal orientation, whereas low *Goal Choice* scores (1–3) correspond to learning-goal orientation.

TABLE 2: THE *MUSICAL SELF-THEORIES AND GOALS* QUESTIONNAIRE

No.	Question	Scale	Response options	Scoring
1	You have a certain amount of musicality and you really can't do much to change it.	*Theory of Musical Ability*	6-level Likert item, agreement/ disagreement; NA option	Positive
2	If I knew I wasn't going to do well at a musical activity, I probably wouldn't do it even if I might learn a lot from it.	*Goal Choice*	6-level Likert item, agreement/ disagreement; NA option	Positive
3	People are born with very different amounts of musical talent, and practice does little to change that.	*Theory of Musical Ability*	6-level Likert item, agreement/ disagreement; NA option	Positive
4	Although I hate to admit it, I sometimes would rather do well in music exams than get better at music itself.	*Goal Choice*	6-level Likert item, agreement/ disagreement; NA option	Positive

5	It's much more important for me to develop my musical skills than to get recognised for my musical skills.	*Goal Choice*	6-level Likert item, agreement/ disagreement; NA option	Negative
6	Musical success depends more on your innate talents than on how much practice you do.	*Theory of Musical Ability*	6-level Likert item, agreement/ disagreement; NA option	Positive
7	If I had to choose between performing easy music that I know I can do well or performing music that challenges me, I would choose…	*Goal Choice*	Binary choice; no NA option	

Future direction

The longitudinal study will take repeated measurements of cognitive, social and musical abilities, as well as academic performance, on the same secondary school children over five years, enabling us to explore the co-development of musical competencies, intelligence, social skills, self-concepts and beliefs. The research study, as well as any potential interventions that deliberately intend to change musical self-theories, will seek to broaden our understanding of the nature and development of personality and musical abilities through adolescence and how these relate to academic motivation, effort and achievement.

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