

The relationship between approach to learning and learning strategies in learning music.

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Introduction

As a cognitive activity, there is little doubt that learning music has many similarities to learning textual material. Both activities are complex, and both, particularly in non-trivial academic settings, are highly strategic and inherently metacognitive (Garner, 1987; 1990). Moreover, learning music is no more defined by technical proficiency than is reading defined by decoding proficiency (Kirby, 1988; 1991). In both media, successful learning implicates much higher-order processing (Resnick, 1990) involving the generation of sometimes quite abstract levels of understanding and application; understandings that may go well beyond the literal reproduction of the notation or text under consideration (Kirby & Cantwell, 1985).

As problem-solving activities, the processes of text comprehension and musical comprehension are both complex and ill-structured. The notion of ill-structuredness

implies that the identification of both the nature of the problem and the potential solutions requires more than the application of routine algorithms (e.g. Schoenfield, 1987). That is, as a number of cognitive theorists have suggested (Prawat, 1989; Salomon & Globerson, 1987), unravelling highly complex and ill-structured information, whether it be text or musical score, requires in the first instance, a conception of learning that embraces reflective or "mindful" planning and processing; in the second instance, a knowledge base of sufficient abstraction to provide a framework for interpreting complex data, and in the third instance, the availability and accessibility of appropriate problem-solving strategies.

In the present study we aim to investigate the relationship between measures of "mindfulness" in approach to learning, strategic behaviours, and the approaches taken by technically competent music students to the learning of novel music. We assume from the outset that the underlying musical knowledge base for the subjects in our study is equivalent in terms of exposure to music and base-level competency. All subjects have achieved a minimum of a Grade 2 level of musicianship. Our focus, rather, is on higher-level attributes of learning music. We are interested in examining individual differences in how technically proficient musicians approach the problem of learning new music, and the extent to which any differences in the approach to learning music also reflect differences in the underlying strategic behaviours.

"Mindfulness" in learning has been described by Salomon and Globerson (1987) as a mode of task engagement which reflects a purposeful, effortful, and consciously self-regulatory conception of learning. One dimension of mindfulness refers to the conceptions learners' hold of the nature and goals of learning, and of how these may be operationalised in strategic decision-making (Cantwell, 1992). Questions of individual differences in how and why individuals engage in learning have been addressed in what has been termed the "approaches to learning" literature

(Biggs, 1987a; Entwistle & Ramsden, 1983; Marton & Saljo, 1976; Schmeck, Geisler-Brenstein & Cercy, 1991). This literature has identified, amongst other dimensions of learning, two essentially orthogonal orientations to the way individuals approach the problem of learning. Individuals displaying a commitment to higher-level understandings of material to be learned, and who see learning as a process of integrating old and new information to a point of personalised understanding, have been characterised in this literature as "deep" learners. Deep learners are conventionally described as exhibiting high levels of intrinsic motivation coupled with the utilisation of a sufficiently broad strategic repertoire to enable the motivational goals of learning to be achieved. The second orientation reflects the attributes of Salomon and Globerson's (1987) "mindless" engagement in learning: the less effortful and less purposeful application of routine procedures across all domains of learning. In the approaches to learning literature, this orientation is exemplified by the "surface" learner. Such learners are conventionally described as displaying a lack of commitment to personalised understanding, conceiving of the goals of learning primarily in terms of the ability to rote reproduce data under consideration.

A number of studies have demonstrated qualitative differences in learning outcomes associated with deep and surface approaches. In Marton and Saljo's (1976) seminal study, university undergraduates were asked to learn a sample of complex text. Two methods of learning were observed. Subjects who focused on the literal meanings of the text tended to recall isolated details of the text, while those focussing on what they perceived to be the author's intentions tended to recall the more substantive argument of the text. Marton and Saljo (1976) characterised the former approach as "surface", indicating a disposition to not go beyond the surface features of the material to be learned. The latter group were characterised

as

"deep", indicating a disposition towards understanding deeper levels of meaning.

Biggs (1979), utilising a psychometric approach to the measurement of approach to

learning, found subjects reporting affiliation with a deep approach to be similarly

more likely to address deeper meanings of the material to be learned, while those

affiliated with a surface approach tended also to focus on surface-level material.

Similar results have also been reported by Cantwell and Biggs (1988); Meyer and

Dunne (1991); Schmeck and Phillips (1983), and Van Rossum and Schenk (1984).

The association of each approach to learning with qualitatively different outcomes

suggests that at the process level, fundamentally different ways of dealing with the

material to be learned may be observed. The results of both Marton and Saljo

(1976) and Biggs (1979) implicate differences occurring in two dimensions of

learning: in the depth with which content is treated, and in the range of strategic

behaviours necessarily brought to the task of dealing with multiple levels of content

concern (Cantwell & Biggs, 1988). Recent text processing research has highlighted the complexity of processing operations associated with dealing

with complex and

potentially quite abstract academic learning (Kirby & Cantwell, 1985).

Kirby (1988;

1989; 1991) has described a multi-level model of processing concerns associated

with learning from textual materials. Kirby suggests that at each of eight potential

levels of attention in text processing (see Figure 1), separate and additive

processing operations are brought to bear on the task of decoding and comprehending. These concerns range from normally automatic processes

focusing

on decoding operations (those dealing with feature analysis, letter and syllable

identification, through to word and word group identification) to less automatic

processes focussing on comprehension operations (generating understandings of

textual ideas, main ideas and themes).

Evidence suggests that the attentional focus of individuals in text processing may relate to two factors. For individuals lacking automaticity at the lower levels of processing (decoding), comprehension outcomes are limited to at best isolated units of meaning, generally not more than at the level of individual detail (Kirby & Cantwell, 1985; Kirby & Teasedale, 1988; Cantwell & Biggs, 1988). On the other hand, for those individuals who have attained automaticity at the lower levels, attentional focus is able to be located at the higher levels of meaning (Kirby & Cantwell, 1985; Cantwell & Biggs, 1988). For technically competent readers (ie. those with automatic decoding abilities) what determines individual differences in the level of focus in processing text may relate to more distal factors such as the individual's approach to learning than to more immediate features of the text itself. Existing research does indicate that individuals reporting a deep approach to

learning are more likely to focus at the higher levels of meaning such as main ideas and themes, while those reporting a surface approach are more likely to focus at the lower, detailed levels of meaning (Biggs, 1988; Cantwell & Biggs, 1988; Kirby & Pedwell, 1991).

In the present study, we speculate that parallels may well be drawn between the kinds of processing operations described in terms of text processing, and the kinds of processing operations required to learn music to a performance level (see Figure 1). We hypothesise that Kirby's (1991) operational levels in text processing may provide a framework for describing operational levels in processing musical score, and form a basis for differentiating at both the conceptual and strategic level, any differences in the way deep and surface learners approach the task of learning music. A description of the hypothesised equivalent levels follows:

1. Features: At the base level of all written communication are the markings that form the basis of all notation and letters. In reading both music and text, feature analysis implies awareness of the lines and curves which constitute letters and musical symbols and notes as being systematic and meaningful.

2. Letters / Musical Notes & Signs: Consistent interpretation of features allows an individual to attend to basic symbol units of the medium. In text processing, this involves letter recognition. In musical score, this includes recognition of individual notes, clef signs, time signature, dynamic markings, sharps, flats and so forth.

3. Syllables / Intervals: In text processing, attentional focus at the level of syllables involves explicit use of phonological or "sounding out" strategies as the basis of word identification. This involves recognition of the systematic relationship between individual letters within a word; a structural analysis of the individual word. In musical terms, such structural analysis involves recognition of the systematic relationship between adjoining notes (intervals).

INSERT FIGURE 1 ABOUT HERE

4. Words / Clusters: Access to words in text is enabled by the selective use of either visual strategies (scanning of configuration) or phonological strategies as direct and indirect means of moving from letter recognition to word recognition. Musically, the transition from individual notes to note clusters may also occur via these dual paths: by structural analysis of the component intervals, or by visual scanning of the whole note cluster. A cluster is a short musical idea (eg. chord, scale run) and thus represents the first true level of musical meaning. However, like individual words, the meanings attached to individual clusters are decontextualised and isolated.

5. Word Groups / Motifs or Note Grouplets Processing text at this level involves the "chunking" of groups of words into individual phrases and clauses. Efficient processing of word groups involves the use of both syntactic information

(including individual word function as well as the identification of chunk boundaries) and semantic information, in the form of assigning meaning to the particular chunk under consideration. In musical terms, combination of clusters forms a motif or note grouplet, a level of musical meaning equivalent to understanding individual phrases and clauses in text. These may vary in length according to the musical

function. In the case of Score 3 in the present study (see Table 2), for example, the first line consists of three motifs: an initial motif extending to the middle of the second bar, a second motif extending to the end of the third bar, and a third motif extending to the end of the fifth bar.

6. Ideas / Musical Phrase or Figure: An individual idea in text is constructed from a sequence of word groups, although on occasions a single chunk may contain a complete idea. Ideas are not always literal replicas of the text itself: it is often the case that additional information needs to be inferred from the text, such as perceiving unusual word choice, inferring relationships implied by particular conjunctives, and so forth. In musical scores, an individual idea is expressed in a by combining motifs into a musical phrase. In the case of Score 3, the initial musical phrase consists of a "sentence" of two "clauses" (motifs 1 and 3) plus a "conjunction" (motif 2). In the rhetoric of music, the phrase is quite complex, involving both the asking and answering of a musical question.

7. Main Idea / Musical Idea: The combination of musical phrases yields a musical idea, equivalent in text processing terms to the construction of a main idea from a paragraph. Main ideas are conventionally associated with summaries or gist statements about a text. Processing at this level involves the ability to segment the text into integrated sections corresponding to a sequence of major points. Main ideas are often signalled by structural features such as the use of topic

sentences. In poetry, for example, other devices such as alliteration often signal the cohesiveness of a set of individual ideas. In Score 3, the first musical idea consists of three phrases. In this instance, the phrases within the musical idea are linked by a parallel form of the cohesive device of alliteration: the initial cluster within the second and third phrases are identical.

8. Themes / Musical Subject: Themes in text processing represent highly abstract conceptualisations of the underlying message or argument of a text. Thematic processing provides the means of integrating all lower levels of information into a coherent representation of text meaning (Kirby & Cantwell, 1985). In musical terms, understanding of the musical subject involves the musician imposing a sense of musicality onto the score: that the component musical phrases and subjects are taken beyond technical proficiency to include variations of sound, mood, dynamic and so forth to ensure that the composer's message is projected, or to allow for individualised interpretation of the score.

In summary, the aims of the present study are two fold: to assess the relationship between students' reported approaches to learning and the manner in which students approach the problem of learning new music to the level of performance competence; and to assess the relationship between the level of processing concern in learning music and the breadth and depth of strategic behaviours reported by students.

Method

Subjects

A pool of thirty eighth-grade elective music students completed Biggs' (1987b) Learning Process Questionnaire. Group mean for the surface approach was 37.73 (sd

= 5.91, range 22 to 55). The group mean fell within the 5th decile range of Biggs' (1987b) norms for Age 14 females for the surface approach. Group mean for

the deep approach was 36.70 (sd 6.64, range 24 to 58). The group mean for the deep approach fell midway between the 5th and 6th decile ranges for Age 14 females.

Six subjects for the study were selected from within this pool on the basis of the extremity of their scores for the deep and surface approaches (see Table 1). All subjects were female, aged 14, able to read and play music at second grade level or higher. For comparative purposes, students' placement into streamed core mathematics and science classes is included. The third core class, English, was unstreamed.

INSERT TABLE 1 ABOUT HERE

Materials

Learning Process Questionnaire

The Learning Process Questionnaire (LPQ) (Biggs, 1987b) is a 36-item self-report questionnaire requiring subjects to indicate, on a Likert scale of 1 to 5, their strength of agreement with statements about how they approach various aspects of learning and studying. The responses may be summed to yield three scale scores: a Deep Approach score, a Surface Approach score and an Achieving Approach score. For the purpose of this study, only Deep and Surface Approach scores were used. Each scale score consists of a composite of six items relating to motives for learning, and six items relating to the associated learning strategies presumed to stem from these motives. Subjects' approach scale scores are calculated by summing the scores for the related motivational and strategic sub-scales. The maximum possible score for each scale is thus 60. Biggs (1987a) reports acceptably high reliability levels for each of the approach scales (alpha coefficients of .73 for the surface approach and .81 for the deep approach).

Musical Scores

The three musical performance tasks were designed by the second author with the assistance of two university music lecturers and the school music teacher (see Table 2). The tasks corresponded to the current level of student competency and

knowledge. Both lecturers and teacher confirmed the face validity of the musical scores for the target population.

Two versions of each score were prepared (treble and bass) to account for differences in instrumentation. Scores marked (a) were written in the treble for instruments such as flute and violin which are customarily written in the treble clef. Scores marked (b) are written in the bass for instruments such as trombone and double bass, which are customarily written in the bass clef.

INSERT TABLE 2 ABOUT HERE

Score 1: A simple rhythmic structure consisting of crotchets and semi-breves. Both the melody and rhythm are highly repetitive. The piece is eight bars in length (two equal phrases) and is to be performed at a slow tempo. Only a dynamic direction is given and the time signature is in common time. The pitch range is very

narrow consisting solely of the notes B, A and G. Although the key is G major, no accidentals are present.

Score 2: A more complex rhythmic structure than that of Score 1, as quavers and dotted minims are introduced. The key is D major and accidentals are present. Dynamic markings include loud and soft sections as well as a decrescendo, while the tempo is moderate with a ritardando. Other symbols include articulation markings such as tenuti, staccati and slurs. The compass spans a whole octave and is well within reach of most melodic instruments. The time signature has advanced to simple triple meter. The composition is 16 bars in length (four equal phrases), and is less repetitive and more melodically interesting than Score 1.

Score 3: Atonal in nature, this piece displays unusual intervals and unexpected accidentals, and is avant garde in style. The time signature frequently shifts between 2/4, 3/4 and 4/4 and there are many opportunities for rubato playing. More

difficult rhythms than those in Scores 1 and 2 are included, such as dotted notes, semi-quavers and various types of rests. The score is 24 bars in length and follows no set form. The prescribed tempo is lively and markings for articulation and dynamics are minimal. All of these features provide a wide scope for personal interpretation.

Procedures

After informed consent had been obtained, all 30 subjects completed the LPQ during normal class time. Students were made aware of the nature of the questionnaire and were given instructions in how to answer. The subjects were well separated in seating and all were given equal answering time.

The following day, the six chosen subjects individually completed the experimental tasks. Testing took place in a vacant music room in the mid-morning. Each student was asked to study the score, play it through and then give a description of how they would practice it for performance. This procedure was carried out three times, once for each score, in order of increasing complexity. There was no set time limit for these interviews.

Each interview was recorded in its entirety and students were aware of this. They were informed that the reason for recording was to save time in note-taking. The tape recorder was positioned near the performing area and only ceased recording at the close of each interview.

Scoring

The transcribed responses were analysed according to two criteria: evidence for depth of processing as indicated by reference to components of the eight level model of musical processing, and evidence of structural complexity as described by Biggs and Collis' (1982) SOLO Taxonomy. As illustrated in Figure 1, there is now a recognised equivalence between SOLO levels and processing focus under the eight-level model of text processing. Biggs and Collis' Unistructural level, for example, is

taken as corresponding to processing at the word group and individual idea level;
multistructural responses at the level of main ideas; relational responses at the level

of closed or text-based themes; and extended abstract responses at the level of open or text-independent themes. A description of responses illustrating scoring at each of these levels follows:

1. Prestructural: Characterised by no response or an irrelevant response to the cue.

No data was classified at this level.

2. Unistructural: Responses categorised at this level typically include only one dimension relevant to the problem solution. In learning music this typically involves use of a sequencing strategy in which discrete units of notation are

rigorously rote-learned as a means of attaining technical competence. The strategic basis of responses at this level characteristically do not go beyond selection and

acquisition. The response of Student 3 on Score 1 provides an example:

I'd just...um...keep playing it, and if I got any mistakes I'd fix it up...like I'd

keep going over the same spot if I kept getting it wrong. Just like that I s'pose... 'til I got it right.

3. Multistructural: Responses at this level characteristically include multiple dimensions of the problem. In learning music, this level of response typically

includes reference to aspects of the music beyond notation. The dimensions, however, are not explicitly linked. Thus responses at this level do not reflect a more integrated understanding of the musicality of the score. An example of a marginal multistructural response is evident in the case of Student 2, Score 2. In this

instance, the reference to the dynamic markings indicates awareness of additional dimensions of musicality, but these do not appear to be directly linked to the learning of the notation: they appear to be expressed simply as another dimension to learn:

Same again...take it in sections again, like..specially the hard

parts...the bars

at a time I mean and get them right. Do the rit. and the dynamics, probably

4. Relational Responses: A focus on the relationships between main ideas as the

point of integration and explanation, rather than simply identifying and/or describing individual components. Musically this implicates an awareness of the

overall musicality of the score: that technical competence represents only part of

musicality. At this level, responses explicitly incorporate aspects of musical

expression as a means of integrating the components of the score into a coherent

theme or musical idea. Student 4, Score 2 provides an example:

Because this one is a little harder, I'd try to sing it through to see the type

of piece and get the form...for me...it's easier this way even if I don't get the

notes right, I have a better understanding of it. So I'd learn it in phrases I

think...and maybe intervals if there are hard ones, and do the expression afterwards like I said before.

5. Extended Abstract: At the extended abstract level, the point of integration in the

music is taken beyond the perspective imposed by the composer. The sense of musicality is highly personalised, incorporating the literal elements of the score, but

adding to these an individualised interpretation. In the case of Student 4, Score 1,

the point of integration incorporates the possibility of the students' own sense of

dynamics and expressiveness as a means of achieving the desired musical outcome:

I can handle this...so I would probably be sure that I am playing the correct

notes and can pitch them straight away...and then build on that, trying to make the piece musical. I'd do this by smoothing it all out, playing the notes evenly, being expressive...I mean, following the dynamics or doing my own if it sounds too boring, and...yeh I'd learn it first and then add to it,

although I could probably do both at once.

All responses were scored by the second author and a trained assistant.

Interrater

agreement of 83% was achieved with differences resolved by discussion.

Results

Transcripts of student responses to the experimental task are presented in Table 3 in the case of the high surface students, and Table 4 in the case of the high deep students.

Surface Students

On the basis of previous research, it was expected that the surface oriented students would consistently display both a shallow conception of the nature of the problem to be solved (in this instance, practising novel music to a performance level of competency), and would indicate a narrow and restrictive array of learning strategies, regardless of the level of difficulty of the material to be learned. These predictions were largely verified in the responses of the three surface students.

INSERT TABLE 3 ABOUT HERE

1. Conception of task: There were few indications in any of the responses by the surface students that the task of developing performance level competence involved more than technical competence and fluency. This was consistent across all levels of difficulty. Student 1, for example, repeatedly emphasised the need to attain literal accuracy: "I'd probably just do every four bars over and over and over until I got it right and it sounded good ... " (Score 1); " ...I'd just practice it each afternoon until it was right" (Score 2); "I'd get other people to pick up my mistakes....and practice on those , and just hope I get better" (Score 3). Similar statements were evident in the responses of Students 2 and 3 (see Table 2). The emphasis on the need for technical accuracy was further reflected in the restricted attentional focus of all three students. For all scores, the attentional focus was no higher than the level of musical phrases (equivalent to individual text ideas), with the predominant level of focus being at the cluster (word) and motif (word group) levels (see Table 3). By focusing at these levels, the students were restricted in the potential

level of
outcome: without reference to higher-level units of meaning, none of the
students
gave evidence of concern for the musicality of the scores, either at the
level of
musical ideas or at the level of musical subject. All responses thus
indicated lower-
level conceptions of the task, with SOLO ratings of unistructural for all
responses
with the exception of Students 2 and 3 in relation to Score 2. In the
latter instances,

peripheral reference to dimensions beyond notational accuracy were
included, but
were undeveloped.

2. Strategic behaviours: Given the shallowness of the surface
students'
conception of "learning music", it is not surprising that the strategic
repertoire
implied by the responses was also similarly narrow. Two consistent
strategies were
evident in all responses at all levels of difficulty: the reliance upon
rote learning
techniques, and, where this strategy was deemed ineffective, immediate
recourse to
external aid. Within the constraints of a rote learning strategy, there
was evidence
of awareness of difficulty. Student 1, for example, reduced the size of
"chunks" to
be rote practiced from 4 bars to 2 bars in response to the increased
complexity of
Score 2 above Score 1. However, the students did not see the increased
complexity
in terms of musicality, but rather in terms of the notation itself. Rather
than resolve
the increased complexity by attempting alternative procedures, all subjects
were
inclined towards resolving technical problems by either reducing the units
of
notation to be practised, or by referring to external support, such as
tutors.
Whether this recourse was due to a lack of awareness of other approaches,
or
whether it was due to a sense of pragmatism is uncertain in the present
data.
However, statements such as "'I'd take that one straight to my teacher 'cos
that's a
hard one" (Student 2, Score 3), and "I'd just practice that over again

because it's really weird and ... um ... I'd just keep going over it I suppose" (Student 3, Score 3) appear to indicate a sense of strategic confusion when confronted with complex musical data (cf. Cantwell & Moore, 1991; Cantwell, 1992). By implication, one may reasonably assume that, as has been demonstrated in text processing (Marton & Saljo, 1976; van Rossum & Schenk, 1984), surface strategies in the learning of music are essentially limited to literal understanding of the presented data. Where such understandings are difficult to extract without co-reference to higher level musical meanings, then the dispositional use of rote strategies becomes inadequate.

Deep Students

Unlike the surface students, it was expected that the deep students would approach the problem of learning music to a level of performance competence under the control of a quite different conceptual understanding of music, and with a richer and more flexibly applied strategic repertoire. These predictions were largely supported in the responses of the deep students.

INSERT TABLE 4 ABOUT HERE

1. Conception of Task: A theme apparent through all of the deep student's responses was for explicit attention to be given to the higher-level components of the scores being learned even while consciously attending to lower-level routine learning of notation. While all deep students were aware of the need for technical competence, as was the case with the surface students, deep students were also aware of the need to contextualise the technical components into a broader sense of musicality. Student 4 on Score 2 expresses this dual focus succinctly. She begins by emphasising the need to understand the nature of the music. This she achieves by "singing it through", acknowledging that while this may be at the expense of note accuracy, it allows her to "have a better understanding of it". Once she achieves

understanding, she is then prepared to focus on smaller units to achieve technical competence: "So I'd learn it in phrases I think ... and maybe intervals if there are hard ones". Technical competence then becomes the prelude to musicality: "... and do the expression afterwards, like I said before". The response of Student 4 was typical across all levels of difficulty of those responses rated at a relational level (see Table 4). Conceptually, the responses focus at the higher thematic level of musical subject, while explicitly and selectively incorporating attentional focus at the component lower levels.

In a number of instances, the students extended the level of thematic integration by imposing their own interpretative framework on the score. These responses, rated at the extended abstract level, all included enhancement at the level of musicality. Student 6 on Score 3 provides an example. The student began by ensuring that her playing would be note perfect, acknowledging the need to devote specific attention to the more difficult technical aspects of the score. She then adds to this the sense of musicality: "It's a strange piece of music, so if people are going to listen to it I'd have to make the hard spots clear and accurate, make contrasting dynamics ... I might even add my own ... and do the slurs spookily because it sounds haunty ...and the tempo changes obvious, and everything".

2. Strategic behaviour: Unlike the surface students, the strategic behaviours of the deep students reflected both greater breadth as well as a high degree of flexibility. This is to be expected, given the wide range of conceptual concerns indicated by the responses. Typically, the deep students followed a format of initially assessing the difficulty level of the score, then attending to specific technical aspects of the notation (usually adopting a rote learning strategy), and finally extending the technical competency to incorporate elements of musicality.

Student 5

exemplifies this progression across all scores: " ... just play it through first to get a feel for it, and it's rather easy 'cos it's just crochets ... and look at the dynamics after that" (Score 1); " There are some obvious bits I can't do It's a happy tune so I'd try to play it like that after I could manage the notes ..." (Score 2); "I'd probably learn this one bar by bar, and get the notes right and take it slower until I gradually build it up ..." (Score 3).

Discussion

The purposes of this study were two fold: to assess the relationship between students' reported approach to learning and the manner in which students approached the learning of new music; and to assess the relationship between the depth of focus of content concern and the strategic behaviour of students in learning new music. We predicted that, in contrast to those students reporting a surface approach to learning, students reporting a deep approach would be more mindful in engaging the task of learning music, would conceive of the nature and goals of the task in more abstract terms, would report a greater depth and variety of content concerns in addressing each score, and would display a greater degree of planning and flexibility in strategic behaviour. The data strongly supported these predictions.

The responses of each of the deep students across all levels of difficulty of scores were consistently at the relational or extended abstract level. These students defined the problem to be solved in terms of musicality rather than technical competence. While the focus of content concern for the deep students was clearly at the level of musical subject, all students consistently addressed the need to achieve lower level automaticity if the goals of higher-level musicality were to be

achieved. In this sense, the deep students displayed a high degree of flexibility in both content concern and associated strategic behaviour.

By contrast, the surface students were clearly constrained to a quite restrictive conception of the nature of the problem to be solved. Where the deep students saw the learning of music as an ill-structured problem requiring the orchestration of a variety of solution strategies, the behaviour of the surface students was more closely associated with a perception of the task as a well-structured problem, requiring only the application of an existing strategic algorithm to achieve solution. The consistent processing focus at levels not beyond that of the musical phrase indicates a perception of music as data to be acquired rather than data to be both acquired and actively interpreted. This perception was consistent with the reliance upon a rote learning strategy, combined with seeking external support, as the limit of observed strategic behaviour. The outcome of this approach to learning music was logically lower level: in terms of Biggs and Collis' (1982) SOLO levels, most responses by the surface students were at the unistructural level, with some at best at a marginal multistructural level.

While the study involved only a small sample of subjects, the results nonetheless are consistent with existing research into the relationship between approaches to learning and learning outcomes (Cantwell & Biggs, 1988; Kirby & Pedwell, 1991). If the data can be taken as indicative of a more general pattern in the learning of music, and this assumption clearly requires further research validation, then the implications for instructional processes in music education are significant. If the goal of music instruction is to develop mindful engagement with the score, in the sense used by Salomon and Globerson (1987), then it is apparent that those technically skilled musicians who approach the task of learning of music with surface motivations and strategic behaviours are unlikely to develop the

higher-order skills associated with competent musicianship. The data suggest strongly the need for instructional processes to incorporate the development of deeper processing activities as an analogue to technical skill development if musical learning to the level of performance competence is to be achieved.

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Figure 1: Equivalence of levels attentional focus and SOLO levels in

processing textual
information and musical scores.

LEVELS OF
MEANING
(Text Processing)

THEMES

MAIN IDEAS

IDEAS

WORD GROUPS

WORDS

SYLLABLES

LETTERS

FEATURES

SOLO LEVEL

EXTENDED
ABSTRACT

RELATIONAL

MULTI
STRUCTURAL

UNISTRUCTURAL

PRESTRUCTURAL

LEVELS OF
MEANING
(Musical Score)

MUSICAL THEMES

MUSICAL IDEAS

PHRASES

MOTIFS

CLUSTERS

INTERVALS

NOTES / SIGNS

FEATURES

Figure 2: Examples of musical score at each level of processing.

LEVELS OF MEANING
(Musical Score)

MUSICAL THEMES

MUSICAL IDEAS

FIGURES

MOTIFS/GROUPLETS

CLUSTERS

INTERVALS

NOTES / SIGNS

FEATURES

Table 2: Characteristics of subjects

Subject	Surface Score (z-score)	Deep Score (z-score)	Musical Grade	Mathematics Class	Science Class
Student 1	39 (0.22)	29 (-1.16)	2	1	1
Student 2	46 (1.42)	32 (-0.70)	2	1	1
Student 3	41 (0.56)	28 (-1.32)	5	2	4
Student 4	30 (-1.16)	44 (1.13)	2	4	3
Student 5	31 (-1.33)	44 (1.13)	4	4	3
Student 6	31 (-1.33)	41 (0.67)	5	1	1

Table 3: Responses of High Surface learners to the three musical scores

Score

Student

Response

SOLO Level Focus of

Processing 1 1

2

3

Um, I'd probably just do every four bars over and over and over until I got it right and sounded good...and then I'd put it all together...yep, I'd just go over it and just learn it.

I'd probably, kind of, take it in sections, and if I didn't know it properly still, I'd take it to my teacher and learn it in my lesson.

I'd just...um...keep playing it, and if I got any mistakes I'd fix it up... like I'd keep going over the same spot if I kept getting it wrong. Just like that I s'pose...'til I got it right.

Unistructural

UnistructuralPhrase

Motif/

Phrase

Cluster/
Motif 2 1

2

30h, well...I would firstly do the first two bars and go over them. Any questions I had I would ask my music tutor and I'd probably take it to my lesson if I wasn't confident on it...and I'd just practice it each afternoon until it was right.

Same again...take it in sections again, like...'specially the hard parts...the bars at a time I mean and get them right. Do the rit. and the dynamics, probably.

I'd just practice it the same probably...but I'd make sure I count all the way through and just practice it over and over again. Unistructural

Marginal
Multistructural

Marginal
Multistructural Motif

Cluster/
Motif

Cluster/
Motif 3 1

2

3Well...that's a hard one. That one I would definitely take to my tutor and get him to take me through it. I would tape myself and listen to it and see how it sounds. I'd get other people to pick up my mistakes...and listen to me when I play it to pick up my mistakes...and practice on those, and just hope I get better.

I would take that straight to my teacher 'cos that is a hard one...and I'd get all the sharps and flats all better.

I would just practice that over again because it's really weird and...um...I'd just keep going over it I s'pose.Unistructural

Unistructural

UnistructuralCluster

Notes/
Intervals

Table 4: Responses of the High Deep learners to the three musical scores

Score
Student
ResponseSOLO
LevelFocus of
Processing 1 4

5

6

I can handle this...so I would probably be sure that I am playing the correct notes and can pitch them straight away...and then build on that, trying to make the piece musical. I'd do this by smoothing it all out, playing the notes evenly, being expressive...I mean, following the dynamics

or doing my own if it sounds too boring, and...yeh
I'd learn it first and then add to it, although I
could probably do both at once.

Oh well...just play it through first to get a feel for
it, and it is rather easy 'cos it's just crotchets...and
look at the dynamics after that, and make sure
that I'm playing it right by having people listen to
me. It's not an exciting piece but I'd try to make
each note clear and sound nice anyway. It says to
play slowly, which I would do anyway even if it
was hard until it sounded good.

First I'd look at the key signature to see how
many sharps and flats there are, and I'd look
through and find them so that I would have an
idea of how hard it is. Then I'd play it slowly
through as it is not rhythmically difficult so that I
could see what style it's in, how fast it should go
to fit the mood...and to see what problems there
are. Because it's easy, I'd have to play nicely to
make it good to listen to. Extended
Abstract

Relational

Relational

Musical
Subject

Musical
Subject

Musical
Subject 2 4

5

6Because this one is a little harder, I'd try to sing it through to see the type of piece and get the form...for me...it's easier this way even if I don't get the notes right, I have a better understanding of it. So I'd learn it in phrases I think...and maybe intervals if there are hard ones, and do expression afterwards like I said before.

There are obviously some bits that I can't do, so I'd have to pull those notes out and practice the intervals and accidentals, and that. It's a happy tune so I'd try to play it like that after I could manage the notes...putting in the dynamics, rit. and tempo of course.

I can see this is a bit more demanding because more notes and rhythm are there ... and I have to be careful of the sharps. See the key signature, I'd make sure that I'd memorised the F# and C# and I'd...probably practice each interval in the hard

parts so that I can pitch them straight away, so
that when I go to play it all through I don't
stumble all the time.

Relational

RelationalMusical
Subject

Musical
Subject

Musical
Subject