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RUNNING HEAD: Musicians’ use of mental practice and score analysis

Performing musicians’ understanding of the terms “mental practice” and “score analysis”

Philip Fine

University of Buckingham

Karen Wise

Guildhall School of Music & Drama

Ricardo Goldemberg

University of Buckingham / State University of Campinas, Brazil

Anabela Bravo\*

University of Buckingham

\* deceased

Authors Note

Philip Fine, Senior Lecturer in Psychology, University of Buckingham, UK

Karen Wise, Research Associate, Guildhall School of Music & Drama, London, UK

Ricardo Goldemberg, Visiting Research Fellow, University of Buckingham, UK

Anabela Bravo, Post-Doctoral Fellow, University of Buckingham, UK

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Correspondence concerning this paper should be addressed to Philip Fine, Department of Psychology, University of Buckingham, Hunter Street, Buckingham, MK18 1EG, United Kingdom Email: philip.fine@buckingham.ac.uk Phone: +44 (0)1280 828 322

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Performing musicians’ understanding of the terms “mental practice” and “score analysis”

Musicians commonly speak of *mental practice* and *score analysis* in referring to strategies widely used by performers. However, these terms may not be universally understood in the same way. To address this, 89 experienced musicians were surveyed as to their views and experiences concerning mental practice and score analysis, using a mixture of closed/rating scale and open-ended questions. They were asked what they understood by these terms and what information these strategies enabled them to obtain from the score. Results suggest that mental practice and score analysis are both considered useful, though mental practice more so. Content analysis identified the main characteristics of mental practice as: occurring away from the instrument; involving several types of imagery, often in real time; and focusing on performance preparation, particularly aspects of execution and realisation. During mental practice, the score tended to function more as a memory aid, an orientation guide, and as a point of reference for interpretation. Score analysis was considered more theoretical, though still relevant for performance preparation at a range of levels from exploratory to detailed. During score analysis, information primarily increased musical understanding of the piece, and related to both structural (e.g. form, harmony) and aesthetic (e.g. tempo, phrasing) aspects. The findings are discussed in terms of the current understanding of mental practice and score analysis in the literature, and the relationship between them. Mental practice and score analysis do have similarities, such as their benefit to performance preparation, and distinctions, for instance concerning their specific aims. However, they may be best considered as lying on a continuum of strategies for performance practice and enhancement, rather than as two distinct behaviors.

Much has been written on mental practice and its role in performance preparation, not just in music (Clark, Williamon & Aksentijevic, 2012; Connolly & Williamon, 2004), but also in many other domains, such as sport (Gould, Voelker, Damarjian, & Greenleaf, 2014; Moran, Guillot, MacIntyre, & Collet, 2012), surgery (Arora et al., 2011; Cocks, Moulton, Luu, & Cil, 2014) and also for physical rehabilitation after stroke (Braun, Beurskens, Borm, Schack, & Wade, 2006; Schott, Frenkel, Korbus, & Francis, 2013). Given its wide utility, it has been defined in many ways, and may be interchangeable with other similar terms[[1]](#endnote-1). Although there is no clear consensus as to its characteristics, in music at least the term is generally agreed to cover the use of imagery (Clark et al., 2012) and the development and manipulation of cognitive representations in order to enhance performance (Lehmann & Davidson, 2002). Cocks et al. (2014) argue that mental practice can enhance skill acquisition and performance optimization in surgery, and it is likely that equivalent forms of cognitive representations are involved. Musicians’ use of mental practice primarily involves the development of motor, kinaesthetic and auditory representations in order to enhance performance, for instance by assisting memorization (Bernardi, Schories, Jabusch, Colombo, & Altenmueller, 2013) and developing technical excellence in performing. Imagery is of central importance: indeed, Clark and Williamon (2012, p. 472) suggest that imagery and mental practice may be different terms for the same thing.

Another skill that may be related to performance preparation and which is an important component of musicological training is score analysis. Analysing scores enables musicians to identify underlying structure and gain a better understanding of the piece. Musicologists and student composers often analyse scores to better understand compositional techniques. Although less has been written about how score analysis may be used by performers in preparation for their performances (Mawer, 1999, 2003; Rink, 2002; Vaughan, 2002) than about mental practice, an understanding of the piece and its structure is undeniably important for performers (Aiello & Williamon, 2002, Ginsborg, 2004).

Given the number of ways that musicologists, music psychologists and music educators have described mental practice and score analysis (not to mention those outside the domain of music performance with respect to mental practice), it is pertinent to ask music performers themselves for their views on both of them, as well as how useful they are perceived to be. The overall focus of this paper is thus performers’ understanding of what mental practice and score analysis entail and the benefits musicians perceive from their use in performance preparation. Asking the same musicians about both types of activity will enable the relationship between mental practice and score analysis to be examined, together with their implications for expert performance. Moreover, in order to better understand performers’ orientation to and use of the notated musical material in both these types of activity, we asked performers exactly what information they felt they obtained from the score both when carrying out score analysis and mental practice.

**Performance**

The performer’s task is to produce as high a quality musical performance as possible, and, to achieve this, their performance preparation will require various skills (Clarke, 2002, Davidson, 2002, Gabrielsson, 1999, Williamon, 2004), which may involve mental practice and score analysis. For instance, Gabrielsson (1999) points to two major components: a genuine understanding of the music and its structure, and mastery of instrumental technique. Williamon (2004) discusses three categories of skills: physical, psychological, and general musical, and Clarke (2002) notes the importance of both physical and mental skills in performance preparation. Expert performance may also involve large-scale memorisation (Ginsborg & Sloboda, 2007; Lehmann, 1997; Sloboda, 2005) and high levels of conscious motor control (Lehmann, 1997). Compared to novices, expert musicians have better cognitive and psychomotor adaptations to novel situations, are more able to explain and verbalize what happened in the course of performance, play more consistently, and are less affected by extraneous conditions (Lehmann & Davidson, 2002).

In terms of the process of performance preparation, musicians may follow a performance plan, comprising various stages, from initial reading through learning to final performance (Chaffin, Imreh, & Crawford, 2002, Lisboa, Chaffin, Schiaroli, & Barrera, 2004; Sloboda, 1985). For instance, Sloboda (1985) considers three main stages: sight-reading, practice, and polished performance. Sight-reading involves producing a rendition of the piece at first sight of the score and can be considered a transcription task (Fine, Berry, & Rosner, 2006; Shaffer, 1978, also referred to in Clarke, 2002; Sloboda, 1978; Waters, Townsend, & Underwood, 1998), involving conceptual knowledge and various cognitive and perceptual processes (motor, visual, auditory, kinaesthetic, memory, and problem-solving). Sight-reading rarely produces a completely satisfactory performance, so the musician will usually practice or rehearse the piece. The aim of this practice stage is to improve performance until it is of an adequate standard. The last stage is polished performance, which may involve playing from memory. At this stage, the performance will have become automatic, at least to an extent–Fitts & Posner’s (1967) final autonomous stage of skill acquisition–allowing more attention to be paid to subtleties of performance expression and interpretation and less to technical aspects. Different stages will no doubt involve different skills. For instance, Bravo and Fine (2009) asked musicians at which stage, during the learning of a new piece for performance, mental practice and score analysis were most useful. Mental practice was deemed useful right from initial sight-reading through to memorizing the piece prior to performance, whereas score analysis was reported as being useful particularly when the musician was exploring and becoming fully familiar with the piece, but less before and during initial sight-reading.

Even though researchers conceptualise the stages leading to final performance in different ways (e.g. Chaffin et al., 2002, Lisboa et al., 2004), the performer’s overall task is to develop familiarity with the structure of the piece, and to create good enough mental representations (Lehmann, 1997; Lehmann & Davidson, 2002) to enable subsequent performance with a high degree of both technique and appropriate expressivity. This raises the question of how the performer is able to develop and consolidate these higher level mental representations, suggesting a role for mental practice and score analysis, both of which are discussed below.

**Mental practice**

Mental practice has been defined as “cognitive or imaginary rehearsal of a physical skill without overt muscular movement” (Connolly & Williamon, 2004, p. 224; see also Clark, Lisboa & Williamon, 2014; Clark, Williamon & Aksentijevic, 2012; Coffmann, 1990; Gregg, Clark, & Hall, 2008), and it is generally agreed to be an efficient means of preparing for performance. For instance, 70% of a sample of classical music performers including instrumentalists, singers, and conductors stated that mental practice was very useful or even vital to them (Fine & Bravo, 2011). There is a clear relationship between mental practice and imagery, and most researchers agree that several forms of imagery are involved in musical mental practice (Clark et al., 2012, Lehmann, 1997, Holmes, 2005). These include: audiation, hearing the music internally in the absence of actual sound; visualisation, seeing the score or the performance situation in one’s mind; kinaesthetic imagery, imagining the feel of the instrument under one’s hand, for instance; motor imagery, imagining the movements required, such as fingering for pianists; and emotional imagery, imagining the expressive aspects of a performance. In her research on musical imagery, Bailes emphasises audiation, defining musical imagery as “the conscious experience of music in the absence of corresponding environmental input” (Bishop, Bailes, & Dean, 2013, p. 1), and discussing “tunes on the brain” (Bailes, 2007), also called *earworms*, or involuntary musical imagery (INMI), which are often experienced as positive or neutral (Williamson & Jilka, 2014) though occasionally they are unwelcome (Beaman & Williams, 2010). Audiation is very common when reading a score (Brodsky, Henik, Rubinstein, & Zorman, 2003), and we have previously shown that over 90% of music performers surveyed claim that they always or frequently hear the music in their head when reading a score away from the instrument (Fine & Bravo, 2011).

Mental practice and imagery have many functions and can lead to numerous benefits for musical performance (Clark et al., 2012; Connolly and Williamon, 2004). According to interviews with conservatoire level musicians, mental practice is considered useful for: developing emotional expressivity; enhancing technique and practice efficiency; improving learning and memorization (see also Rubin-Rabson, 1937); heightening sensory awareness; refocusing attention during performance; enhancing general confidence and resilience in a performance situation; enabling greater control over negative emotions; establishing a stronger connection with an audience; and achieving peak experience (Connolly & Williamon, 2004, pp. 225-226; see also Clark et al., 2012). Mental practice can also be useful in situations when physical rehearsal is not possible and to help protect against injury, such as focal dystonia caused through overuse (Clark et al., 2012). However, these studies defined mental practice in fairly general terms, and there is a need to clarify what characteristics and strategies it entails.

Although interview studies such as those cited above can illustrate why musicians use mental practice and imagery, additional empirical evidence can provide better support for the widespread claim that mental practice and imagery do indeed enhance performance quality. Research investigating this has been mixed (Clark et al., 2012), possibly due to the wide variety of tasks and measurements of imagery and mental practice used, but it is generally agreed that mental practice is effective at enhancing performance, although not as much as physical practice (Bernardi, De Buglio, Trimarchi, Chielli, & Bricolo, 2013; Clark et al., 2012; Driskell, Copper, & Moran, 1994; Pascual-Leone et al., 1995). Indeed, combining mental practice with physical practice is likely to be the most effective approach (Clark et al., 2012; Ross, 1985; Rubin-Rabson, 1941), and this has been demonstrated in athletes also (Azimkhani, Abbasian, Ashkani, & Gürsoy, 2013).

Historically, mental practice has not generally been taught, but is something that is expected to develop with experience, although at elite levels it may be made more explicit. However, there is a view that mental practice should be taught to music students as a technique to complement physical practice. More recently, mental skills training has been incorporated into some music conservatoire teaching, using ideas gleaned from training elite sportsmen and women (e.g. Clark & Williamon, 2011; Williamon, 2004). Connolly and Williamon (2004) suggest that, to be effective, mental practice should be viewed as a long-term commitment, and Provost (1992) recommends the regular use of mental practice for repertoire maintenance.

**Score analysis**

Analytical approaches towards the score aim to discover what is or is not structural within the musical discourse (White, 1994). Several performance implications arise from this structural knowledge, such as enabling the performer to enhance interesting details. For instance, Folio (1991) shows how a grace note in a Bach flute sonata can be considered part of the melodic structure, and therefore needs to be highlighted in performance. According to Narmour (1988), music analysis is indispensable to performers as it helps them to plan, execute, and evaluate their performances. So from an analytical point of view, a particular performance can be appreciated as being either good or bad, i.e. “awareness in performance should increase discernment in selecting between interpretations” (Mawer, 1999, p. 181).

According to Howell (1996), analysis enables us to go behind the surface detail and acquire an overview of the score, and relate the details to the overall meaning of the piece. One important issue about musical interpretation is the ability to achieve a balance between the surface detail of the musical score and its deep or background level, which is broadly related to the piece as a whole (e.g. Cook, 1987). An empirical study by Williamon, Valentine, and Valentine (2002) demonstrated that musicians shift their focus of attention between local detail of the piece of music, and more global levels of understanding, within their performance practice. This understanding at multiple levels is the goal of many analytical music theories.

Provost (1992) suggests that certain aspects of analytical study of a score, such as studying sections as isolated units, analysing harmony, singing individual lines, and developing compositional and structural awareness, can assist memorization and improve learning efficiency. Indeed, research (e.g. Aiello & Williamon, 2002; Chaffin et al., 2002; Ginsborg, 2004; Williamon et al., 2002) has suggested that using analysis to elucidate the formal structure of a piece of music allows it to be memorized in logical sections. In fact, “for skilled musicians, the formal structure of the music provides a hierarchical organization to serve as a retrieval structure and performance cues provide the retrieval cues to activate the upcoming passage in long-term memory” (Ginsborg, Chaffin, & Nicholson, 2006, p. 189). These retrieval structures are referred to as performance cues (Chaffin et al., 2002; Ginsborg et al., 2006).

Further empirical examples of the use of analysis by performers point to its value (Mawer, 1999, 2003; Vaughan, 2002). Almost 80 years ago, Rubin-Rabson (1937) showed that analytical study prior to performance (as well as mental practice) was useful. Vaughan (2002) examined the impact of analysis teaching on performance, and demonstrated that various analytical approaches, including Schenkerian, motivic, and harmonic, were employed for solving interpretational problems, mainly memorization. Students stated that analysis helped them develop more intuition about the piece, and become aware of the learning process (compare Swanwick, 1994).

For musicians to be able to use analysis in their performance preparation, as Vaughan (2002) showed, arguably they need to be taught how to do so, either explicitly or implicitly through example. Some music teachers believe that music analysis, perhaps even more than mental practice, should be included in performance lessons, and it is considered one of the skills required to achieve good performance results (Ward, 2004). In the UK, in order to progress to higher practical exam grades, students must pass theory papers, ensuring at least a minimum level of knowledge relating to musical form and terminology. Mawer (1999) states that linking analysis and performance in teaching should stimulate the performer’s intellectual faculties by encouraging a spirit of enquiry and investigation, and thus generate versatile musicians who can apply analytical and evaluative skills in future performance. Rink believes that “...performers continually engage in a kind of analysis as an integral part of building an interpretation” (Rink, 2004, p. 40).

Analysis in lessons may be expected to enhance students’ understanding of the music, and may lead them to perform better or find music more interesting. Moreover, analysis expands students’ view towards hearing the whole piece, and not only their part. It also can increase the students’ aural (and audiation) skills, eventually enabling them to better understand an unfamiliar score (Casey, 1991). Casey documents instrumental teachers’ statements concerning the usage of analysis in an educational context to help musical skills, and ultimately to improve performance. Teachers’ statements refer particularly to aiding intonation, score reading, memorization, and developing autonomy and research habits (such as building music dictionaries and study guides).

Mawer (1999, 2003) investigated the use of musical analysis in string pedagogy. Her pedagogical approach was to use non-tonal analysis, approaching the piece through set theory (2003) and to focus on voice-leading analysis of Bach’s music for unaccompanied strings (1999). Results of both studies suggested that establishing an analytical connection with the student’s principal instrument makes musicological study more interesting and stimulates intellectual enquiry and creative interpretation, as well as enhancing performance. Some of her students viewed the study of analysis as being a long-term investment, related to similar views above for mental practice (Connolly & Williamon, 2004).

As we have already seen, mental practice requires the manipulation of mental representations in a meaningful way, and the development of these mental representations through an understanding of the structure of the piece may be gained in a number of ways, one of which is through analysing the score visually. Hearing the music, either through audiation or by playing it, or through a combination of hearing and score analysis, is also possible, and there is likely to be individual variation in preferences for these approaches (Hultberg, 2008). However, analytical insight no doubt interacts with the performance plan (Kopiez, 2002), and Chaffin and colleagues (2002) suggest that mental practice is commonly related to analytical study, but the nature of this relationship is not clear. Indeed, Fine and Bravo’s (2011) respondents generally felt that mental practice was more useful than score analysis.

**Present research**

Given the above discussion, both mental practice and score analysis appear relevant to performance preparation and thus useful to musical performers. But given the wide range of definitions for these terms, it is worth asking what musicians themselves understand by them, whether they find them useful, and, if they do, at what stages of performance preparation.

The qualitative data discussed in this article come from a questionnaire study investigating musical performers’ views of mental practice and score analysis. Details about the sample are given in the Methods section. Quantitative data for the same sample have been reported elsewhere (Bravo & Fine, 2009; Fine & Bravo, 2011). Given the different terminology used by musicologists, music psychologists, musicians and music educators, the aim of the present paper is to explore performing musicians’ understanding of mental practice and score analysis, by examining both their understanding of the terms and their use of the score in each case. By asking about both mental practice and score analysis, similarities and differences between them and their perceived utility should become apparent, allowing us to better understand their relationship. A broader motivation for this research is to encourage cross-disciplinary interactions within music psychology, music theory, and music education, since interpretive choice and the roles of analysis and mental practice in performance preparation need to be understood within the teaching context.

**Method**

**Participants**

A convenience sample of 89 performing musicians in the UK (*n* = 60), Portugal (*n* = 21), and Spain (*n* = 8) responded to an online questionnaire. The reason for surveying musicians from these three countries was practical, utilizing contacts of the first and fourth author, thereby increasing the sample size and making the sample more representative. However, as the non-UK samples were relatively small, no cross-country comparisons were envisaged or planned. Their age ranged from 19 to 70 years (median 35 years). Fifty (56%) stated that they were professional, 24 (27%) semi-professional, and 15 (17%) amateur. They were active in a range of genres and styles, but these were dominated by Western Art Music. Forty-six were male, 40 female, and three did not state their gender. In all, 65 (73%) completed all parts of the questionnaire. The respondents played between one and four instruments, including conducting (see Table 1), and had done played their primary instrument for between 4 and 56 years (median 17 years). Over half the respondents were pianists, a third sang, and over a fifth were conductors. In all, 26 instruments were mentioned, as well as conducting and singing. Forty-eight were trained in formal musical analysis, and 17 had not had any such training.

TABLE 1 ABOUT HERE

**Materials**

The questionnaire consisted of 18 questions, both open and closed, providing quantitative and qualitative data. Once the respondents had given informed consent, demographic information, as described above, was collected. The questionnaire then asked what respondents understood by the terms *mental practice* and *score analysis*, how useful they found them, when they use them and what information from the score they obtain in the process. The fourth author, a native Portuguese and proficient Spanish speaker translated the questionnaire into Portuguese and Spanish, so that all respondents were able to complete the survey in a language in which they were most proficient, i.e. English, Portuguese, or Spanish. Although it is always a possibility that translating terms into other languages may reflect subtly different concepts, this was felt not to be an issue in the present study, as the terms have very clearly related forms in all three languages: ‘prática mental’ and 'análise da partitura’ in Portuguese, and ‘practica mental’ and 'análisis de la partitura' in Spanish: ‘partitura’ is the word for score or manuscript in several European languages. A full copy of the English version of the questionnaire forms Appendix A.

**Procedure**

Once ethical approval was obtained from the relevant University committee, the online surveys were uploaded to SurveyMonkey® and publicized to groups of performing musicians. Spanish and Portuguese responses were translated into English prior to data analysis by native speakers of each language and then checked by the third author, also a native Portuguese speaker and proficient speaker of Spanish. Being of a qualitative nature, the data for the present article were analyzed using content analysis (Berelson, 1952; Hsieh & Shannon, 2005). Survey responses were read through carefully, organized, and categorized in an inductive fashion. Participants’ responses were divided into substatements expressing distinct ideas, and organized by similarity. A single participant’s response could contain one or more substatements, but a substatement was not allowed to belong to more than one category. These emergent categories were named and grouped into meaningful clusters (superordinate categories) by the second author. Triangulation was carried out by two of the other authors, and any differences were reconciled by discussion. Four content analyses were carried out, relating to the questions “what do you understand by this term” and “what information do you get from the score” for both mental practice and score analysis.

**Results**

The four analyses are discussed here in turn, followed by a consideration of where the commonalities and differences are in order to understand how participants’ understanding of score analysis and mental practice are related.

**Mental Practice**

Of the 89 participants, 70 gave responses to the question *What do you understand by the term ‘mental practice’?* The analysis categorised 160 substatements resulting in three superordinate categories: Characteristics (73), Activities (61), and Aims (28). Table 2 details the categories within these overarching sets, and numbers in parentheses refer to the number of substatements within each category and subcategory.

TABLE 2 ABOUT HERE

In Characteristics, there was a strong sense of mental practice being carried out without actually playing or singing, with the majority of responses referring to being *away from the instrument*, either explicitly or implicitly (for example “Using the imagination to learn music–imagining the movements required to successfully execute the music” M, 31 years old), or referring to practice carried out *in the mind*. The use (or not) of a score was referred to by 14 respondents, with only three of those specifying that mental practice did not involve a score. Three people said they did not use the term or were uncertain what it meant, while eight gave definitions that were very broad, such as “to discover the meaning, the message and the objective of a musical piece” (M, 57 years old) or “to develop all mental ability” (F, 28 years old).

It is clear that the primary type of Activity associated with mental practice is *mental imagery*. The most frequently mentioned types of imagery were *audiation* and *visualisation*. The latter referred to imagining playing or practising and may therefore be thought of as multi-modal, rather than strictly visual. The three instances in which participants specifically referred to visualising or picturing a score were coded as *visual imagery* to make this distinction. *Thinking through the piece* has the sense of imagery of the music unfolding in real time, as some participants explicitly stated; this undoubtedly involves audiation but may also be multi-modal. Some substatements made specific reference to *kinaesthetic or motor imagery*, or “imagining the movements” necessary for performance, or to *imagining the performance situation*. Other activities mentioned, though much less frequently, were: *thinking about* some aspect of the music or performance (which does not necessarily imply imagery); *analysis*; and *other actions* such as tapping out rhythms.

The Aims described for mental practice were exclusively performance-related, and included a mixture of practical and interpretational concerns. Some related to understanding the music (“…to internalise the music and to get to know it better,” F, 20 years old), some to *planning an approach/ interpretation*, and some to aspects of *physical execution* (e.g. “Thoughts on fingerings and dynamics”, M, 43 years old) or *problem solving* (e.g. “...to locate the musical passages that have some kind of difficulty at the rhythmic level, melodic, technical and mentally seek a solution”, F, 36 years old). A small number of people referred to *mental preparation* for performance (as distinct from aspects relating to realisation), and only one referred to increasing the *efficiency* of practice by using mental practice. While some participants gave quite specific descriptions of what mental practice involved, and seemed to have a clear idea of how they employed it, others primarily defined it in terms of what it didn’t involve, such as “practice that you do without your instrument” (F, 19 years old). Thus it seems that individuals may vary greatly in both their awareness and use of mental practice techniques.

The question *When carrying out mental practice, what information do you get from the score?* was answered by 57 participants. In this analysis, the 68 substatements were grouped into three superordinate categories: Level of Information (32), The Score in Relation to Performance Aims (26), and Imagery (5), in addition to five non-specific, unclassifiable answers (such as “As a conductor, everything. Hard to answer this question”, M, 44 years old) (see Table 3). Level of Information concerns what kind of information participants described obtaining from the score. The most frequent category here was *surface features and notational details*, for example, pitches, rhythms, and performance directions. Some participants referred to an *analytical understanding of structural features*, while others used the score more for *general characteristics* or an *overview* of the piece (for example “the feeling and emotion of the music” F, 21 years old, or “global vision of the work” M, 38 years old). A few participants aimed for a *thorough and detailed understanding* of all aspects of the score, while two specifically said they did not use the score at all.

TABLE 3 ABOUT HERE

Participants’ understanding of mental practice in the previous analysis revealed aims that were performance-oriented, and the analysis of this question revealed their relationship to the score in fulfilling those aims. A number of answers in the superordinate category The Score in Relation to Performance Aims contained reference to aspects of *execution and problem solving*, for example using the score to locate tricky passages, check one’s performance against directions in the score, or to find information that would help with ensemble co-ordination. Other functions included using the score for *memorization*, for establishing an *overall approach* to a piece, and for understanding the *context of one’s own part with others*. The category *structure in realisation* refers to working out how to project aspects of the work’s structure in performance (e.g. “moments of significance in the form of the piece that need to be related to the audience”, M, 59 years old). Imagery has much less prominence in this analysis, but *audiation* is mentioned four times, and *kinaesthetic imagery* once.

**Score Analysis**

Sixty-six participants out of 89 answered the question *What do you understand by the term ‘analysis of the score’?* and the analysis resulted in three superordinate categories, containing 183 substatements: Objects of Analysis (94), Definitions (53), and Aims (36) (Table 4).

TABLE 4 ABOUT HERE

The largest number of substatements fell into the superordinate category Objects of Analysis. The categories within this broadly comprised *structural* features and *aesthetic* features. Structural features were dominated by *tonality, harmony and melody*, and *overall form/structure*. Other aspects were *temporal* features such as metre and rhythm, and the *context of one’s own part with others*. Only two responses referred to *instrumentation*. Aesthetic features were overall less frequently mentioned but included *style*, *dynamics*, *expression marks and phrasing*, *word setting*, and the *wider context* of the composition.

The Definitions categories are those that explicitly define what score analysis entails. The most frequent type of definition given was that of *studying or analysing a score in detail* or breaking it down into constituent parts. Implying a less forensic approach, another set of substatements referred to *reading through or looking at* a score, sometimes as a precursor to a first playing of the piece in order to be warned of potential difficulties (see Aims). Less frequently, participants mentioned score analysis having a *theoretical focus*, or being for *general enquiry*. Two participants explicitly mentioned score analysis being carried out *away from their instrument*, and only one referred to *audiation*, while two respondents said they did not use the term and were unsure what it meant.

Specific Aims of score analysis were mentioned 36 times. *Realisation and interpretation* aims were mentioned the most frequently, including spotting difficult passages, addressing technical, balance or co-ordination issues, and looking for details or structural information that would aid interpretation. Other aims were to understand the *composer’s intentions or thought processes*, and to deepen one’s *understanding* of the musical text. Three people mentioned *memorization* as an aim of score analysis. Only one talked of aiming to explore their *own reactions* to the piece, and this may be significant in terms of its isolation, since realisation and interpretation were understood very much in terms of the best way to interpret the piece (according to the information in the score) rather than developing an individual interpretation.

Fifty-nine participants answered the question *When analysing the score, what information do you get from it?* with responses yielding 113 substatements. Table 5 shows the analysis summary and it is striking how similar the responses to this question are to the previous one. With the exception of two smaller categories, the Objects of Analysis (70) and Aims (24) superordinate categories contain the same categories as before, with frequencies in approximately the same proportions. In addition, 15 respondents simply gave a response to the effect of “see previous answer” and three answered “everything”. This implies that people’s understanding of score analysis is defined largely in terms of the information that is obtained from the score.

TABLE 5 ABOUT HERE

**Comparing mental practice and score analysis**

Score analysis is primarily about understanding the piece from the point of view of its structure (but also aesthetics) as gleaned from the score. It is thought of as theoretical but still relevant to realisation, interpretation and memorization. The large amount of overlap in participants’ answers to the two score analysis questions (understanding of the term and the information gained from the score) suggests that, for the majority of performers, score analysis is the information from the score. Mental practice, on the other hand, is exclusively related to performance preparation, but away from the instrument. Its defining characteristic is the use of several types of imagery. Specific aims include planning, problem solving, memorization, and efficiency, and these define a different relationship with the score in mental practice to that seen in score analysis. While score analysis requires the score, mental practice can take place with or without a score. There are clearly overlaps between score analysis and mental practice–both facilitate an understanding of the piece on a structural level as well as a performance realisation level, and each offers the possibility of different levels of engagement with the musical material. However, in mental practice the focus on performance preparation means the score can function additionally as an aid to memory, as an orientation guide (especially when one is working from a part), and as a point of reference for checking aspects of a developing interpretation.

**Discussion**

Performing musicians were surveyed as to their understanding of the terms *mental practice* and *score analysis*, and the information that they obtained from musical scores. The survey proved to be a rich source of qualitative data.

**Mental practice**

The three superordinate categories that emerged relating to mental practice were Characteristics, Activities, including mental imagery, and Aims for performance preparation. Its main characteristics related to its being carried out away from the instrument, taking place “in the mind”, and with or without the score. Some respondents were unsure what the term meant, perhaps reflecting the uncertainty and lack of consensus among music educators, music psychologists and those involved in sports and other performance-related areas. Some also situated the term within a wider context, for instance, one respondent defining it thus: “All the processes that lead to an interpretation. All the visual, audio and tactile processes. All the thoughts that occur about the work at the level of the conscious and subconscious mind.” (M, 48 years old).

The dominant activity reported for mental practice was imagery. Although the questionnaire asked how often respondents hear the music in their minds when reading a score (Brodsky et al., 2003; Fine & Bravo, 2011), the words *image* or *imagery* did not appear, yet multiple types of imagery were mentioned. The findings complement existing work demonstrating the links between imagery and mental practice (Clark et al., 2012; Clark & Williamon, 2012; Holmes, 2005; Lehmann, 1997) and suggest that imagery is a vital characteristic of mental practice. The types of imagery mentioned included audiation, visual imagery (imagining the score), and motor/kinaesthetic imagery (for instance, imagining fingerings). Broader, multimodal, aspects of imagery, including visualisation and imagining the performance situation, were of particular importance, and it might be that this type of multimodal imagery is central to mental practice. The usual tendency in psychology of separating modalities makes it hard to theorise about this type of imagery, which is perhaps one reason why our current vocabulary and understanding lack clarity and precision. Nonetheless, empirical work has demonstrated the existence and importance of such multimodal imagery. Motor imagery has been shown to disrupt the ability to imagine loudness changes in musicians, suggesting a form of audio-motor imagery coupling (Bailes, Bishop, Stevens, & Dean, 2012). Multimodal imagery has been shown to reduce anxiety and stress in elite tennis players (Coelho et al., 2012) and to be efficacious in healthcare (Rockefeller, Serlin, & Fox, 2007) but it has been less investigated in terms of mental practice for music performance. One exception to this is Keller (2012), who suggests that anticipatory auditory, visual and motor imagery may assist performers in planning and executing their movements, both when playing alone and with others to optimize ensemble coordination. Keller is, however, discussing imagery during performance rather than during mental practice, but there are likely to be strong similarities. While audiation–an often revered skill among musicians–did feature significantly, it did not appear to be dominant over other types of imagery, in particular the more holistic and multimodal ones.

Another feature of the imagery used in mental practice is that it is tied to the unfolding of music and its performance in real time, as previously demonstrated in mental chronometry research (Clark & Williamon, 2012). This quality was mentioned explicitly in the data as well as being implicit in phrases such as “thinking through” the music and visualising a performance, consistent with Clark et al. (2014) (see also Clark et al., 2012, p. 351). Their participants felt that visualising themselves playing an ideal performance helped them control performance anxiety and boost their confidence (Clark et al., 2012; Connolly & Williamon, 2004). In a similar vein, respondents in the study reported here mentioned mental preparation in connection with mental practice, such as “to imagine yourself in a certain situation and think how you might cope with it” (38 years old, sex not stated). Indeed, mental practice has been suggested as a way of minimising performance anxiety (Wilson & Roland, 2002), both in musical performance (Connolly & Williamon, 2004; Williamon, 2004) and in sport, for instance by elite athletes (Nicholls & Polman, 2007) and equestrian jumpers (Fischer, 1995). However, its use in music is still less well established than in sport.

Also in accordance with previous studies, there were multiple performance preparation aims revealed in relation to mental practice, including musical understanding, execution, interpretation, memorization, problem solving, mental preparation, and efficiency. For instance, in terms of execution, Bernardi and colleagues (Bernardi, De Buglio et al., 2013) have recently demonstrated that mental practice improved movement timing in expert pianists performing challenging music, although not as much as physical practice. Aspects that have received particular attention in the literature – efficiency (e.g. Reid, 2002) and memorization (e.g. Ginsborg, 2004) – did not feature strongly in our data. This is not to say that mental practice is not useful for these aspects, but for certain musicians and certain circumstances there may be other aims that are prioritised, and currently relatively little is known about the application of the full range of mental practice strategies in particular (as opposed to general) circumstances. Investigation of the more aesthetic and expressive applications of mental practice would be desirable, in order to establish the role of mental practice in creativity and interpretation. It should also be remembered that respondents were asked what they understood by the term *mental practice*, and not specifically about its aims and benefits in relation to performance preparation: this might explain the relative paucity of statements relating to such aims.

It was found that the score was used flexibly in mental practice. Use of the score was not always considered necessary, and mental practice encompassed a number of different relationships with the written material. An analytic stance towards musical structure could be taken, but equally, the score could be consulted for surface features of the notation. Some statements suggested using the score as an article for detailed study, or for a quick overview. It could be consulted for details to guide interpretation, or it could act as a reference to check for mistakes. For instrumentalists working from a part, a full score gave knowledge of the context of that part with others. But the category most often mentioned in relation to score use during mental practice was *execution and problem solving*, illustrating the importance of the score in relation to performance aims. The sense is that the relationship performing musicians have with the score in mental practice is shaped by their concurrent aims for performance preparation. As one respondent said: “it could be either just solely the notes–for memorization, or learning what other instruments (or the piano) are playing and how they interact” (M, 30 years old).

**Score analysis**

Performers must have structural insight into the piece of music they are learning for performance (Kopiez, 2002), and, at least for Western classical music, the score is the vehicle for learning about such structure, though in other cases a recording may suffice. Hill’s (2002) view is that studying the score is an important aspect of understanding the musical implications of the piece, in order “to liberate our musicality, to make sure that musical goals–not technical constraints–come first” (p. 143). The three superordinate categories that emerged relating to analysis of the score were Objects of analysis, Definitions, and Aims. Thus in interpreting the term, respondents considered, along with how score analysis might be defined, what information in the score was being analysed, and the purposes of doing such analysis.

The most numerous set of statements reflected the Objects of Analysis, most of which related to structural aspects of the music, such as form, harmony, melody and rhythm. For instance, one respondent discussed “Finding patterns of melody/harmony/form…” (M, 21 years old), and another gave a more specific response: “Studying the score in order to identify compositional, harmonic or other structure (e.g. tone rows and their inversions, retrogrades and retrograde inversions) and features such as canons, switches, repetitions, quasi-repetitions etc.” (F, 53 years old). If one of the main goals of musical performance is communicating the structure of the piece to the listener (see e.g. Berry, 1989; Cook, 1995; Rink, 2002), then an appreciation of structure at multiple levels from global to detailed (Cook, 1987; Howell, 1996; Williamon et al., 2002) is clearly essential to musical performance. This was borne out in the statements relating to objects of analysis. In addition to structural elements, aesthetic aspects were also of concern as objects of analysis, although they were mentioned considerably less often (18 times vs. 76 structural statements). Hence respondents were aware of using the score to obtain interpretive, stylistic information in order to assist their conceptual understanding of the piece and how it could be realised.

When respondents defined score analysis in terms of what it involves, they referred to a variety of processes. These ranged from studying and analysing the score in detail, to looking at it in a broader way. This ability to gain information from the score at a variety of levels reflects the importance of achieving a balance between local detail and a more global understanding (e.g. Cook, 1987; Williamon et al., 2002). Some statements talked about a wider context: “Looking at a musical score to get an overview of how parts fit together and to imagine the whole piece” (F, 44 years old), whereas others were more focused: “The detailed examination of a musical score undertaken in the expectation of finding deeper patterns than were initially evident”. (M, 29 years old). A minority of respondents felt that formal score analysis had a strong theoretical focus, and perhaps was not as useful for performance preparation as mental practice: “Apart from formal structural analysis, which is of limited practical use, analysis in practical terms involves reconstruction of the composer's thought process and the dramatic logic of text and music” (M, 58 years old).

This last citation talks not only about formal analysis, but also practical analysis, leading us to Aims, the final superordinate category relating to score analysis. Although score analysis might be seen by some as the domain of musicologists and student composers, performance related aims of score analysis were apparent in a subset of statements, due perhaps to all the respondents being music performers. These aims related mainly to the processes involved in preparing for a performance, and how the score may contribute to the performers’ realisation and interpretation of the piece. In particular, the use of formal structures may be one characteristic of effective practice (Chaffin et al., 2002). Moreover, performers usually rely on structures as a retrieval schema during performance, termed performance cues (Chaffin et al., 2002, Chaffin et al., 2010, Ginsborg et al., 2006), even if the piece has not been formally memorized. Vaughan (2002) demonstrated the importance of music analysis to aid memorization. Expressive choices made by performers will tend to reflect the performer’s understanding of music, in particular the musical structure (Clarke, 2002). Narmour (1988) suggests that music analysis should enable performers to discover how different interpretations affect listeners’ perceptions and understanding of musical works. Music analysis aims to provide an understanding of musical styles, and comprehending stylistic differences is important to performers, as it affects technical options such as bowing and fingering (White, 1994, Provost, 1994). This may relate to an understanding of the composer’s intention: “…perhaps considering what the goals of the composer may have been” (F, 21 years old). According to Juslin (2003), musical interpretation is influenced by both internal and external factors, and he mentions composer’s intention as one such external factor. These aims suggest that there is more to the score than merely the notes contained within it (Hill, 2002).

Interestingly, only one respondent explicitly mentioned audiation: “…imagining the sound of the music…” (M, 30 years old). This may appear surprising, as audiation has been shown to occur when score reading – what Brodsky terms *notational audiation* (Brodsky et al., 2003; Brodsky, Kessler, Rubinstein, Ginsborg, & Henik, 2008; Fine et al., 2006), and the majority of the present group of respondents stated that they usually or always heard music when reading scores (Fine & Bravo, 2011). However, score analysis is not the same as score reading, and it is clear that audiation is not such an important aspect of performers’ understanding of score analysis, or at least not foremost in musicians’ definition of the term.

**The relationship between mental practice and score analysis**

The questionnaire asked musicians about both mental practice and score analysis as separate entities. The results of the qualitative analyses point to a relationship between them, with both similarities and differences. The main similarity is that both are clearly considered beneficial for performance preparation in terms of improving musical understanding over time. Performers use both mental practice and score analysis to hone their technical, expressive and interpretive skills during the learning stages in preparation for final polished performance (Sloboda, 1985). Both have a role in the development and manipulation of mental representations, and this is essential for performance (Keller, 2012; Lehmann, 1997; Lehmann & Davidson, 2002,).

The main distinction between mental practice and score analysis concerns their aims. Score analysis is primarily used to understand the music in terms of its structural components and to gain an insight into its organisation and perhaps how it fits into a wider context. Mental practice, on the other hand, is focused much more on performance related aims and mental imagery (Clark et al., 2012; Holmes, 2005). Indeed, it is questionable whether musicians can do mental practice without involving imagery of some sort–Clark and Williamon (2012) suggest they may be different terms for the same thing–and the respondents’ statements reflected the established relationship between mental practice and imagery.

Although neither requires the presence of the instrument, being away from the instrument was very often mentioned for mental practice, but rarely for score analysis. This appears slightly at odds with the findings of Clark and Williamon’s (2012) study investigating methods of assessing imagery in musicians, in that, after *mental imagery*, *score study away from the instrument* was the second most common mental practice strategy used when learning a piece for performance. However, this might reflect people’s assumptions about the words *practice* and *analysis*, in that, for most performers, practice normally takes place at the instrument. Hence some respondents felt a need to mention the instrument’s absence explicitly when considering mental practice, whereas this was not felt necessary when defining score analysis. Similarly, although the presence of the score is implicit in score analysis, the score was not felt important for mental practice: indeed, some respondents stated that they did not use it and found it nonsensical to be asked what information they gleaned from a musical score during mental practice. On the other hand, asking respondents what they understood by score analysis, and what information they obtained from the score when doing so, led to very similar responses: to an extent, score analysis is the score and is defined in terms of the objects of analysis inherent in it.

One issue may be that score analysis and mental practice are being treated, both in the present survey and in much of the literature, as separate entities, and rarely researched in tandem. Perhaps it would be more sensible to consider them as lying on a continuum of strategies for performance preparation and enhancement. Hence mental practice and score analysis can be seen as complementary to one another, as opposed to being either/or. Both involve a range of strategies, some of which overlap, and which can be employed flexibly. Individual performers may differ in where they primarily fall on such a continuum, tending to use score analysis (Hultberg, 2008) and/or mental practice to a greater or lesser extent.

People vary in their conscious use of mental practice and score analysis, with some respondents providing detailed responses to the questions and outlining multiple aspects to both, whereas some, for instance, stated merely that mental practice was “practice away from the instrument”, considering it in terms of what it was not. These individual differences in the level of response detail might reflect a different level of awareness and/or conscious use of both mental practice and score analysis. For instance, Keller (2012) suggests that individual differences in the ability to use anticipatory imagery in performance may explain differences in expressivity and ensemble cohesiveness. Thus it may be beneficial to fully articulate mental practice and score analysis as a range of strategies that may be purposely employed in solving musical problems and preparing for performance. Any lack of awareness or conscious use of these strategies suggests a role for education. The use of mental skills training (Clark & Williamon, 2011; Connolly & Williamon, 2004; Williamon, 2004) and score analysis in instrumental lessons (Mawer 1999, 2003) has already been documented and it should be seen as a long term commitment (Connolly & Williamon, 2004; Provost, 1992). Score analysis may be somewhat easier to teach, since it is a formal and rational subject adapting itself well to an educational setting, while mental practice requires a more personal commitment and perhaps a natural propensity. The fact that score analysis seems still to be more commonplace in musical pedagogy, despite the rather more recent use of mental skills training, may suggest a disconnect between the areas of focus within musicians’ training and the skills they use once in the profession, but addressing this question is beyond the scope of this article.

**Limitations and future research**

This was an exploratory survey, and there were a number of limitations. Although the sample was of a reasonable size and encompassed a broad range of instrumental expertise, there was a bias towards classical musicians. It could be argued that the musical score does not have such importance in other genres, such as pop, folk, and jazz, and also in various world musics, and hence score analysis may be less relevant to such genres. It might be the case, though, that asking non-classical performers about ‘analysis’ rather than score analysis would yield useful data in terms of the relationship between analysis (of whatever type) and mental practice. However, mental practice may be just as useful to performers in these genres, so it would be interesting to question such groups as to their understanding of the term and use of mental practice strategies. One study on jazz pianists showed that the relative efficacy of mental and physical practice for learning tonal patterns depends on the difficulty of the musical figure (Cahn, 2008), but fewer other studies have investigated the role of mental practice in non-classical genres. A few respondents stated that the question asking what information was available from the score during mental practice was hard to interpret, as it implied that a score was used. This question was included for consistency with questions on score analysis, and it did enable us to establish the relationship between mental practice and the score.

One interesting question raised by our survey is whether there are any differences in the understanding and use of mental practice and score analysis in different groups of musicians, specifically conductors and singers. For example, all private practice undertaken by conductors may be said to be mental practice away from their “instrument” (the orchestra), and the score is of the utmost importance to them (Meier, 2010), while singers, by contrast, carry their instrument within them. It has been previously noted that auditory imagery and motor imagery appear to be particularly closely linked (Holmes, 2005), especially for singers, whose physical production of music is very much internalised compared to other instrumentalists (Fine et al., 2006). Battisti (2007) emphasises the importance for conductors of reading through scores in real time, audiating the music, as well as analysing the scores formally, in preparation for performances. Thus, for conductors at least, the lines between mental practice and score reading and analysis are blurred. The present sample did not contain enough conductors to consider them as a separate group, but future studies could perhaps focus on conductors, or on singers, and obtain richer data through interview. Also, many respondents played multiple instruments (including singing and conducting), and thus comparisons between a melody instrument group (e.g. flautists) and a harmony instrument group (e.g. pianists) will be confused by those who play both (and possibly other) instruments, and who have thus developed a range of instrument-specific mental practice or score reading skills.

Another pertinent question is whether the use of mental practice and/or score analysis changes as a function of experience. The respondents self-rated as professional, semi-professional or amateur, but there were no criteria provided for these terms, and there were few who rated themselves as amateurs. Future research could compare different levels of musician, with experience defined by stricter criteria, but the present research was aimed at polling the general musical population, rather than investigating experience-related differences. There is some suggestion in the data that the ways in which people relate to a score may depend on both their definition of the activity (e.g. analysis versus mental practice) and their aims at any one time (e.g. to gain a quick first overview of a piece before playing for the first time versus developing a performance interpretation) and this would be an interesting avenue for future research.

Overall, then, our sample of musical performers provided a broad range of definitions of both mental practice and score analysis. Definitions for mental practice emphasised mental imagery, its occurrence away from the instrument, and its focus on performance preparation, particularly for execution and realisation. Score analysis definitions focused primarily on the objects of analysis themselves, as well as its aims in terms of performance preparation at a range of levels from detailed to exploratory. Both involve a range of strategies and may assist the development and manipulation of mental representations on various levels in preparation for musical performance. Most importantly, there were clear similarities and differences between mental practice and score analysis, and it may be better to think of them as existing on a continuum rather than as separate entities. A challenge for future research is to construct a theoretical model to conceptualise this continuum and explain their relationship, relating both to the development of performance expertise. There is also scope for future research to elaborate on the strategies used and the specific purposes they serve, in order to facilitate the learning and teaching of such practice strategies, which are often hidden from view. This interdisciplinary exchange among music psychology, music education and musicology will hopefully clarify and strengthen the roles that both mental practice and score analysis have in enhancing interpretive performance excellence.

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**Appendix A – Questionnaire**

1. Gender (male/female):
2. Age (years):
3. What instruments do you play (including conductor/singer)? For each, please also say how many years you have studied this instrument.
4. How experienced are you as a musical performer (professional/semi-professional/amateur)?
5. What kind of repertoire/musical style do you usually perform?
6. What do you understand by the term ‘mental practice’?
7. What do you understand by the term ‘analysis of the score’?
8. Do you do any mental practice or analysis of the score away from the instrument (or choir/orchestra, if conductor): yes/no
9. How useful do you find doing ‘mental practice’ with the score away from the instrument or other performers?
10. At which stage of your musical training did you do this mental practice? Please tick all that apply:
    1. When first learning an instrument
    2. When becoming proficient on an instrument
    3. When you have become an expert performer
    4. It is a continuous process
    5. Other (please specify)
11. When doing mental practice, what information do you get from the score?
12. In which stage(s) of the learning/performance process of a new score do you find mental practice with the score useful?
    1. Sight-reading the score for the first time
    2. Exploring and getting to know the music
    3. Becoming fully familiar with the piece
    4. Playing the whole piece fluently and musically
    5. Memorizing the piece
    6. Trial performances
    7. Other (please specify)
13. When you read the score away from the instrument or other performers, how often do you re-hear the music in your mind?
    1. Always
    2. Frequently
    3. Occasionally
    4. Rarely
    5. Never
14. Have you been trained in analysis (music degree or similar)?
15. How useful do you find analysing the score away from the instrument or other performers?
16. At which stage of your musical training did you analyse scores when learning pieces of music? Please tick all that apply:
    1. When first learning an instrument
    2. When becoming proficient on an instrument
    3. When you have become an expert performer
    4. It is a continuous process
    5. Other (please specify)
17. When analysing a score, what information do you get from it?
18. In which stage(s) of the learning/performance process of a new score do you find analysing the score useful?
    1. Sight-reading the score for the first time
    2. Exploring and getting to know the music
    3. Becoming fully familiar with the piece
    4. Playing the whole piece fluently and musically
    5. Memorizing the piece
    6. Trial performances
    7. Other (please specify)

Table 1

Instrumental Breakdown by Number of Respondents (n), Indicating the Most Popular Instruments in Each Group.

|  |  |  |  |
| --- | --- | --- | --- |
| Instrumental group | n | Specific instrument | n |
| Keyboard | 57 | Piano | 57 |
| Woodwind | 43 | Flute and piccolo | 17 |
| Voice/singing | 34 |  |  |
| Strings | 31 | Violin/guitar | 10 each |
| Conducting | 19 |  |  |
| Brass | 13 |  |  |
| Total | 203 |  |  |

*Note*: Some participants played up to 4 instruments.

Table 2

Categories of Responses Relating to Respondents’ Understanding of the Term *Mental Practice*

|  |  |
| --- | --- |
| Superordinate categories | Specific categories and subcategories |
| Characteristics (73) | Away from one’s instrument (33 + 19\*)  In the mind (15)  Use of score (14)   * Without (3) * With/either (11 +1\*\*)   Holistic/wider definitions (8)  Uncertainty about term (3) |
| Activities (61) | Mental imagery (54)   * Audiation (15) * Visualisation/Imagining playing/practising (15) * Kinaesthetic/movement (10) * Thinking through the piece (9) * Visual imagery (3) * Performance situation (2)   Thinking about (3)  Actions (2)  Analysis (2) |
| Aims for performance preparation (28) | Musical understanding/knowledge (7)  Physical execution/technique (5)  Planning approach/interpretation (4)  Memorization (3)  Problem solving (3)  Mental preparation (3)  General performance preparation (2)  Efficiency (1) |

*Note*. Numbers of substatements in each category are shown in parentheses.

\*19 responses implied “away from the instrument” without actually saying it explicitly. The substatements from these 19 have been accounted for elsewhere.

\*\* 1 response implied “with the score” without actually saying it explicitly. This substatement has been accounted for elsewhere.

Table 3

Categories of Responses Relating to Information Respondents Obtained from the Score During Mental Practice

|  |  |
| --- | --- |
| Superordinate categories | Specific categories |
| Level of information (32) | Surface features, notational details (10)  Analytical understanding of structure (8)  General characteristics/overview (7)  Use of score (with/without) (4)  Thorough knowledge (3) |
| The score in relation to performance aims (26) | Execution, problem solving (13)  Context of own part with others (4)  Memorization (3)  Overall approach (2)  Structure in realisation (2)  Wider context (2) |
| Imagery (5) | Audiation (4)  Kinaesthetic/movement (1) |
| Other (5) | Non-specific answers (5) |

*Note*. Numbers of substatements in each category are shown in parentheses.

Table 4

Categories of Responses Relating to Respondents’ Understanding of the Term *Score Analysis*

|  |  |
| --- | --- |
| Superordinate categories | Specific categories and subcategories |
| Objects of analysis (94) | Structural (76)   * Tonality, harmony, melody (34) * Overall form/structure (24) * Time, rhythm (10) * Context of own part with others (6) * Orchestration/instrumentation (2)   Aesthetic (18)   * Style (4) * Wider context (4) * Dynamics (4) * Expression marks, phrasing (3) * Text, word setting (3) |
| Definitions (53) | Study/analyse in detail (29)  Read through/Look at (12)  Theoretical focus (4)  General enquiry (3)  Away from instrument (2)  Uncertainty about term (2)  Audiation (1) |
| Aims (36) | Realisation and interpretation (15)  Composer’s intentions/process (9)  Understanding (8)  Memorization (3)  Exploring own reactions (1) |

*Note*. Numbers of substatements in each category are shown in parentheses.

Table 5

Categories of Responses Relating to Information Respondents Obtained from the Score During Score Analysis

|  |  |
| --- | --- |
| Superordinate categories | Specific categories and subcategories |
| Objects of analysis (70) | Structural (59)   * Tonality, harmony, melody (25) * Overall form/structure (20) * Time, rhythm (8) * Context of own part with others (5) * Orchestration/instrumentation (1)   Aesthetic (11)   * Expression marks, phrasing (4) * Style (3) * Wider context (3) * Dynamics (1) |
| Aims (24) | Realisation and interpretation (19)  Memorization (2)  Composer’s intentions/process (2)  Understanding (1) |
| General answers (19) | Same as “Analysis of the score” definition (12)  Same as “Mental practice” answer (3)  Everything (3)  Uncertainty about question (1) |

*Note*. Numbers of substatements in each category are shown in parentheses.

Footnote 1

1. A Google Scholar search on 7 April 2014 yielded 315 articles published since 2000 with the term ‘mental practice’ in the title, with a further 45 articles with the term ‘mental rehearsal’ in the title. For the sake of consistency we only use the term ‘mental practice’. [↑](#endnote-ref-1)