Critical Review - An Evaluation of Psychological Studies On Sight Reading Ability in Pianists

My study is based on my perceptions of the ability to sight read, and the extent to which it can vary in classical pianists. I have drawn on my experiences at university and Music College, and interviews with pianists – fellow students, teachers and professional accompanists at Trinity Laban. I also reviewed studies by psychologists and musicians, starting with several by A.C. Lehman and K.A Ericsson. I worked backwards from the 1996 journal 'Performance Without Preparation: Structure and Acquisition of Expert Sight-Reading and Accompanying Performance', which is a continuation of research carried out by the pair in 1993 – 'Sight-reading ability of expert pianists in the context of piano accompanying'. In fact Lehman and Ericsson have studied the psychology of piano performance in great detail, with numerous journals on memorisation and performance standards. They conducted tests upon a range of pianists, changing variables to determine how the brain processes the information on the score, how it relies on certain conditions and reacts to problems. The extensive profiling carried out before the test provided some interesting and sometimes unexpected results regarding practise habits, specialisation and experience.

However the research didn't explore the complex brain activity that is going on in expert sight reading, activity that is removed enough from musical abilities that a virtuoso pianist can struggle reading through a score that a mediocre pianist would have no trouble with. (Wolf, 1976, cited in Parncutt & McPherson, 2002, p142)

I was then led to the writings of Dr J.A. Sloboda in the 'The Musical Mind: The

Cognitive Psychology of Music' (1985), which contains perhaps the most authoritative explanation of the inner workings of sight reading that I encountered. Sloboda, aware of the limited existing research, used studies carried out on reading language as a starting point, and which exhibits strong parallels with music reading. This provided perhaps the most compelling conclusions in terms of the brain's response to processing information that it can successfully encode into recognisable structures.

I considered the responsibilities we have as teachers, to enable the next generation of pianists to become fluent readers, and found writings by pedagogues Chad Twedt, Dianne Hardy and Laura Beauchamp on the subject. These articles were concerned with the different types of memory and practise employed depending on the kind of performance prepared, and with the general absence of a foundation in sight reading in teaching materials.

My own aims, in analysing the existing literature, were to come up with a legitimate explanation for the differences in sight reading ability in pianists of similar technical/music ability. I also wished to explore the mental processes behind fluent reading, and draw on the findings of psychological studies to improve my own technique.

For a long time I have been aware that certain pianists, irrespective of their technical ability or musicality, when presented with a score they had not seen or had the chance to study beforehand, could perform a competent reading of the music. When asked how they are able to take in and process so much information instantaneously – two musical staves, huge torrents of notes, polyphonic textures, markings indicating tempo, phrasing, key signature, articulations, dynamics and expression – they cannot offer an obvious answers. One former teacher compared

it to reading aloud, something most people are able to do naturally without a great deal of mental effort. But I was not convinced by this explanation, as the complexity of piano music make it more akin to reading several sentences simultaneously, at a suggested dynamic, speed and expression. Surely impossible! Sloboda (1985, p68) notes that 'enormous educational effort is expended on getting children to a state in which their language reading is reasonably fluent.' which is simply not the case with nurturing music reading. Furthermore, the skill of reading music must be learnt alongside the actual process of learning an instrument, to which it often plays a subsidiary role.

Others pianists, and I include myself in this category, are unable to perform music, beyond a certain level of difficulty, without having the chance to first study the score. Whilst we progress to ever more difficult repertoire, and our technique and musicality improves, we are still left helpless when presented with new music for the first time. I also found that certain styles of music, such as Baroque or early Classical present more of a challenge then others, such as Romantic and early 20th Century. It is hard to determine whether this supports the theory that experience and familiarity in certain styles increases sight reading ability, or whether it is style of the earlier music, with its contrapuntal lines, that are naturally making it more difficult to process. I do, however, have more of an affinity for playing from memory – in fact, it is often the case that pianists are either strong at sight reading or memorisation. The reasons for this are identified in the following table, devised by pedagogue and music writer Chad Twedt (2009) – in terms of pianists' approach to practise, and the type of memory used.

	Fast sight-reading	**Slow sight-reading lends itself to…**

	lends itself to…		
Practice Efficiency	**Quantity**	…processing large amounts of music at a time since so little difficulty in physical execution is encountered and since it is so pleasurable to hear music played from beginning to end. This does little to advance memorizing skills. **The good sight-reader becomes a better sight-reader.**	…processing small amounts of music at a time since each note is such a burden to read and it can take so long to read even one page of music. This does little to advance sight-reading skills. **The good memorizer becomes a better memorizer.**
	Repetition	…little (if any) repetition in practicing, since large sections of music are being played. If repetition does occur, a lot of time lapses between repetitions, making the repetitions minimally useful.	…a lot of repetition in practicing, since small quantities of music are being played. Repetitions are productive since very little time lapses between the repetitions.
	Speed	…practice tempos that are fast, making it more difficult to detect mistakes and to fix them once detected.	…practice tempos that are slow, making it easier to detect mistakes and to fix them once detected.
Memory Development	**Audio Memory**	… development of what the piece sounds like on a macro level, developing a “big picture” for the music quickly.	…development of what the piece sounds like on a micro level, developing a “big picture” for the piece later.
	Analytical	…more analysis of music	…less analysis of

	Memory	(*indirectly!*). Fast sight-readers may have less time to think about each note they play than slow sight-readers, but their experience causes them to analyse music as they go, such as seeing scales, intervals and chords instead of "just notes".	music (*indirectly!*). Slow sight-readers have more time to think about each note they play than fast sight-readers, but they lack the experience/knowledge to see intervals, chords and scales in the music instead of "just notes".
	Kinaesthetic Memory	…slower development of "muscle memory" (because of practice inefficiency tendencies above)	…faster development of "muscle memory" (because of practice efficiency tendencies above)
	Visual Memory	**…development of visual memory of the score since good sight-readers hate looking at their hands**	**…development of visual memory of their hands since good memorizers hate looking at the music**

According to Twedt, the differences between pianists' practise approach means that good readers become better at sight reading without improving their memory, whilst slow readers improve their memorisation without helping their reading. The learning curve and time required to develop a new ability means that pianists are unlikely to change their practise habits to improve the weakness in their skill-set. With both memorisation and sight reading there seems to be an absence of specific teaching methods. Of course it is possible to be good at both, and is something that any professional pianist should strive towards. But the disposition of pianists towards one discipline or another is a problem which has generally not been addressed in teaching methods.

I then focused on the role of sight reading in pedagogy. I did wonder if sight reading is a natural talent, in the same way that some musicians are born with perfect pitch, or a skill that is learnt over years of dedicated practise, or as is most likely, a combination of the two. However, bearing in mind the idea that sight reading could be a partly innate skill, I explored the comparison with perfect pitch. Research (Deutsch, 1999, p 265) shows that relative pitch, the ability to identify a note, in terms of its intervallic distance from another named note, can be developed to such an advanced level that it is almost indistinguishable from perfect pitch. Perhaps the skill of playing music at first sight can be similarly taught and honed. With the efficiency, musical benefits and employment opportunities available to those who can sight read, surely it should be considered as important a part of pedagogy as scales to technique, or harmony to musicality. However, in my experience, and that of others, it has never been a fundamental part of our musical education.

As part of my research amongst fellow pianists at college, I asked, in interviews conducted over email, a set of questions, including - Do you feel that sight reading should form a stronger part of pedagogy, beyond the sight reading tests we take in our graded examinations? (Full transcripts are available on request). One respondent felt:

'I think it's taught badly. I'm only learning in the last few months about what to look for, how to get through something in passable fashion. Or maybe as a child I was just too daunted by the idea of a sight reading 'test'. Sight reading is just reading music you haven't seen before and playing it at the same time. But it's got a stigma attached to it because it's not made particularly accessible or particularly fun for young beginners.'

Some of the people interviewed remarked that they were only offered sight reading exercises regularly in the past, when they had to prepare for graded exams, which were always daunting experiences. Several pianists suggested that they were not sure of the best way of improving the sight reading of their own students. Research in 1992 by music professor Dr Dianne Hardy further substantiates the idea that there is a deficiency of sight reading development in piano teaching, and little seems to have changed in the intervening years. In a poll of 221 Music Teachers National Association (MTNA) teachers, 13% considered it the most important skill for pianists, 73% rated it highly important and the remainder considered it fairly important. However, only 7% of the teachers surveyed said that they addressed sight reading systematically in their lessons. (Cited online)

One explanation for this is the slightly unhealthy focus on developing technique and building a strong repertoire over time, at the expense of reading ability, for the purpose of a few recitals and auditions. This is compatible with the development of pianists in intensive study, but less useful for the freelance/portfolio career we will often enter later, where large amounts of varied repertoire must be rehearsed and performed with little time to memorise or internalise the music. In my interview, I also asked - Do you practise sight reading at all? If yes, how often? If no, why not? One student responded as follows, which is sure to be universally felt amongst pianists who neglect their sight reading:

'I would love to practice more sight reading, because I am completely rubbish at it and I think it would help me hugely if I could just practice it regularly. Yet the college schedule is so busy and 99% of performance assessments require me to perform music

that I have learnt from a score correctly and with as much musicality as I can. Therefore that's what I have to do most of the time: learning the music properly from the score and trying my best to make it sound musical enough to call it my own interpretation…No time for sight reading!'

Hardy, writing in 1998, noted the important differences between rehearsing memorised repertoire, and reading through a new piece of music – adopting the same approach for each is particularly counter intuitive for sight reading:

'The practice of correcting errors and rehearsing sections of a piece leads to perfection when performing but proves disastrous when sight-reading because the process of practicing repertoire and that of sight-reading are separate and success in one does not lead to success in the other.' (Cited online)

Indeed, the two are entirely different processes, but this is not always observed by teachers, which is perhaps why students are so prone to stopping themselves and correcting mistakes when reading a piece for the first time. They have trained themselves to identify and fix errors in their repertoire, and cannot help but respond in the same manner when sight reading. Hardy later notes the culture of assigning progressively harder music, without checking first the student's ability to read through music of a similar standard to the piece that they have just mastered. This has a positive effect on technique but neglects the important skill of sight reading.

Beauchamp (1999) establishes five points for improving score reading – knowledge and fluency in the bass and treble clef, security in various five finger

positions, confidence with the layout of the piano without needing to look at the hands, competence in common accompaniments such as Alberti bass and broken chords, and understanding of basic fingering principles. I am not convinced that this is a comprehensive method for overcoming sight reading problems, as I considered myself competent in these areas, but still unable to read through scores of any complexity. In fact, Lehman and Ericsson (1996, p.34) found, in controlled tests, that 70% of sight reading errors are rhythmic.

In my own experience, although I have no problems playing challenging rhythms if they have been studied beforehand, I am confounded in sight reading by all but the most basic rhythms. Again, this can probably be attributed to a lack of thorough training in this area beyond the early stage. Pianists, focusing on refining their small and memorised repertoire, are rarely faced with interpretations of rhythm in the same way that orchestral musicians are. The people who I interviewed generally held the view, that correct rhythm, and a strong sense of pulse, is one of the most important factors in sight reading convincingly. Unfortunately it is also one of the more difficult, because of the aforementioned practise of stopping to correct errors, and thus breaking the pulse, and the lack of incentive to develop this ability, which presents a considerable learning curve, alongside our more 'comfortable' practise habits.

Alongside rhythm, I thought of other areas through which sight reading can be improved, based on my own experience and on existing research. Importantly - a thorough knowledge of the geography of the keyboard, improvisational ability and knowledge of harmony. Sloboda refers to pianists perceiving the structure of the score at several levels, with better sight readers able to group notes into

phrasings/shapes that they recognise, which they can then realise the harmonic rhythm of the piece. Studies (Sloboda, 1985, p.80) show that musicians, even at an early stage of training, are able to retain more information from a score, because they are using both visual memory and a musical conception, whereas non-musicians can only recall the visual patterns. The pianists that I interviewed agreed with my own assertions, adding that knowledge and experience are invaluable in building a strong sight reading technique. Important also, in the first reading of piece is a consistent pulse, regardless of mistakes, and a defined sense of the musical style. This is corroborated by the pianists I interviewed, whether they consider themselves good or poor sight readers, and is a thoroughly different approach to the tentative initial learning stages of a new repertoire piece.

Much has been written already about hand eye span – being the distance between the notes that the eyes are reading, and those that the fingers are playing. Expert sight readers are usually reading up to seven notes of the music as it happens (Sloboda, 1985, p 72). However, Sloboda astutely remarks that whilst the question of 'what makes a good sight reader?' can easily be answered with a range of valid responses, it does not necessarily lead to solutions to the question of what a poor reader must do to become fluent. In the instance of hand eye movement:

'The finding that fluent readers typically look further ahead than poor readers does not automatically yield the prescription that poor readers should practise looking further ahead. It may well be that increased ability for preview is the result of some other skill, such as the ability to detect pattern or structure in the score, and that simply trying to look ahead will not improve *this* skill'

(Sloboda, 1985, pp68-69)

More than any other study, this seems to sum up the problem with teaching and acquiring fluent reading ability. There are complex techniques at work, which may not always relate directly to a particular problem, but are based more on our musical memory and processing of information.

Sloboda continues to offer ideas as to the abilities of good sight readers, based on an area that has received considerable more research, but is consistent with the principles of this study – language reading. He also makes the feats of certain sight readers easier to understand, as similar tricks are employed by the brain in reading text, but more universally. For example, we digest text as words, and groupings of words, rather than processing individual letters. Tests (Shaffer, 1976, cited in Sloboda, p.71) show that copy-typists work up to five times slower when they are working with words in which the letter order has been scrambled, as they were unable to process the information in terms of words which were familiar to them. The speed at which we perceive the written word seems like quite a prosaic skill, but it is not dissimilar to the technique that allows strong music readers to play with fluency in an unrehearsed performance.

Further tests (O'Regan, 1979, cited in Sloboda, p.69) show how our eyes skip over very common words like 'the', with a combination of linguistic knowledge and peripheral information allowing us to identify the word without the need for direct fixation. Sloboda points out that theoretically, there is no limit to musical patterns, whereas there are a finite number of words in the English language. But scales,

arpeggios, chord voicings/harmonic progressions, conventional rhythms and many other features will recur in the language of music, and fluent sight readers will be able to identify and perform these instantaneously, much like how the eye will unconsciously skip common words in this sentence whilst the brain is still able to create the full narrative.

Sloboda's findings clarified some of the ways that the brain can process information quickly, and how expert sight readers are able to apply this to instantaneous interpretation of music. But my question - 'Do you regularly practise sight reading? - provoked a range of different responses, and didn't entirely correlate between accomplished and poor sight readers. It is often recommended that we practise reading through unfamiliar repertoire every day, but I was sure there were more adaptable and sophisticated ways of improving score reading. I decided to investigate the kinds of piano specialism that could potentially advance the ability to play at sight.

I was led to the detailed studies carried out by Lehman and Ericsson (1996). They note the general air of mystery associated with acquiring expert sight reading ability - "Theories arguing that specific skills are acquired through extended practice cannot easily account for some musicians' ability to perform unfamiliar music without preparation at first sight (sight-reading)." (p.1)

They also cite Bean (1938), whose thoughts are still pertinent today - "successful learning of the skill of efficient reading seems to involve a trick of which neither teacher nor pupil is conscious" In tests, significant differences were found in the sight reading ability of professional accompanists and pianists studying solo

performance degrees, showing that the type of music played and the method in which it is practised effects reading ability. But they also found a wide range of sight reading level between solo pianists of a similar advanced level. This led Lehman and Ericsson to carry out further studies.

The 1996 study offered a more in-depth look into the demands and skills required of sight reading, compared to the performance of rehearsed music. Tests were carried out on 16 pianists, of comparable talent, but ranging from accompanists, coaches, graduate assistants to solo performers. To profile the musicians further, they were interviewed to find out about their solo and accompaniment repertoire, hours of practise and accompaniment activities, and number of performances.

Lehman and Ericsson ultimately conclude with the assertion that the amount of practise or experience alone is unlikely to have caused the considerable differences in sight reading ability amongst expert pianists – 'Given that sight-reading performance by definition precludes the opportunity to practice the performed music, it is not immediately obvious how practice and experience could possibly explain stable individual differences in that performance.' Instead, they draw upon the collected data regarding musical activities outside solo performance. The analysis showed a significant correlation between sight reading, and accompanying experience/amount of accompaniment repertoire. This is somewhat to be expected, and supports the assertions of Twedt – suggesting that the type of practise and memory used for memorisation of solo repertoire versus accompaniment makes memorisers and sight reader better, and vice versa.

But Lehman and Ericsson were also able to conclude that age, amount of practise, and even training specialisation, whether in accompaniment or solo performance, were less significant. They claim that 'accompanists are not a group of self-selected pianists possessing innate predispositions that make them superior to other pianists in sight-reading.' (p.22). It is perhaps more important that pianists, regardless of their specialisation, work with a range of singers, duos and ensembles, with a wide repertoire, to improve their sight reading.

I can draw my own conclusions from the findings. Although I am not entirely convinced that these factors – relating to accompaniment experience – are a sole determinant of sight reading ability, I can see the obvious benefits of working in this area. Performing with other musicians can help you to increase your own repertoire beyond your comfort zone, it can improve your aural skills, and forces the pianist not to adopt the dreaded 'stop and correct mistakes' approach when reading through a new piece, as they have another musician to contend with. Finally - Lehman and Ericsson found that it is perhaps more important to build up a variety of accompaniment repertoire alongside your solo studies then to specifically focus on it. I can relate to this, having worked with singers and instrumentalists at Trinity Laban alongside my solo piano repertoire. Whilst it creates added pressure, as there is simply too little time to practise until the music is semi-memorised, it means that my brain is forced to fully read the music off the score in rehearsals and concerts, rather than having the score as a point of reference. I was probably relying more on muscle memory a few years ago, whereas now, with my understanding of the structural conception needed when reading through the score, I use visual memory, and my knowledge of harmony and compositional constructs, to guide me through the music. Consequentially, as my reading ability -

of repertoire that is learnt but by no means memorised – improves, so my reading of music for the first time starts to show some progress.

To truly develop my score reading, to a level where I could confidently accompany singers or instrumentalists on the majority of repertoire, or play through a new piece assigned for a student, I feel I would have to work at it intensively, with much less of my practise dedicated towards repertoire, memorisation and technique. However, the development of the 'recital pianist' at conservatoires means that unconfident sight readers have little time to work on this gap in their technique. Many accept that they are unable to improve their sight reading beyond a certain level, while it is actually the musically nourishing but counter-intuitive practise of concert repertoire exclusively that is inhibiting them. These conclusions are very much theoretical, and have not been studied – perhaps the practise of sight reading alone could only cause marginal improvements. Previous attempts at reading through Mozart sonatas daily merely had the effect of leaving me exhausted and frustrated! But perhaps a more developmental approach, starting with the simplest repertoire and only moving on when it can be played almost effortlessly, would allow some progress. It seems highly likely, as with piano training itself, that reading at sight is something that can be developed to a high level at a younger age, but because of the lack of structured sight reading teaching materials, it is usually something that exceptional children can only discover and hone for themselves. Undoubtedly sight reading is one of the mysteries of pedagogy, and in spite of the research carried out by music psychologists over the years, seems to have remained so. But my own research into the aforementioned articles has given me a powerful insight into the technique, and leaves me confident that I can improve it with the correct practise ethic and

study of the complex processes at work.

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