

A STUDY ON HOW RELAXED TECHNICAL APPROACHES AFFECT PERCEIVED TENSION AND PERFORMANCE IN PIANISTS

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Abstract

The pianoforte is one of the most popular musical instruments that has attracted by any individuals at any age in any part of the world. Much of the music that had been composed for various keyboard instruments in different periods of history is often performed in the present-day acoustic piano. As a result, many music students who enroll in piano study are regularly at risk of acquiring poor technical approaches at the keyboard, which often leads to physical tension, continuous pain, injuries and a slower rate of progress. Therefore, this pilot study explored relaxed technical concepts which may help pianists to be more efficient technically in their performances. The purpose of this research study was to examine how the application of an appropriate technical concept to a technically challenging extract of a piece of music affects the perceived physical tension of piano students. It also sought to determine whether the implementation of physically relaxed approaches aids in diminishing physical tension and increasing the performance level of piano students. 26 undergraduates studying piano at the University of Visual and Performing Arts, Colombo, Sri Lanka participated in this research study. The technical approach termed ‘the underwave and overwave motion’, a relaxed technical approach of Ortmann and Taubman was applied to minimize physical tension. Participants of this research study were required to perform and record their playing for two days and the music tracks were adjudicated by five judges. The collected data were statistically analyzed by the Shapiro-Wilk test to verify the relationship between the use of piano technique, performance, and perceived tension. The perceived tension difference was computed based on the collected data as ‘performance difference = day one performance minus day two performance; and perceived tension difference = day two perceived tension minus day one perceived tension’. Based on the results, the application of appropriate technical approaches to technically challenging extracts of music minimized the perceived physical tension and also improved the tone quality of the performance.

Keywords

Piano techniques, Relaxed approach, Perceived tension, Taubman approach

Introduction

Overuse injuries in the hands and other physical symptoms during piano performances are unique medical problems revealed in music research studies all over the world. Musicians, especially pianists are vulnerable to musculoskeletal injuries such as carpal tunnel syndrome, tendonitis and dystonia

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which will bring misery to them and affect their musical careers or higher studies. “Physical tension” is the root of many injuries, and injury prevention has become a popular topic since the 1980s because pianists’ injuries have been reported. Therefore students, teachers and professional pianists need to discover an efficient, stress-free and relaxed technical approach which will support the musician in his/her pursuit of excellence as professionals in this field.

Technique can be defined as the acquired skill in physical craft, which an artist brings to bear in expressing his own spiritual individuality (Fielden, 1927). However, pianists and teachers are still unaware of practical piano technique principles that can advance the rate of progress in mastering the instrument. As a result, many music students who enroll in piano study are regularly at risk of acquiring poor technical approaches at the keyboard, whether it is the piano or any other keyboard instrument. While this issue may be attributable to any number of factors, sound habits are too often neglected by piano instructors who are overwhelmed with the responsibility of guiding students to become proficient players, as such they fail to provide and/or reinforce basic physical habits of good musicianship. Consequently, students in pain possess substandard performance habits that hinder them from progressing on their own.

The aim of this study was to examine how the application of an appropriate technical approach to a technically challenging extract of a piece of music affects perceived physical tension and performance standards of piano students. It also sought to determine whether the implementation of relaxed physical approaches aid in diminishing physical tension and increase the performance level of piano students.

Literature Review

Scientific Approaches of Piano Techniques

Gerig (1994) explores many scientific approaches for the techniques of finger position of famous musicians from the early clavier method to the then contemporary techniques of posture, arm, hand and finger techniques while detailing the opinions of famous composers and musicians. One of the core elements of discussion is the Taubman approach (Milanovic, 2014). It has been introduced as a healthy technique that is based on cooperative movements of the human body whereby the pianist can enjoy playing the piano for a lifetime avoiding many injuries. The three basic tenets of this technique are alignment, balance, and movement.

The evolution of theories in piano technique discussed by Uszler, Gordon, and Smith (2002) explains different techniques of hand positions and different pedagogical methods that were accepted as early as the 1650s and had been used all the way through until the twentieth century.

Kris Kropff (2002) was the editor of a compilation of articles contributed by ten different authors who are regarded as top pedagogues and concert pianists in North America, deals with specific issues of healthy physical movements that are important for piano techniques. Dylan Savage summarizes the different concepts of biomechanics and physiology in piano playing as stated by various musicians and scientists from the eighteenth to twentieth century. Kreutz, Jane Ginsborg and Aron Williams have conducted a research study (2008) with two conservatoires in the UK, in which specific attention to musculoskeletal and no musculoskeletal problems in relation to students’ instrumental specialty and their health-promoting behaviors. They further discuss how the quality of musical practice and performance is threatened by

a combination of problems specific to the upper extremities and spine as well as those that result in fatigue. In order to enhance the quality of music performance education, preventative health programs offered at conservatoires and in university music departments should address these problems.

Experimental Design

The study of medical problems of performing artists has become an important field of research in recent years. Numerous studies have focused on finding answers to questions by adopting the experimental research design that uses in scientific research with the objective of finding out musicians' technical problems with the instruments they play and the biomechanics of the body. Therefore, this study attempted to investigate how relaxed technical concepts proposed by Ortmann and Taubman² may help pianists to be technically more efficient and how they affect their performances. For the purpose of the study, the most appropriate technical concept for the relevant musical excerpt is applied. This technical approach is termed "Walking hand and Arm" or frequently called 'the underwave and overwave motion'.

The Underwave and Overwave Motion

A useful description of this technical approach is found in the dissertation titled "Building a Solid Foundation: The Application of Taubman's Technical Concepts to the Teaching of Intermediate Piano Literature" (Perera, 2010).

"Under- and Overwave Motion" can be defined as elliptical wavelike motions of the forearm and wrist, slightly above and below the keyboard. This concept can be used in several situations. First, in passages containing leaps that are too large or too difficult to play with fingers, the speed and support of the forearm can be used instead of stretching the fingers to play those leaps with accuracy and in time. Secondly, it can be used in passages with arpeggios to gain freedom of movement and is also utilized as a tool to shape and voice a legato line".

Method

The participants of the study were 33 undergraduates studying piano as a major. They were enrolled in their first, second and third years of piano study at the University of Visual and Performing Arts, Colombo, Sri Lanka. Out of the sample, 26 pianists completed the research sessions successfully. All participants were notified about the nature of the study beforehand and were informed that they would be learning a useful technique to improve their playing of a piece of music. We sought to determine if there was a difference in their perceived tension levels and an improvement in the overall quality of performance when playing a piece of music on the piano on the first day (day one), without any instruction of a particular technical approach and on the second day (day two) with instructions on how to apply using the technical approach to specific places in the composition that were identified as posing a technical challenge onto the performer.

2. Dorothy Taubman, a famous piano educator and founder of Taubman Approach who applied this theory to teach her students. Although there are many writings about her techniques (References) she herself did not write about it.

Day One

The first stage of day one was 'The warm up stage' and day one, stage two was 'Understanding & Rating Perceived Body Tension.' In this stage, they rated their tension levels on a scale of 1 to 5. This copy included sections marked A and B with a tension scale of 1-5 for each section. The A and B sections were selected based on their technical difficulty and applicability of the 'underwave and overwave motion concept.' Participants were asked to rate their tension levels in each of these sections on a scale of 1 to 5, where 1 = No tension, 3 = Medium tension and 5 = High tension within a 10-Minute time limit.

The third stage is the 'recording session' which enables each participant to record his/her performance during a 10-Minute session.

In stage four, the 'Introduction and application of the technical concept: 'underwave and overwave motion' to sections A and B will be discussed. A specialized teacher who has experience teaching the 'underwave and overwave concept' was utilized as the proctor for this stage. The participants were given the opportunity to test their understanding of the concept by playing the piano several times by using with the correct application. Participants were then asked to come back a week later and play the same piece by applying the technical concept to sections A and B.

Jean-Henri d'Anglebert (1629-1691)

arr. Ray Abton

Moderato

The musical score is presented in four systems. The first system is marked *p* and the second *mf*. The third system is marked *mp* and contains two sections labeled 'A' and 'B' with fingerings 1-5 indicated below. The fourth system is marked *p*.

Figure 1: The stage two test copy with tension scale: The Minuet.

Day Two

Approximately a week following the intervention, participants were asked to attend Day-2 of the study. The day two test involved only three stages since there was no need for an introduction to the technical concept. Day two, Stage one was the same as Day one, Stage one.

Stage two on day two was 'rating perceived tension with application of technical approach'. This stage was significantly different from day one, stage two. The participants were now expected to play sections A and B of "The Minuet" applying the 'underwave and overwave motion' concept. Following some practice sessions, they were asked to rate their tension levels in sections A and B on a scale of 1 to 5. They were given a printed copy of the test, marked with a different participant code number as shown in Figure 1. Following the tension and release exercises, the stage two test copy of the music sheet with the marked tension scale for sections marked A and B was handed out. Section A and B remains the same, from mm. 12-13 and mm. 14-16 respectively. In addition, the new participant ID number was also written. Figure 1 illustrates the test copy of day two, stage two. However, the important difference was that participants were instructed to play their piece with the application of the new technical approach – 'the underwave and overwave motion' – to sections A and B. Participants were then asked to rate their tension levels on each of these sections on a scale of 1 to 5, where 1 = no tension, 3 = medium tension and 5 = high tension within a 10-minute time limit.

Participants played sections A and B using the "underwave and overwave motion". Participants rated their perceived tension on the scales for sections A and B. Day two, stage three is the final stage of the experiment – recording session with the technical concept. Once again, each participant was instructed

Adjudicating Music Tracks

The total number of recorded music tracks was 54 on day one and day two. Two different code systems were used to identify the files. These files were extracted, compiled, and randomly ordered for subsequent adjudication. The objective of the adjudication process was to determine if the application of the "underwave and overwave" technical concept affected the performance quality of sections A, B and the overall performance of the piece (The Minuet) in a positive manner. To conduct this process, five independent judges who have attained diploma-level qualifications from a UK examinations board in addition to the relevant teaching experience were selected. The marks were awarded for 3 sections; the overall performance, Section A, and Section B with a maximum of 30 marks for each section. Each audio file was played at least twice by the proctor. The judges awarded marks based on the adjudication criteria shown in the overview below.

Marking Criterion (30-21) - Demonstrated 'High to V. High' level

- Technical details:
 - Correct notes & rhythms played with confidence
- Fluency & continuity of tempo (overall):
 - Minimal or no slips throughout
 - Good sense of continuity
 - Musically convincing tempo

- Attention to musical details: Good use of appropriate articulation/phrasing

Marking Criterion (26-11) – Demonstrated “Medium- Medium High” level

- Technical detail:
 - A general security of notes and rhythm
 - Some wrong notes
- Fluency & continuity of tempo (overall):
 - Prompt recovery from any slips
 - Reasonable sense of continuity
 - Tempo suitable
- Attention to musical detail: Some use of articulation/phrasing

Marking Criterion (10 - 0) – Demonstrate “Low- Inadequate” level

- Technical detail:
 - Difficult with notes & rhythms
 - Many wrong notes & rhythms
- Fluency & continuity of tempo (overall):
 - Poor recovery from slips
 - Many breakdowns in continuity
 - Tempo not suitable
- Attention to musical details: No evidence of using articulation/phrasing Analysis

Figure 2: Overview of adjudication criteria.

The collected data were checked for normality using the Shapiro-Wilk W test for normality and the results are given in the appendix-B (Shapiro, 1965). Except for one data set all the other data sets passed the test for normality at a confidence level of 95%. The most appropriate test to verify the research claims is to use a hypothesis test. Considering the dataset and the nature of the experiment a student’s t-test at a confidence level of 95% was used to verify the research claims. (Fischer Box, 1987: 45-52).

Performance evaluations that were carried out based on the corresponding recorded audio clips before and after the application of the technique were used to compute the difference in the quality of performance for each subject. Similarly, the perceived tension difference was also computed based on the collected data as given below:

<p>performance difference = day one performance minus day two performance perceived tension difference = day two perceived tension minus day one perceived tension</p>

Overall Performance Difference

Table 2 shows the results for the overall performance difference after the application of the technique for sections A and B. The following hypothesis is tested.

H10: Application of the technique does not increase the overall performance

H1A: Application of the technique increases the overall performance

The above hypothesis can be tested as follows using the sample mean of the overall performance difference.

H10: Mean Performance Difference ≥ 0

H1A: Mean Performance Difference < 0

Based on the t-test we can accept the alternate hypothesis at a confidence level of 95% since the p-value is less than 0.05. Note that a negative performance difference indicates an improvement in performance and vice-versa. Therefore, we can accept the research claim that the use of the selected technique improves overall performance.

Performance Difference	N	Mean	SE	SD
Overall Hypothesised	23	-1.72	0.833	4.00
Mean	-1.72			
95% CI	□□	to -0.29		
SE	0.833			
t statistic	-2.07			
DF	22			
1-tailed p	0.0254			

Figure 3: t-test results for overall performance difference.

graphical representation of the relationship so that the

performance and perceived tension reduction will be positive values in the graph. Perceived tension values were also

normalized (min/max) to match the performance difference values. The performance difference values were also sorted in ascending order. The graph indicates a general tendency for improved performance with a reduction in tension. A proper correlation or regression test is required to conclusively identify the relationship.

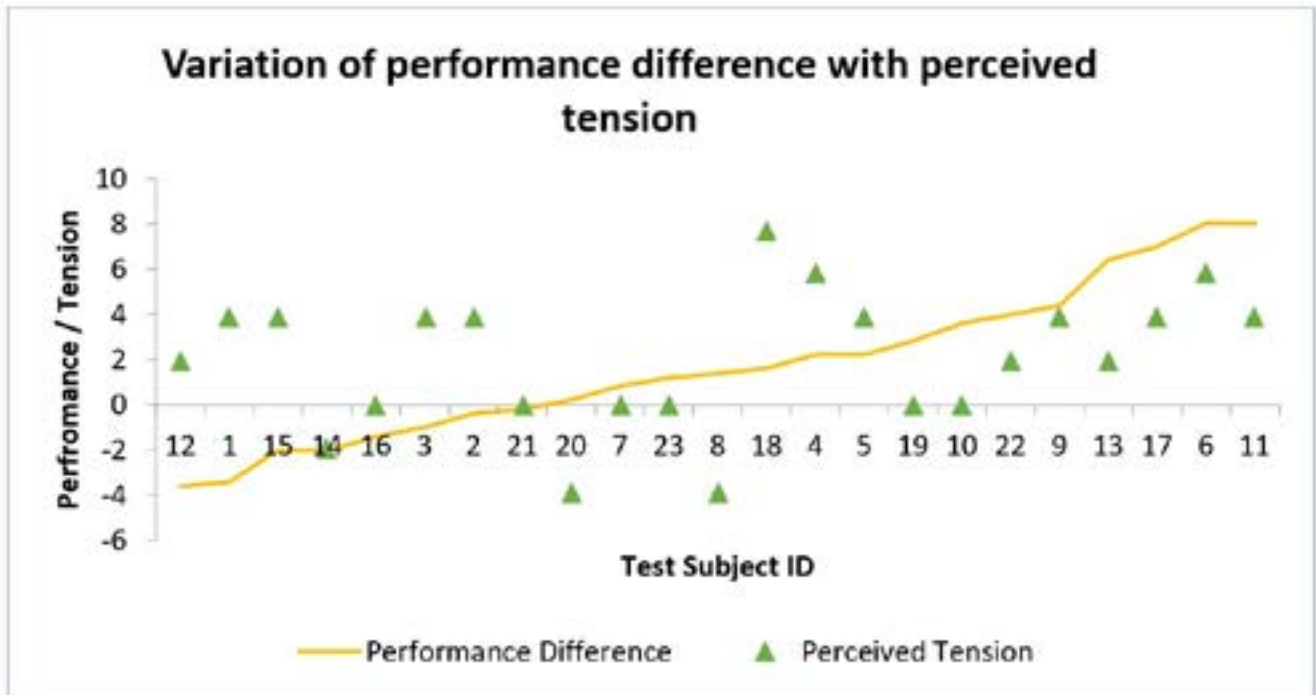


Figure 4: variation of performance difference with perceived tension.

Conclusion and Suggestions

The purpose of this research study was to examine how the application of an appropriate technical concept to a technically challenging extract of a piece of music affects the perceived physical tension and performance quality of piano students. Undergraduate music majors studying piano at the Department of Western Music at the University of Visual & Performing Arts, enrolled in their first, second and third years of piano study, were used as subjects to validate the research claim. Based on the results, it can be concluded that the application of appropriate technical approaches to technically challenging extracts of music reduces perceived tension.

Therefore, from an early stage, it is important to introduce music students to apply appropriate technical approaches that deal with the efficient use of the full body for a given musical score in addition to learning the basic principles of piano technique. By doing so music students will be able to apply appropriate techniques to the score on their own. It may be important also to educate them about the overemphasis of technique where it should be used for the primary purpose of performing music. The instructor should be able to advise the student on striking a proper balance in the use of technique and musical details.

Future studies with a larger sample size and with a technically challenging scale score could be used to substantially validate the research claims. Such a study could be used to motivate music teachers and students to use effective techniques and also inform them about the importance of the use of proper techniques in playing the piano.

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