
SYMPOSIUM 5: Enhancing Musical Performance

Symposium: Enhancing Musical Performance

Aaron Williamon; Royal College of Music, U.K.

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1. Background

Musicians routinely encounter multifaceted demands on skill in both practice and performance, often having to process and execute complex musical information with novel artistic insight, technical facility and a keen awareness of audiences' expectations. One of the most exciting challenges facing music researchers is to explore ways of assisting performers to meet those demands efficiently and effectively. For various methodological and technological reasons, progress has been disappointingly slow (at least from the musician's perspective). Increasingly, however, researchers are forging cross-disciplinary collaborations and generating innovative methods for investigating how exceptional performances are produced.

2. Aims

This symposium aims to detail one such collaboration that is the first of its kind to combine and adapt training techniques drawn from clinical, dance and elite sporting contexts to music. The project, *Zoning In: Motivating the Musical Mind*, is based on a partnership between the Royal College of Music and The Leverhulme Trust and aspires to enable musicians to enhance their performance and manage the high levels of stress that often accompany performance situations. Students at the College have worked with a team of psychologists and musicians to learn individually-tailored training routines based on systematic research from three complementary areas:

- (a) neurofeedback (see Gruzelier *et al.*, this volume)
- (b) physical fitness (see Wasley & Taylor, this volume)
- (c) mental skills training (i.e. cognitive-behavioural interventions; see Connolly, this volume).

3. Main Contributions

The contributors aim to place the burgeoning area of performance enhancement research within the broader context of music psychology. In addition, a review paper (see Williamon, this volume) explores the prospects and limits of performance enhancement research in music. Each paper in this symposium offers an in-depth analysis of the performance aspect(s) to which the respective technique is most relevant (e.g. general features such as concentration, creativity and stage fright and more music-specific characteristics such as memorisation and practice). Also, each explores the generality and usefulness of the technique for all types of performing musicians (instrumentalists, vocalists and conductors). Finally, as might be expected from a survey of performance enhancement research, the papers address the educational utility of the techniques.

Enhancing Musical Performance: Prospects and Limits

Aaron Williamon; Royal College of Music, U.K.

Time: Thurs 18 4.30 pm, Stream: A Proc. Page: 88-88

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This paper explores the cognitive, perceptual, motor and social demands on today's performers and the extent to which scientific research can realistically help them meet those demands.

It considers the prospects and limits of performance enhancement research and introduces aspects of performance that are most susceptible to such enhancement (e.g. one's effectiveness in memorising music and methods of coping with performance anxiety). Furthermore, it previews the major themes to emerge from other papers in this symposium, provides necessary background information needed to underpin the theoretical context of these themes and reviews the methodological challenges that researchers must

overcome when measuring performance enhancement in music.

Clearly, performance enhancement in music can take various forms, operating at different levels and on different timescales. This paper, therefore, offers implications for performers, teachers and researchers by providing an understanding of the background and theory underpinning applied music psychology research.

Comparing Learned EEG Self-Regulation and the Alexander Technique as a Means of Enhancing Musical Performance

John H. Gruzelier¹, Tobias Egner¹, Elizabeth Valentine², Aaron Williamon³; ¹Imperial College of Science, Technology and Medicine, U.K.; ²University of London, U.K.; ³Royal College of Music, U.K.

Time: Thurs 18 5.00 pm, Stream: A

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Venue: New South Global, Webster Level 1

Voluntary self-regulation of certain aspects of the electroencephalograph (EEG) can be learned through a training process of EEG biofeedback (neurofeedback). This form of operant EEG conditioning has found successful clinical application in the treatment of disorders relating to problems of attention and arousal regulation. We previously applied neurofeedback protocols that aim at enhancing attention and relaxation processes to conservatoire music students to research potential benefits for their performance skills. We found that students who had participated in a neurofeedback training program of 3 types of protocols ("beta1", "SMR", "alpha/theta") showed music performance improvements not evident in a no-training control group. It was further found that learning on an "alpha/theta" (a/t) enhancement protocol correlated highly and positively with improved performance ratings. A second study was devised in order to replicate and clarify these findings by assessing the different EEG self-regulation protocols' impact in separate groups in comparison to an Alexander Technique training group. We hypothesized that the a/t training group would display superior improvement in music performance. Video-recorded pre- and post-training performances were rated by 3 expert judges who were blind to the students' group membership and order of performances. In line with our predictions it was found that the a/t group displayed significant improvements on a number of performance assessment variables not evident in the Alexander Technique group or other neurofeedback training groups.

The Effect of Physical Activity and Fitness on Psycho-Physiological Responses to a Musical Performance and Laboratory Stressor

David Wasley, Adrian Taylor; De Montfort University, U.K.

Time: Thurs 18 5.30 pm, Stream: A

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Various theories and research propose that being fitter and more physically active has a beneficial effect on the individuals' response to stress. The results of research to date are equivocal regarding application to real world activity due to predominance of work using laboratory-based stressors. However, only a few studies have examined the effects of naturally occurring rather than laboratory stressors. This work investigated the relationships between physical activity and fitness and reactivity to an assessed musical performance and lab stressor (stroop). The work also investigated the impact of 16 weeks of aerobic exercise on reactivity to a follow-up performance. Results provide some support for the relationship between fitness and a reduction in the reactivity to the stroop test but not performance. The aerobic exercise trained group had lower absolute levels in heart rate at rest, prior to and during performance at follow up, but despite increases in fitness, they did not reduce physiological reactivity to music performance or stroop test. Compared with other groups the benefit of higher levels of fitness to cope with stressors is somewhat supported. Aerobic exercise training was beneficial in reducing absolute physiological levels but not reactivity response. The effect on lower absolute levels of physiological function may translate into reduced risk factors for later health complications (e.g. Coronary heart disease).

Mental Skills to Optimise Musical Performance

Christopher Connolly; SyCon: The Sporting Bodymind Group, U.K.

Time: Thurs 18 6.00 pm, Stream: A Proc. Page: 97-100
Venue: New South Global, Webster Level 1

The aim of this research project was to explore the benefits of and participants' experiences from the first two years of a three-year programme of Mental Skills Training at the Royal College of Music. The objective of the programme (named *Zoning In*) was to design and pilot a curriculum of mental training that drew on applied sports psychology techniques to enhance performance. Students took part in a programme with three distinct elements: (1) instruction on a range of basic mental rehearsal techniques in a classroom setting, (2) the use of performance profiling to establish performance goals and objectives for each student and (3) individual coaching sessions for application of mental techniques and performance profiling. In a follow-up qualitative review of the content of the training, students found the following techniques most useful: relaxation techniques; mental imagery involving skills rehearsal; mental imagery involving use of symbols for evoking qualities; performance profiling for self assessment and goal setting; and individual coaching for refining the training to target specific issues. They found less useful: verbal and associate word techniques; prioritisation processes; and mental imagery with a prescriptive or defined approach (e.g. putting distractions in a black box).