Profiling musicians' health, wellbeing, and performance

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This study profiles music students' physical and mental fitness for performance. Participants were recruited from the Royal College of Music (RCM, n=59) and Royal Northern College of Music (RNCM, n=32), and standardized measures of health promoting behaviors, anxiety, perfectionism, cardiovascular fitness, and physical strength and flexibility were employed to assess students' performance-related health and wellbeing. The resulting profile indicates that (1) students tend to fall outside of their target BMI, with more students falling below their target than above it, (2) cardiovascular fitness is most frequently below average or average, with under 40% of students achieving above average cardiovascular fitness, (3) student fatigue correlates variously with aspects of perfectionism, trait anxiety, health promotion, and self-regulated learning, and (4) pain that is reported to stop performance is most often linked to the upper arm/elbow, left and right hands, and the back. The value of such profiling exercises in educational contexts is discussed, with examples of implementation drawn from a UK conservatoire.

Keywords: health profiling; physical fitness; mental health; health promoting behaviors; music education

Having the capacity to assess musicians' skills and abilities is of particular benefit for researchers, musicians, and those involved in musicians' educational and professional development. The knowledge generated through physical and mental profiling exercises can be applied, for instance, as the basis for refining current training approaches, tailoring and implementing

novel performance enhancement initiatives, and raising awareness of important issues of musicians' health and wellbeing.

This article highlights the value of skills profiling in educational and professional contexts. Specifically, we profiled music students' fitness for performance through a wide range of self-report and objective physical measures of health and wellbeing. The application of the resulting profile within a conservatoire context is used to illustrate the value of such work to the training of performers.

METHOD

Participants

A total of 91 students (57 female, 34 male; mean age=21.88 years, SD=4.63 years) from the Royal College of Music (RCM, n=59) and the Royal Northern College of Music (RNCM, n=32) took part in the study. The participants represented the following instrumental specialisms: strings (n=42), keyboard (17), woodwind (14), voice (8), brass (8), composition (1), and percussion (1).

Materials

Music students' fitness for performance was profiled through the following self-report measures:

- Questions on musical/personal background (e.g. age, sex, instrument)
- Short Warwick Edinburgh Mental Wellbeing Scale (WEMWBS)
- Frost Multidimensional Perfectionism Scale (Frost MPS)
- Health Promoting Lifestyle Profile (HPLP) II
- Self-efficacy for Musical Learning Scale
- Self-regulation Scale
- Spielberger Trait Anxiety Inventory (TAI)
- Ratings of musculoskeletal health and fatigue

Descriptions of the above measures, including methods for scoring each and their relevant subscales, are provided by Kreutz *et al.* (2008, 2009) and Ginsborg *et al.* (2009).

Procedure

The profiling procedure was divided into three stages. Stage 1 introduced the participant to the profile study, secured written consent, and screened health

suitability for the physical assessment. Each participant's height (cm), weight (kg), hand spans (cm), and finger spans (angle) were recorded.

Stage 2 was conducted online using the environment provided by Surveymonkey®, to which the self-report measures above were adapted. The questionnaire was identical at both institutions, and students were able to ask a member of the research team for clarification on the questions presented as necessary.

Stage 3 comprised the physical assessment, conducted by an exercise scientist. The assessment included measures of balance (dominant balance), grip strength (kg), core flexibility (cm), body fat/lean percentages, body fat/lean mass (kg), body mass index (BMI), shoulder flexibility internal and external (dominant balance), and sub-maximal cardiovascular fitness (heart rate recovery, in bpm). Body composition measurements were taken using a bioelectrical impedance meter and sub-maximal fitness by a 3-min step test with bpm measured using a Polar heart rate monitor. Participants were given a printed summary of their results and were fully debriefed.

Data analysis

Preliminary analyses of the data revealed no significant differences between the student cohorts from each institution, except on the spiritual growth subscale of the HPLP II ($t_{89}=3.07$, $p<0.01$, where RCM>RNCM) and the Self-regulation Scale ($t_{89}=1.99$, $p=0.05$, where RCM>RNCM). For the purposes of this article, the two cohorts have been combined in all analyses.

Here, we focus on the physical measures of fitness, as well as Pearson correlations between physical measures and self-report measures, including ratings of musculoskeletal health and fatigue. Descriptive statistics for each of the measures employed are available from the corresponding author by request.

RESULTS

Descriptive statistics for BMI and sub-maximal cardiovascular fitness—as representative of key profiling measures of physical fitness—are illustrated in Figures 1 and 2, respectively.

Significant correlations between self-reported musculoskeletal health and fatigue, psychological self-report measures, and physical fitness are listed in Table 1. For these analyses, ratings of musculoskeletal health and fatigue were grouped into six categories, following the factor analysis reported by Kreutz *et al.* (2008).
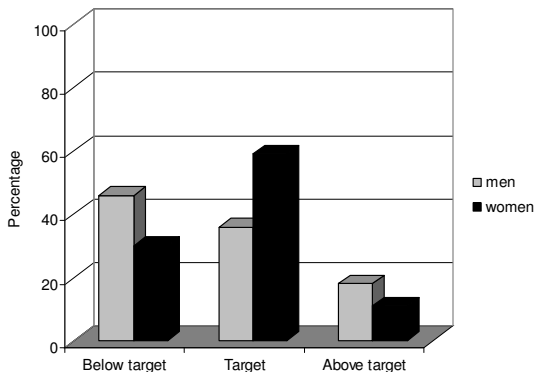
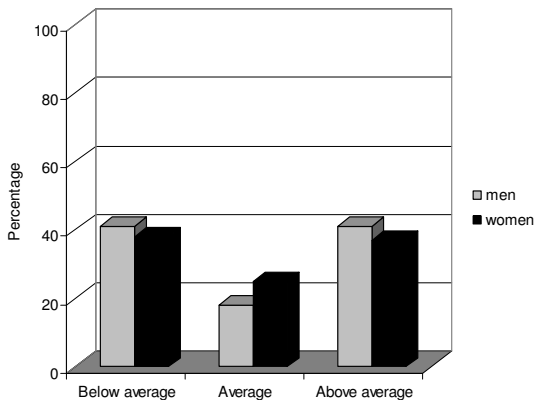*Figure 1.* Distribution of BMI for male and female participants (n=89).

Figure 2. Cardiovascular fitness. Below average includes "below average," "poor," and "very poor." Above average includes "above average," "good," and "excellent" (n=84).

DISCUSSION

The profile arising from these results can be summarized as follows: (1) students tend to fall outside of their target BMI, with more students falling below their target than above it, (2) cardiovascular fitness is most frequently below

Table 1. Significant Pearson correlations (p<0.05) between ratings of pain in the elbows, hands, spine, mouth and feelings of fatigue with other self-report measures and BMI, where + indicates a significant positive correlation and - a negative correlation.

	Upper arms/elbows	Left hand	Right hand	Spine	Mouth	Fatigue
General health rating		-	-			-
Pain stops performance	+	+	+	+		
HPLPII	sm+					sg- sm-
WEMWBS		-				-
Frost MPS				pec+	ps- o-	cmd+ pec+
Self-regulation						-
TAI						+
BMI	-					

Note. sm=HPLPII subscale for stress management, sg=HPLPII subscale for spiritual growth, pec=Frost MPS subscale for parental expectations and criticism, ps=Frost MPS subscale for personal standards, o= Frost MPS subscale for organizational skills, cmd=Frost MPS subscale for concern over mistakes and doubt above actions.

average or average, with under 40% of students achieving above average cardiovascular fitness, (3) student fatigue correlates variously with aspects of perfectionism, trait anxiety, health promotion, and self-regulated learning, and (4) pain that is reported to stop performance is most often linked to the upper arm/elbow, left and right hands, and the back.

Given the physicality of musicians' work, such a trend toward poor fitness is concerning. With the injury and pain problems frequently reported in conservatories—and in light of profiling exercises such as reported here—there is clearly a need for educational programs to address this issue. At the RCM, for example, the profile is used to inform a compulsory seminar series for all incoming undergraduate students, designed to raise awareness of the importance of musicians' fitness and wellbeing. To enable students to follow this up with practical steps, poor fitness demonstrated in the profile is targeted through a fitness awareness scheme, and aspects of student fatigue and injury addressed through "Peak Performance Workshops," introducing students to Alexander technique, yoga, Pilates, and tai chi, among other interventions.

Further work to extend the sample is underway, with new intakes at the RCM and RNCM, and at other UK conservatoires, in order to refine and streamline the profiling procedure. The tools to emerge from this process will

be able to inform educators of students' fitness for performance, allowing them to take necessary steps to safeguard students' health and wellbeing.

Acknowledgments

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References

Ginsborg J., Kreutz G., Thomas M., and Williamon A. (2009). Healthy behaviours in music and non-music performance students. *Health Education, 109*, pp. 242-258.
Kreutz G., Ginsborg J., and Williamon A. (2009). Health-promoting behaviours in conservatoire students. *Psychology of Music, 37*, pp. 47-60.
Kreutz G., Ginsborg J., and Williamon A. (2008). Music students' health problems and health-promoting behaviors. *Medical Problems of Performing Artists, 23*, pp. 3-11.