

## **A cross-over from Sport Psychology to the Psychology of Music: An intervention study on undergraduate music students**

BAREND J.M. STEYN<sup>1</sup>, MARGARETHA H. STEYN<sup>2</sup>, DAVID J.F. MAREE<sup>2</sup>  
AND CLORINDA PANEBIANCO-WARRENS<sup>3</sup>

<sup>1</sup>*Department of Sport and Leisure Studies,* <sup>2</sup>*Department of Psychology,* <sup>3</sup>*Department of Music,*  
*University of Pretoria, Pretoria, South Africa.*  
E-mail: ben.steyn@up.ac.za

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### **Abstract**

The primary aim of this research was to evaluate whether the cross-over from Sport Psychology to the Psychology of Music in terms of the knowledge base, intervention Psychological Skills Training (PST) protocols and psychometric measurements was meaningful. A second aim was to ascertain whether the psychological skills levels and mindfulness levels per se have improved amongst the undergraduate students. Extensive research on psychological benefits of PST in sport has been conducted in Sport Psychology, with unambiguously positive results. Mindfulness training, and specifically the mindfulness-acceptance-commitment (MAC) approach have been applied in sport and as in the case of PST, it has not yet been fully utilized in the context of music. This specific combination of PST and the MAC approach were tested on undergraduate music students in a seven-week intervention program. A quasi-experimental design was implemented in this research. Voluntary participation was adopted to ensure that the participants were fully engaged in and committed to this study. A convenience sample of 36 undergraduate music students from the Department of Music at the University of Pretoria was selected. The experimental group consisted of 21 students, and the remaining 15 students composed of the control group. Within the experimental group significant improvements in performance anxiety, psychological skills and mindfulness indicated that the cross-over from the performance-evaluative context of sport to music was meaningful and partially successful.

**Keywords:** PST, MAC approach, performance anxiety, concentration, music students.

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### **Introduction**

A cross-over from Sport Psychology to the Psychology of Music is not a new area of development. One of the first joined interdisciplinary research projects that aimed to establish a meaningful cross-over from Sport Psychology and the Psychology of Music was attempted by Orlick, who is known internationally for his work and research in the applied setting of Sport Psychology. Orlick collaborated with Talbot-Honeck in the publication of one of the first articles on psychological skills in music performance (Talbot-Honeck & Orlick, 1998). This

creative research effort by Talbot-Honeck and Orlick (1998) employed Orlick's (1992) model of excellence as a framework for research on how top classical musicians can achieve and maintain a consistent high level of performance.

In an extensive literature overview, Tubiana and Amadio (2009) revealed significant research developments in the area of Psychology of Music. However, for some reason the research in terms of multi-faceted Psychological Skills Training (PST) has lagged behind in the Psychology of Music, if compared with the established research body of Sport Psychology. Gould (2002), a prominent sport psychologist, made a plea for Sport Psychology researchers to use their expertise in meaningful cross-overs to other domains, including music. This notion becomes more meaningful in a closer look at the similarities between the performance domains of sport and music. Music performance, whether the musicians are a member of a world-class symphony orchestra who performs to thousands of spectators, requires not only years of sophisticated training and persistence, but also very refined motor skills that have to be exercised under conditions of enormous pressure. When one compares a musical performance to a sport performance, one realizes that there are some striking similarities. Performing for an audience, doing an audition, or sometimes being judged (in the case of competitions) can create extreme levels of music performance anxiety that need to be managed and may be equated to the extreme levels of performance anxiety, which an Olympic athlete has to manage. In both these kinds of situations, intense concentration under pressure is required. The question is how interchangeable are the different approaches between the performance-evaluative contexts of sport and music. The primary aim of this study was to determine if interchange between performance-evaluative contexts of sport and music was meaningful.

In the significant research contribution of Clark and Williamon (2011), which can be seen as one of the first full-blown multi-faceted PST intervention studies in music, the researchers identified certain gaps in the research on PST in music. Imagery training by musicians and the full impact of proper training has not yet been fully explored. Another underdeveloped area of the PST research in music is to determine the beneficial effect of proper well-refined pre-performance routines as part of a multi-faceted PST approach. The work of Connolly and Williamon (2004) is a step in the right direction in terms of the significance of research of pre-performance routines in a PST approach. The PST skills such as goal setting, imagery, self-talk and the ability to perceive anxiety symptoms as facilitative of performance have not yet been fully explored. The lack of control groups in existing research is problematic, because it is difficult to determine whether the changes in the experimental group were actually an effect due to the intervention programme. Taking all the research gaps into account, the plea of Connolly and Williamon (2004) for a more comprehensive multi-faceted intervention approach is sensible and meaningful.

With the intention to increase the multi-faceted components in the intervention programme, a second aim of this current study was not only to utilize the standard psychological skills of concentration, arousal management, mental imagery, goal setting and self-confidence, but also to add and incorporate the mindfulness-acceptance-commitment (MAC) approach in an effort to introduce new facets into the intervention approach.

*Combining Psychological Skills Training (PST) with a mindfulness approach (MAC)*

The reason for integrating PST and mindfulness training can be traced back to some problem statements that experts experience in applied performance-evaluative contexts such as sport and music (Gardner & Moore, 2004, 2006; Ravizza, 2005). The main aim of all PST is to create an optimal state of mind. Orlick (1998: 122) emphasizes the importance of an ideal state of mind as a prerequisite for optimal performance, and his view that 'state of mind is everything' captures the core aim of PST. Therefore, the development and implementation of PST programmes are meant to have an impact on a target group's or person's state of mind in such a way that an optimal state of mind for performance can be achieved (Orlick, 1998).

Ravizza (2005) noticed in his consultation work with elite athletes that an optimal state of mind could not be experienced all the time. Optimal states in performance (also known as being in the zone or in a flow state) are only experienced for 20% of performance time. The question that then arises is what happens to athletes in the 80% of their time when they are not in an optimal state and where they have to work hard to maintain their performance levels. Ravizza (2005) describes this ability to work hard in spite of unfavourable conditions as the ability to become comfortable being uncomfortable.

This is where the mindfulness component, with specifically referring to the MAC approach, becomes meaningful as an effective approach where an optimal state of mind is not present. The principles of mindfulness, acceptance and commitment (MAC) enable a performer to commit fully to the task at hand, in spite of not being in an optimal state or even experiencing uncomfortable emotions accompanied by negative thoughts (Gardner & Moore, 2007). The additional ability to be able to engage fully in a task and to commit to high levels of performance in spite of unfavourable conditions or an unsatisfactory state of mind is crucial for athletes and musicians who have to maintain high performance levels. The MAC approach can therefore be seen as a safety net when a performer has done their best to implement all the psychological skills that are available, but is still unable to reach the optimal state of mind that is necessary for optimal performances.

The decision to apply the strategy of combining PST and mindfulness training in one integrated intervention programme was reaffirmed by reviewing the research of Bernier, Thienot, Codron and Fournier (2009) on elite golfers. According to Bernier *et al.* (2009: 330), the combination between PST and mindfulness training represents a third wave in cognitive research: "The goal of this third wave approach is to teach athletes to accept their cognitions, emotions, and sensations and to commit themselves to action, rather than fighting against negative thoughts and unpleasant emotions." Bernier *et al.* (2009) also stress the importance of doing PST in a mindful way. The theoretical framework for this study falls into the third wave of cognitive research and the interpretation of the research data of this study can be meaningfully understood in the context of this framework.

### **Aims and hypotheses**

The primary aim of this research was to evaluate whether the cross-over from Sport Psychology to the Psychology of Music in terms of the knowledge base, intervention PST protocols and psychometric measurements was meaningful. A second aim was to determine whether the combination of PST and mindfulness training (MAC) was effective in terms of the measuring instruments employed in this study and the participants' feedback.

The first hypothesis was that a cross-over from Sport Psychology to the Psychology of Music could be meaningful. The second hypothesis for this study was that the experimental group in relation to the control group would improve significantly in terms of psychological skills, mindfulness levels and the ability to manage performance anxiety.

### **Methodology**

#### *Participants*

A convenience sample of 36 undergraduate music students from the Department of Music at the University of Pretoria, South Africa was selected for this study by following a voluntary approach, where the students willfully and chose to be part of the experimental or control group. This methodological approach is therefore a purposeful sampling method, which had to be adopted due to the importance and prerequisite of the participants' motivation and commitment to this intervention programme. A quasi-experimental design was implemented in this study and therefore confounding variables such as year group, gender and musical instruments were taken into account (Whitley, 2001).

The sample was heterogeneous, because it consisted of males, females and students from different ethnic and cultural backgrounds, and ranged from first-

year to fourth-year students. The whole spectrum and variety of music art forms were included in this sample. The undergraduate music students achieved a total of 88% attendance of the intervention programme sessions, which is high in comparison with attendance in similar studies (Edwards & Steyn, 2008).

### *Measuring instruments*

This intervention programme made use of three questionnaires namely, the Bull's Mental Skills Questionnaire, the Five Facet Mindfulness Questionnaire (FFMQ), and the Competitive State Anxiety Inventory-2 (CSAI-2).

Bull's Mental Skills Questionnaire measures a person's capacity to use his or her mental skills. This questionnaire measures the constructs of mental imagery (sample item: It is difficult for me to form mental pictures), mental preparation (goal setting) (sample item: I usually set goals that I can achieve), self-confidence (sample item: My confidence drains away as competitions draw nearer), anxiety and worry management (sample item: I worry that I will disgrace myself in competitions), concentration (sample item: My thoughts are often elsewhere during competitions), relaxation (sample item: I am able to relax myself before a competition) and motivation (sample item: I usually feel that I try my hardest (Bull, Albinson & Shambrook, 1996).

The Cronbach alpha levels for the above-mentioned seven subscales were found to be .80, .64, .62, .61, .59, .72, and .72 respectively, which are generally high (Snauwaert, 2001). The Cronbach alpha for total score was  $\alpha = .912$  in this current study. In order to ensure high reliability, Cronbach alpha levels must be on an acceptable level and the general limit in the field of Humanities is above  $r = .60$  (Crocker, Kowalski & Graham, 1998). This measuring instrument was recently researched in the South African sport context, where new norms were determined. These norms correlated closely with international norms (Edwards & Steyn, 2011). The scale has been translated into Afrikaans language. The questionnaire itself consists of 28 items that range from 1 (*strongly disagree*) to 6 (*strongly agree*) on a six-point Likert scale (Edwards, 2007).

The Five Facet Mindfulness Questionnaire (FFMQ) assesses five factors of a general tendency to achieve a mindful state in daily life, which includes observing, describing, acting of awareness, a non-judging approach of one's inner experience and non-reactivity to inner experience (Baer *et al.*, 2008). This questionnaire consists of 39 items rated on a five-point Likert scale that ranges from 1 (*never or rarely*) to 5 (*very often*) or (*always true*). The Cronbach alpha levels are between .72 and .92. The Cronbach alpha score for this questionnaire was  $\alpha = .843$  in this current study.

This questionnaire has been researched in a South African clinical context (Kok, Kirsten & Botha, 2011). It was developed for the general population and for a variety of clinical and normal everyday life settings. The questionnaire measures elements of mindfulness such as observing (sample item: I notice the smells and aromas of things), describing (sample item: I'm good at finding words to describe my feelings), acting of awareness (sample item: I find myself doing things without paying attention), non-judging of inner experience (sample item: I think some of the emotions are bad or inappropriate and I should not feel them) and non-reactivity to inner experience (sample item: I perceive my feelings and emotions without having to react to them) (Carmody & Baer, 2008).

The Competitive State Anxiety Inventory-2 (CSAI-2) measures two different types of anxiety, namely cognitive anxiety and somatic anxiety. It also measures a person's level of self-confidence. This inventory has been employed in a sport and a music context (Clark & Williamon, 2011). The reliability of the CSAI-2's three subscales, namely cognitive anxiety, somatic anxiety and self-confidence, is very high, because their Cronbach alpha scores range between .79 and .90, as reported in the assessment construction of this inventory (Martens, Burton, Vealey, Bump & Smith, 1990). The overall Cronbach alpha score for this inventory was  $\alpha = .695$  in this current study.

This questionnaire consists of 27 items, assessed using a four-point Likert scale with a range from 1 (*not at all*) to 4 (*very much so*). The construct of somatic anxiety refers to physiological anxiety that is displayed in the form of bodily symptoms (sample item: I feel nervous). The construct of cognitive anxiety refers to the psychological anxiety displayed through anxious thoughts in the mind (sample item: I am concerned about this competition). The construct of self-confidence refers to feeling comfortable, at ease, and secure, as well as a person's overall confidence and optimism towards a specific performance-evaluative situation (sample item: I feel self-confident) (Roberts, Spink & Pemberton, 1999).

### *Procedure*

The Post-graduate and Ethics Committee of the Faculty of Humanities at the University of Pretoria, South Africa granted ethical clearance and approval for this study (Ref Number: 25033779). This study adhered to all the ethical guidelines and requirements of the University of Pretoria.

A comprehensive information letter with detailed information was provided to each undergraduate music student who was a potential participant. During the information session, all student queries were addressed and the process was explained before the students were required to sign the informed consent form. The undergraduate music students were also given the option to withdraw from

the study at any juncture during the research process without prejudice. Each student created his or her own personal code in order to protect his or her identity and to ensure confidentiality. Logistical support inside the Department of Music was provided by one of the lecturers.

After the information session an open invitation was issued to the undergraduate music students. Once the sample had been finalized, the experimental- as well as the control group underwent the pre-intervention testing session. After the completion of the seven-week intervention programme, the same procedure was followed in the post-intervention testing.

### *Psychological skills and the MAC training programme*

The combined PST and MAC intervention sessions consisted of a one-hour group session once a week for seven weeks. The PST component was developed over a 20-year period by the intervention expert, who is fully qualified in working with elite sport participants in a variety of sport codes, and other high performance-evaluative contexts such as performing arts, music performance, and the corporate environment. The PST programme is based on established sport psychological approaches which were developed from leading practitioners in the field of Sport Psychology, such as Murphy (2005), Nideffer (1992), Orlick (1998) and Ravizza (2005). However, these approaches have been adapted, integrated and customized by the intervention expert according to his unique style and according to the specific demands of the sport codes and clients that he encountered over the 20 years of experience in an applied setting.

The main goal of this approach was to conduct the PST in a mindful way and to focus specifically on the accepting of internal thoughts, emotions and bodily experience and external circumstances that cannot be controlled. This approach was implemented in line with the third wave of cognitive approach as demonstrated in the research of Bernier *et al.* (2009). The main focus in the intervention was to encourage students to accept all the experiences as they unfold during the PST. This acceptance principle is especially relevant in the pre-performance routines before music exams or -performances. Emphasis was put on the fact that the students must accept their anxiety levels, even when it still feels uncomfortable. Acceptance of this uncomfortable anxiety levels and full task engagement on the music performance itself was emphasized. The reason for this is the fact that efforts to correct or to remove the uncomfortable anxiety feelings may lead to more self-orientation and may aggravate the anxiety and may result to more destructed and divided ineffective task focus. The awareness exercises that were introduced to the participants included the brief centering exercise, the task-focused attention exercise, as well as awareness through movement and daily activities (Gardner & Moore, 2007). The key PST components in this intervention programme were attention and arousal control

and the ability to concentrate under pressure. The centering and different breathing techniques were introduced. Other PST techniques that were also integrated into the intervention were goal setting, imagery, psyching up and psyching down skills, self-talk, pre-performance routines, mental rehearsal and cognitive restructuring. The importance of perceptions in terms of interpreting the anxiety symptoms as positive, facilitative and constructive was central in the training. The perception of success and failure (goal orientation), as well as the perception of one's own ability (self-theories) in an incremental framework (growth mindset) was highlighted throughout the intervention programme.

Practical activities that were provided in the intervention sessions included awareness of senses, concentration exercises (concentration grid, single minded focus versus multitasking), arousal control techniques (centering, breathing and relaxation), imagery (PETTLEP model), goal setting (performance, process and outcome goals), and perception switches (case studies). The last concluding session focused on combining the MAC approach and integrating all the psychological skills.

#### *Data treatment and statistical analysis*

The collected measurements were analysed by means of the IBM Statistical Product and Service Solutions package (SPSS). In order to determine whether the experimental and control groups were the same before training and whether differences in measurements after intervention can be ascribed to the received interventions, the two groups were described and compared according to basic statistical procedures (Tabachnick & Fidell, 1996). The descriptive statistics presented the reader with the basic features of the study and provided an overview of the different research findings. Cronbach alpha values were calculated to test the variability of the measuring instruments. Mann-Whitney U test was used to compare the experimental- and control groups on all pre-intervention test measurements, in order to determine whether the two groups were similar before interventions. The Mann-Whitney U test was also used in the post-intervention test to determine if any significant changes occurred between the experimental- and control group in terms of the measuring instruments. To determine whether changes took place from the pre-intervention test measurements to the post-intervention test measurements within groups, the score within each group (the experimental- and control groups) were compared by means of the Wilcoxon signed-rank test.

#### **Results**

The measuring instruments used in this survey were found to be reliable. The Cronbach alpha scores were all above the benchmark of .7, except for the CSAI-2 that was at .695. No statistical differences were found between the



experimental- and control groups during the pre-intervention testing, implying that the two groups were similar before the intervention programme in terms of the four indicated measuring instruments.

As found during the pre-intervention test measures, there were no significant differences between the experimental and the control group's scores on the Bull's Mental Skills Questionnaire during post-intervention testing. Within the experimental group the following statistical significant differences was noted between the pre- and post-intervention test measurements: Self-confidence ( $p = .017$ ); anxiety and worry management ( $p = .017$ ); concentration ability ( $p = .002$ ); relaxation ability ( $p = .002$ ); and motivation ( $p = .002$ ).

The scores of the experimental group increased significantly from the pre-intervention test measurements to the post-intervention test measurements. The control group, which had not been exposed to the training, reflected stable scores, with no significant changes from the pre-intervention test measurements to the post-intervention test measurements (Table 1). The total mean score of Bull's Mental Skills Questionnaire increased from 100.6 to 119.8 and revealed a significant positive increase ( $p = .000$ ).

In the FFMQ, a statistically significant difference was found between the measurement scores of the experimental and control groups on "act with awareness" during the pre-intervention test ( $p = .040$ ). The experimental group had a significantly lower score than the control group. There were no significant differences between the scores of the two groups on the other factors measured during the pre-intervention test.

The experimental and control groups did not differ significantly from one another during post-intervention testing on the different measurements of the FFMQ. The significant difference that existed on the "act with awareness" construct during pre-intervention testing was not present during post-intervention testing. The reason for this is the fact that the score on "act with awareness" in the experimental group increased, but not enough for statistical significance. Within the experimental group only two significant changes from pre- to post-intervention testing were reported (Table 1). The construct "describe items" increased significantly ( $p = .028$ ) from the pre- to the post-intervention test scores. The "non-judge items" increased significantly ( $p = .011$ ) from the pre- to the post-intervention test scores.

Scores within the control group did not change from the pre- to the post-intervention testing. A change of the total mean score of the FFMQ from 119 to 131.9 indicated a statistical significant improvement ( $p = .038$ ) in the experimental group.

**Table 1:** Mean scores (standard deviation) for the experimental (EG) group and control (CG) group and results from the Wilcoxon signed-rank test

Questionnaire	Group	Pre-Intervention	Post-Intervention	<i>p</i>
Bulls Mental Skills - imagery	EG	17.714 (4.349)	18.316 (4.230)	.434
	CG	17.857 (2.797)	18.267 (3.261)	.589
Bulls Mental Skills – mental preparation	EG	18.381 (4.318)	19.429 (3.026)	.125
	CG	18.267 (3.693)	18.133 (3.335)	.590
Bulls Mental Skills – self-confidence	EG	14.000 (4.757)	15.571 (3.867)	<b>.017</b>
	CG	15.400 (5.054)	13.600 (3.180)	.108
Bulls Mental Skills – anxiety and worry management	EG	10.095 (4.711)	13.476 (5.400)	<b>.017</b>
	CG	12.067 (5.203)	12.000 (4.736)	.548
Bulls Mental Skills – concentration ability	EG	13.316 (4.498)	16.476 (5.202)	<b>.002</b>
	CG	15.357 (4.106)	16.333 (2.664)	.309
Bulls Mental Skills – relaxation ability	EG	12.857 (6.506)	16.381 (4.620)	<b>.002</b>
	CG	15.067 (4.877)	15.133 (3.889)	.523
Bulls Mental Skills - motivation	EG	14.667 (5.151)	18.190 (3.995)	<b>.002</b>
	CG	15.533 (4.051)	15.867 (2.800)	.725
FFMQ - observe	EG	27.050 (5.094)	28.667 (5.571)	.460
	CG	28.500 (5.019)	27.133 (6.255)	.108
FFMQ - describe	EG	28.000 (7.108)	31.143 (7.479)	<b>.028</b>
	CG	27.786 (6.290)	27.400 (6.231)	.893
FFMQ – act with awareness	EG	22.100 (5.748)	25.381 (4.822)	.107
	CG	26.200 (6.085)	26.643 (7.642)	.323
FFMQ – non-judge	EG	21.750 (6.592)	25.714 (5.746)	<b>.011</b>
	CG	23.933 (4.803)	24.133 (6.589)	.753
FFMQ – non-react	EG	20.100 (4.278)	21.048 (3.667)	.622
	CG	21.769 (3.140)	21.267 (3.863)	.858
SCAI-2 – state cognitive anxiety	EG	25.619 (5.962)	21.762 (5.558)	<b>.012</b>
	CG	26.933 (3.826)	24.417 (3.777)	.119
SCAI-2 – state somatic anxiety	EG	25.524 (7.672)	20.857 (6.770)	<b>.003</b>
	CG	22.933 (6.787)	22.143 (6.286)	.699
SCAI-2 – state self-confidence	EG	21.286 (7.695)	24.143 (6.429)	<b>.045</b>
	CG	21.333 (5.260)	21.231 (3.919)	.636

Note. The results from the Wilcoxon signed-rank test which include the mean scores of the experimental and control groups, standard deviation of pre- and post-intervention testing and *p* values. Bold *p* values indicate statistical significance.

As during pre-intervention testing, the scores of the experimental and control group were not significantly different during the post-intervention test using the CSAI-2. The experimental group displayed significant differences between pre-intervention test and post-intervention test scores on all three factors of the CSAI-2. Cognitive state anxiety ( $p = .012$ ) and somatic state anxiety ( $p = .003$ ) decreased significantly in the post-intervention test scores. The state self-confidence levels ( $p = .045$ ) also increased significantly from the pre- to the post-intervention testing. After the intervention, the experimental group seemed to have significantly lower anxiety levels, with higher self-confidence levels (Table 1). The control group, which did not undergo any intervention, did not display any significant changes in scores.

## Discussion

The primary aim was to evaluate whether the cross-over from Sport Psychology to the Psychology of Music was meaningful. Taking into account that 10 out of the 16 subscales that were measured improved significantly in the experimental group from the pre- to the post-intervention test, it can be argued that the cross-over was partially successful.

In the experimental group, a statistically significant difference was found between the pre- and post-intervention test scores on five of the seven subscales of Bull's Mental Skills Questionnaire (level of self-confidence, anxiety and worry management, concentration ability, relaxation ability and levels of motivation), as well as on the total score ( $p = .000$ ). The control group's scores were stable, with no significant changes between the pre- and post-intervention tests. This significant shift in the improvement on five of the seven subscales is a strong indication that the intervention program was effective. There was also a notable increase on "imagery ability" and "mental preparation", but the difference did not meet the statistical criteria for significance. This finding is in line with the results reported by Clark and Williamon (2011) regarding their research on undergraduate and postgraduate music students from a music conservatoire in the United Kingdom. Their research is the closest match to the current study in terms of the research design, the spectrum of psychological skills in the intervention program, as well as individual aspects of measuring instruments. The fact that psychological skills improved in both these studies support the claim that PST per se can improve the effectiveness of the psychological skills involved. From the performance-evaluative context of sport, there is stronger evidence in the available research that PST by itself can improve the efficiency of the psychological skills that form part of the intervention program (Edwards, 2007; Weinberg & Gould, 2007; Weinberg & Williams, 2006).

A significant difference between this research project and that of Clark and Williamon (2011) is the fact that the PST was combined with mindfulness (MAC approach) and the training was conducted in a mindful way. According to Kee and Wang's (2008) research, which observed a positive relation between mindfulness and the adoption of psychological skills in their research, opens the notion that mindfulness may facilitate the effectiveness of learning psychological skills. The effective combination of PST and mindfulness in this current study may strengthen the notion that the third wave of cognitive research may be beneficial in the training of psychological skills. In terms of mindfulness itself, the experimental group displayed two significant changes from pre- to post-intervention testing in the subscales "describe items" and "non-judge items" as measured by the FFMQ. A statistically significant improvement in the total score ( $p = .038$ ) (all the subscales combined) is a clear indication that there was a

positive shift in the mindfulness levels of the undergraduate music students. These changes are meaningful, because the control group that received no intervention displayed no significant changes in terms of mindfulness. The implication of the fact that these mindfulness dimensions were stronger after the intervention program can be an indication that the mindfulness training with a specific focus on the MAC approach contributed to this improvement. This finding is in line with that of a number of mindfulness intervention research projects that mindfulness training can improve mindfulness (Anderson, Lau, Segal & Bishop, 2007; Carmody & Baer, 2008; Chambers, Lo & Allen, 2008).

Taking into account the differences between Bull's Mental Skills Questionnaire and the FFMQ, it seems that the intervention program favoured the psychological skills in comparison with the mindfulness if the amount of significant changes in the two scales is compared. It is also reported in the literature that psychological skills can be acquired in a shorter period of time, unlike mindfulness (Edwards, 2007). The acquisition of mindfulness in everyday life, as well as the ability to employ mindfulness in a high performance setting may take a little bit longer to master than psychological skills. According to Kabat-Zinn (2007, 2008), the process of becoming mindful and acquiring the ability to harvest all the positive reverberations of mindfulness in all life contexts may take time, and there is no quick solution on the difficult road of learning to live a quality mindful life.

The unique combination of PST and mindfulness training in this intervention programme makes it difficult to pinpoint which of the two components was responsible for these significant changes in the experimental group. A complicating factor is the fact that mindfulness training can also have a significant impact on the improvement of cognitive abilities, such as the skills involved in this intervention program (Anderson *et al.*, 2007; Hodgins & Adair, 2010). It also opens up the possibility that PST can reinforce some mindfulness elements during training. However, mutual reinforcement and cross-pollination between PST and mindfulness cannot be ruled out completely, although no proof of either can be provided in this study.

The significant improvement of cognitive- and somatic anxiety subscales as measured by the CSAI-2 is also crucial for the undergraduate music student. It is important to this study to emphasize that music performance anxiety is a serious problem that does not only impair the quality of performance and a performer's psychological well-being, but can even result in the premature termination of a person's music career. The research of Yoshie, Kudo, Murakoshi and Ohtsuki (2009) on music performance anxiety in skilled pianists indicated that stage fright is a severe problem among pianists. Even among young adolescent musicians, the levels of distress and anxiety can be extreme and can have negative psychological ramifications. Fehm and Schmidt (2006) note that of the

74 adolescent participants they used in their study, almost one third reported that they were distinctly handicapped by their elevated levels of anxiety. Although the use of drugs and alcohol was rarely reported, most of the participants called for support and help from professionals outside the school to assist them with counseling to be able to cope more effectively with their anxiety problem.

The implication of the fact that such a substantial number of subscales showed significant shifts in the desired direction provides evidence that something meaningful happened during the intervention program and that the cross-over from Sport Psychology to the Psychology of Music and the combination of PST and mindfulness training with a specific focus on the MAC approach had a positive impact on the experimental group.

### **Conclusion and limitation of this study**

The positive results achieved in this research suggest that the cross-over from Sport Psychology to the Psychology of Music can be meaningful and the combination of PST and mindfulness training may be a more effective approach. This conclusion corroborates the findings of Bernier *et al.* (2009), who claimed that they effectively combined PST and mindfulness with a specific focus on the MAC approach in an effective intervention program for professional golfers. According to Bernier *et al.* (2009), this combination is a recent trend in cognitive behavioural research that is becoming increasingly visible in the research landscape of mainstream Psychology, as well as in research in the performance-evaluative contexts where high performance under pressure is investigated. This research forms part of a third wave research approach in an effort to improve the effectiveness and quality of PST (cognitive training) in conjunction with mindfulness training, particularly where acceptance and commitment form an integral part of the high performance context.

The statistically significant changes achieved on 10 of the 15 important subscales indicate that moderate success was achieved in this research and that the intervention program had a positive impact on the psychological dimensions that were tested.

A limitation of the study was the fact that a quasi-experimental design was implemented and that the experimental- and control groups were not selected randomly. However, the confounding variables that may affect the outcome of this study were identified as natural confounds as termed by Whitley (2001). These natural confounds are usually indicated as demographic characteristics such as sex, age or ethnicity. All the confounding variables that were tested in this study revealed the normal tendencies that are indicated in the literature. For example, it is interesting to note that the gender difference in terms of music performance anxiety that was detected in this study was also found in larger

music performance populations (Kokotsaki & Davidson, 2003). The total group (experimental- and control group) revealed homogenous results in the pre-intervention test, because there was no significant statistical difference between the measurements that were employed in this study between the experimental and control group, except for “act with awareness” where the same difference in ratio was detected in the post-intervention test.

A recommendation for future research pertaining to this dynamic interchange between the performance-evaluative contexts of sport is the fact that measuring instruments must be refined to the specific demands of the performance-evaluative situation. For example, more music-specific measurements are needed to determine if positive changes in terms of psychological skills were achieved. Closer research cooperation and the possibility of cross-pollination between different performance-evaluative contexts such as sport, music, dance, drama and other performing art forms must deliberately be sought in future research.

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610 Steyn, Steyn, Maree and Panebianco-Warrens

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*A cross-over from Sport Psychology to the Psychology of Music* 611

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