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### Coping With Performance Stress: A Study of Professional Orchestral Musicians in Canada

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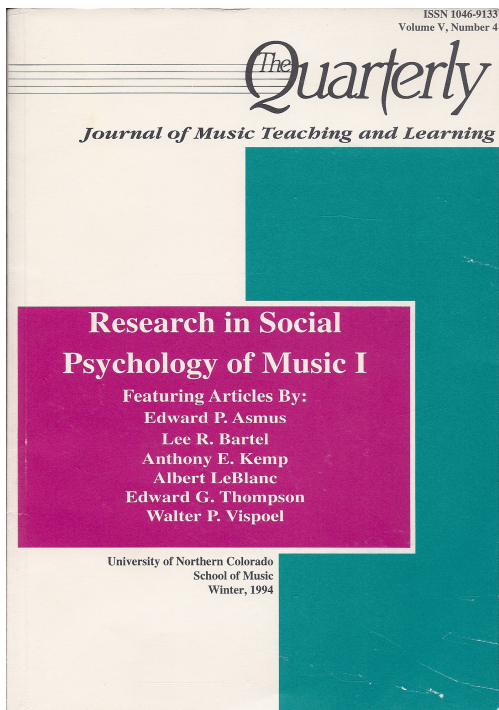
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*It is with pleasure that we inaugurate the reprint of the entire seven volumes of The Quarterly Journal of Music Teaching and Learning. The journal began in 1990 as The Quarterly. In 1992, with volume 3, the name changed to The Quarterly Journal of Music Teaching and Learning and continued until 1997. The journal contained articles on issues that were timely when they appeared and are now important for their historical relevance. For many authors, it was their first major publication. Visions of Research in Music Education will publish facsimiles of each issue as it originally appeared. Each article will be a separate pdf file. Jason D. Vodicka has accepted my invitation to serve as guest editor for the reprint project and will compose a new editorial to introduce each volume. Chad Keilman is the production manager. I express deepest thanks to Richard Colwell for granting VRME permission to re-publish The Quarterly in online format. He has graciously prepared an introduction to the reprint series.*

# Coping With Performance Stress: A Study Of Professional Orchestral Musicians In Canada

By Lee R. Bartel  
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Karasek and Theorell (1990) link persistent and recurrent occupational stress to psychological distress, physical morbidity and mortality. Occupational stress is widespread in both the U.S. (Kottage, 1989) and Canada (Geran, 1992). Studying ways of reducing occupational stress can make a useful contribution to public health.

Musicians consciously experience occupational stress in the form of performance anxiety (Hamann, 1980; Hutterer, 1980; Spencer, 1969). The potential effects on health can be substantial when performance is frequent, as it is for professional orchestral players, and attended by anxiety. Musicians' stress is usually time- and place-specific. Consequently, it can

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be anticipated, and coping strategies can be employed. Coping strategies are actions taken by individuals to deal with stress.

Many studies have been conducted about coping strategies used by the general public. Folkman and Lazarus (1980) and Pearlin and Schooler (1978), for example, compared strategies for different kinds of stress. Statistics Canada (1991) studied people over 44 years of age in Canada. These studies showed that:

- most people use multiple coping strategies;
- educated and affluent people make greater use of effective strategies; and
- occupational stress is less easy to deal with than interpersonal stress.

Occupational stress can have serious health consequences. Karasek, et al. (1988) linked high job strain, measured by low decision latitude and high psychological demands, with increased heart attacks in two national U.S. samples. The orchestral musician has low decision latitude and high psychological demands. Music performance is, therefore, a high-strain job (Karasek & Theorell, 1990, p. 212). Not only are orchestral musicians required to follow the conductor and principal, but they are expected to perform flawlessly.

The potential effects on health can be substantial when performance is frequent, as it is for professional orchestral players, and attended by anxiety.

Most musicians (96 percent) reported experiencing stress related to performance.

Musicians in the Karasek and Theorell study (1990, p. 213) had age-adjusted mean systolic blood pressure at-work scores of 130. This was higher than those of waiters and air traffic controllers — two well-known high-stress jobs. Thus, it is important to study the coping strategies of orchestral musicians to determine those that are most effective in reducing stress, without harmful health outcomes, to promote the health of this high-stressed group.

The purpose of this study was to inquire into the presence of stress among orchestral musicians, the symptoms of that stress, the coping strategies employed to deal with the stress, the effectiveness of the chosen coping strategies, and health outcomes related to those strategies.

## Method

### Design of the study

In this cross-sectional study, we focused on the membership of the Organization of Canadian Symphony Musicians (OCSM — Membership  $N=973$ ) in the 19 major professional orchestras in Canada. To obtain a sample of volunteer participants in the study, the January, 1992 *OCSM Newsletter* contained the questionnaire and the study's rationale. The OCSM delegate in each orchestra distributed the *Newsletter* to each member of his or her orchestra. Delegates were asked to encourage completion of the questionnaires, which were collected and mailed to the investigators. As a follow-up technique, an executive member of OCSM contacted the delegates to encourage return of the completed questionnaire.

### Instrument

The researchers created the questionnaire on the basis of a discussion with a focus group of musicians from the Toronto Symphony Orchestra and with reference to earlier research (Brantigan, 1973; Hamann, 1980; Hutterer, 1980; Leglar, 1978; Robbins et al., 1991; Spencer, 1969; Sweeney, 1981; Terwilliger, 1972). The instrument consisted of:

1. open-ended and closed-ended questions about stress symptoms;
2. a list of over 40 coping strategies requiring a categorical use/nonuse declaration plus a frequency of use response;
3. open-ended questions about preferred helpful strategies;
4. questions about the effectiveness of strategies indicated on a 5-point Likert-type scale;
5. questions about perceived health (a single item 5-point rating scale) and well-being (a set of 11 items with 3-point rating scales) used in a recent national study (Stephens & Craig, 1990); and
6. social and music background questions.

We pilot-tested the questionnaire with a non-professional adult community orchestra. Professionals translated the questionnaire into French for use in Québec.

### Analysis

Data were analyzed through the SYSTAT (Wilkinson, 1988) statistical analysis package. Differences in frequency data were analyzed with chi-square and in rating data with ANOVA. Significance level was set at .05. In most cases, however, specific probability of error levels is indicated.

## Results

### Response rate

The researchers received completed questionnaires from 204 volunteer respondents, approximately 20 percent of the population. Although this sample was somewhat smaller than desired, the responses were representative on most factors. Responses included musicians:

- in small, medium and large orchestras in the major regions and provinces of Canada;
- in all orchestral sections (somewhat more woodwind and brass players responded than proportional to the population);
- of all age groups;
- of both genders; and
- who speak either French or English.

The response from principal players was higher than the population proportion. It is

**Table 1**Characteristics of Respondents

(n = 204)

Characteristic	Percentage of Sample	Characteristic	Percentage of Sample
<b>Gender</b>		<b>Size of Orchestra</b>	
Male	56	Small < 30	9
Female	44	Medium	51
Total	100	Large 61+	40
		Total	100
<b>Instrument</b>		<b>Section Position</b>	
String	54	Principal	34
Brass	21	Member	66
Woodwind	22	Total	100
Percussion	3		
Total	100		
<b>Age</b>			
< 30	16		
30s	50		
40s	24		
50s+	10		
Total	100		

possible that those musicians particularly subject to performance anxiety were highly motivated to respond to the questionnaire. The design of the questionnaire attempted to counter this possibility. The person not experiencing performance anxiety needed only a few minutes to complete the basic data questions, while the person experiencing anxiety needed more time to list symptoms and coping strategies. Caution must be exercised, however, in generalizing the data from this study to the whole population of orchestral musicians. Table 1 shows the distribution of responses by background characteristics.

### **The Presence of Stress**

Most musicians (96 percent) reported experiencing stress related to performance. No significant difference (chi-square at alpha .05) was evident in experience of stress on the basis of sex, instrument, time with orchestra, principal/non-principal status, additional teaching/playing, or size of orchestra. The stress experienced differed according to age group. Musicians under forty and those over fifty experience more stress than those

in their forties ( $p \leq .004$ ). Of those musicians who reported experiencing stress, 85 percent stated that they engaged in specific action to cope with it. The only grouping variable showing an effect on the choice to use coping strategies was "instrument." Brass and woodwind players were more likely to do something about their stress ( $p \leq .03$ ).

### **Symptoms of Stress**

Musicians reported physical and mental symptoms of stress experienced during the past 12 months as a result of performance. Table 2 lists the symptoms reported by more than 10 percent of musicians. Some variation by sex was found among stress symptoms. Women reported more chills ( $p < .001$ ) and diarrhea ( $p < .001$ ), while men reported more general nervousness ( $p \leq .009$ ). Some difference existed among instrumental sections in symptoms reported. The proportion of women was much lower in brass and higher in woodwinds than in strings. Consequently, interaction between sex and instrument is evident. Independent of sex, however, significant differences occurred between string

**Table 2**Percentage of Musicians Reporting Particular Symptoms

Symptom	Percentage Reporting	Symptom	Percentage Reporting
Increased Heart Rate	58.7	Coordination Problems	21.4
Concentration Problems	45.8	Abdominal Problems	20.9
Panic	36.3	Diarrhea	20.4
Tremors	35.8	Worry	19.9
Muscle Aches & Spasms	35.3	Lack of Confidence	14.4
Chills	32.8	General Nervousness	12.4
Breathing Problems	23.9	Troubled Sleep	11.9
		Irritability	11.4

Note: Multiples reponses were accepted.

players and wind players (brass and woodwind), with string players being less troubled by increased heart rate ( $p \leq .01$ ), breathing difficulties ( $p < .001$ ), dry mouth ( $p \leq .003$ ), and lack of confidence ( $p \leq .003$ ).

### **Coping Strategies Used**

People use coping strategies as a part of a general life-style to deal with stress from various sources. Some of these strategies may contribute to performance stress reduction. Other strategies are consciously used for music performance. Respondents indicated both types of uses. Because the researchers focused on music performance, coping strategies that were not used for purposes of music performance were categorized as general life-style strategies. A few musicians listed "rehearsal" or "warm-ups" as general life-style items. The reason for this may be that practicing their instrument is so much a part of their daily lives as musicians that it is done simply to maintain their musical abilities and identity.

The most frequently mentioned strategies are listed in Table 3. Some decrease in use is evident in comparing columns two (past

and present use combined) and three (present use only). For example, only 28.9 percent have used beta blockers during the last 6 months, although 37.7 percent have used them at some time. The 8.8 percent change is largely explained by comments on the questionnaires. Beta-adrenergic blocking compounds (commonly simply known as beta blockers) are prescription drugs such as propranolol (trade name Inderal), pindolol, or nadolol, used extensively for treatment of hypertension. In this study, the most commonly used was propranolol. (For a more extensive description see Wilson, 1986). Some musicians found the drug detrimental to performance and discontinued use. Most strategy use is stable, indicating that musicians have found particular strategies useful or, at least, have habituated use.

Table 3 lists strategies used, but to avoid data clutter, not frequency of use. Frequency, however, is particularly important to note with some strategies. Although 28.9 percent of respondents used beta blockers, 58.3 percent used the drug less than once a

**Table 3**

Coping Strategies Employed in General Life-Style and Specifically for Music Performance in Past and Present

Strategy	Past & Present Use		Present Only
	General Life-Style (%)	Music Performance (%)	Music Performance (%)
Music - rehearsal	1.0	70.1	70.1
Music - warm-ups	2.0	64.7	64.2
Music - listening	5.9	40.7	40.6
Avoid certain foods	19.6	34.3	33.3
Humor	17.2	32.8	31.9
Beta Blockers	.5	37.7	28.9
Affirmation	3.4	27.5	26.5
Breathing Exercises	2.0	27.9	26.5
Exercise	27.9	21.1	21.1
Visualization	2.9	23.0	20.1
Massage	7.8	20.6	18.1
Hobbies	27.4	17.7	16.2
Alcohol	33.8	9.8	9.3
Multi-vitamins	25.4	9.3	9.3

Note: Multiple responses were accepted.

month and 11.7 percent only about once a month. Only 18.3 percent of the beta blocker users indicated use of more than 2 times a week. Other strategies like affirmation, food avoidance, and rehearsal to a particular level of proficiency were used for all performances.

#### **Effectiveness of Coping Strategies**

Respondents listed many strategies in the open-ended questions asking for preferred ways of coping with stress plus an effectiveness rating of the listed strategy on a 5-point scale. To allow us to rate effectiveness, we combined some strategies into broad categories and calculated mean ratings. "Music preparation" included warm-ups, rehearsal to adequate level, slow practice, listening to specific music, listening to recordings, practicing more difficult material, sight-reading work, playing for peers, and assuring the best possible instruments. "Mind control" included concentrating on hearing music before playing, concentrating on the physical movement of playing, calming the mind, blocking out the audience, meditation, Silva

Method (Silva & Goldman, 1988) self-hypnosis, and spiritual exercises of Eckankar.

"Positive attitude" included psychological boosting, keeping performance in perspective, ignoring the conductor, being emotionally detached, psychotherapy, affirmation, and humor.

Table 4 shows the rank ordering of strategies by effectiveness. Beta blockers, exercise, and music preparation were considered the most effective strategies. A combination of strategies was evident in the responses. Musicians frequently combined music preparation with such strategies as mind control and positive attitude. Increased effectiveness by combination was not assessed.

Because performance stress is specific to certain music and audiences, individual coping strategies are used for different situations. Respondents were asked to indicate the situations in which they used preferred strategies. Table 5 shows the percentage of strategy users who used each strategy for solo performance, group performance, or rehearsal. The most situation-specific were



**Table 4**Effectiveness of Preferred Coping Strategy in Reducing Anxiety

Strategy	Percentage Reporting Use	Effect Rating*	S.D.
Beta Blockers	26.0	4.4	.6
Exercise	11.8	4.1	.7
Music Preparation	50.0	3.9	.8
Mind Control	30.4	3.8	.8
Relaxation Tech.	32.8	3.7	.9
Positive Attitude	22.5	3.7	.8
Eating Habits	9.3	3.6	.7

\*Effectiveness rated between 1 = not effective, 5 = completely effective

Note: Multiple responses were accepted

**Table 5**Percentage of Users Using Strategies for Specific Situations

Strategy	Solo Performance	Group Performance	Rehearsal
Exercise	70.8	91.7	62.5
Beta Blockers	83.0	52.8	15.1
Eating Habits	63.2	73.7	10.5
Mind Control	83.9	83.9	56.5
Music Preparation	79.4	90.2	74.5
Positive Attitude	63.0	82.6	65.2
Relaxation Tech.	76.1	85.1	40.3

Note: Multiple Responses were accepted.



Musicians occasionally try to cope with stress in a way that proves useless or even detrimental to their performance. . . .Over-practice leads to sore muscles, tendonitis, mental fatigue. . . .

beta blockers. Consequently, they were used most extensively for solo performance and hardly at all for rehearsal. Orchestra musicians were primarily involved with group performance, and this priority was reflected in the finding that strategies were mostly used for group performance.

Musicians occasionally try to cope with stress in a way that proves useless or even detrimental to their performance. Respondents were given an opportunity to identify such strategies and to rate their harmful effects. Table 6 lists the four most frequently mentioned: music rehearsal, other substances, alcohol, and beta blockers. Because musicians are expected to play flawlessly, they tend to focus considerable effort on preparation. Occasionally this normally helpful strategy can be overdone and then it becomes harmful. Over-practice leads to sore muscles, tendonitis, mental fatigue, and so on. This was the strategy that resulted in the greatest difficulty for performance.

"Other substances" includes cannabis, sleeping aids, pain killers, tranquilizers, too much cough medicine, and so on. These substances are sometimes used to cope with physical ailments and are then found to have a detrimental effect on performance.

Respondents listed beta blockers as both useless and harmful. For some respondents, the beta blocker simply eliminated the bodily stress reaction but the mental problems remained. Respondents indicated a large range of beta blocker dosage: from 2.5 mg to 40 mg. The majority used small doses of around 10 mg. Even users who found the drug helpful reported some negative side effects. The most common side effect is reduced emotional involvement with the music. Other side effects include dry mouth, concentration problems, a feeling of psychological dependency, and stomach problems. For some musicians these negative side effects outweighed the positive effects.

Table 7 lists the most commonly reported

strategies for dealing with accumulated stress after performance. The most common means of 'unwinding' after a performance was the use of alcohol. The most effective was distraction. The strategy here involved changing mental focus or occupying the mind with something other than performance. Most favored watching TV, but hobbies, reading, and puzzles are also used. Strategies were frequently combined. The most typical combination included alcohol, socializing, and eating. Most respondents rated this combination highly effective.

### Health Outcomes

Overall mean scores on reported health measures (Stephens & Craig, 1990) were 1.7 on a scale of 1-5, on the single item self-rated health status (where 1 is very good and 5 is very poor), and 22 for emotional well-being (11 items rated 1-3 where 11 is the lowest score and 33 is the highest). These scores vary little according to background factors. These results are not unusual, given that most people tend to rate their health quite highly into their senior years (Stephens & Craig, 1990, p.69), and well-being scores do not vary much between 25 and 65 years of age, or by gender within those years (Stephens & Craig, 1990, p.72)

The use of some coping strategies is related to reported health, as is shown in Table 8. Exercise, meditation, rehearsal, and psychotherapy are related to perceived physical health status. Participation in psychotherapy is related to emotional well-being. The use of beta blockers is not significantly related to either measure of health in this study.

### Discussion

While the use of a volunteer sample of only 20 percent of the population makes drawing any firm conclusions difficult, we are able to draw a few conclusions. First, the professional orchestral musician's occupation is extremely stressful. A higher percentage of musicians report experiencing stress than do workers in major occupational categories in

**Table 6**  
Harmful Coping Strategies

Strategy	Percentage Reporting Use	Effect Rating*	S.D.
Music Rehearsal	7.8	3.7	.7
Other Substances	5.9	3.6	1.1
Alcohol	9.8	3.4	.7
Beta Blockers	8.3	3.2	1.0

\* Negative effect rate: 1- no effect, 5 = could not play

Note: Multiple responses were accepted.

**Table 7**  
Coping Strategies Used to Deal with Accumulated Stress After Performance

Strategy	Percentage Reporting Use	Effect Rating	S.D.
Distraction (e.g. TV)	11.3	4.3	.8
Alcohol	21.6	4.2	.9
Socializing	11.8	4.2	.6
Relax	6.4	4.2	.9
Exercise	5.4	4.1	.6
Eat	4.9	4.0	.7

\* Effect rated: 1 - no effect, 5 = completely effective

Note: Multiple responses were accepted

**Table 8**  
Use of Coping Strategies and Self-Rated Health and Well-Being

Strategy	Perceived Health		Rated Well-Being	
	Use	Not Use	Use	Not Use
Exercise	1.5	1.7*	25.0	24.5
Meditation	1.4	1.7*	25.3	24.6
Musical-rehearsal	1.5	1.8*	24.9	24.3
Psychotherapy	2.1	1.6*	22.8	24.9*
Beta Blockers	1.5	1.7	24.4	24.8

Health rated: 1 = very good; 5 = very poor. Mean ratings reported.

Well-Being rated: positive maximum = 33.0. Mean ratings reported.


\* Difference significant at alpha = .05

Canada (Geran, 1992). In addition, this stress has probably been enhanced recently because the cut-backs in arts funding have left some orchestras threatened with bankruptcy.

Secondly, musicians are following the recommended pattern of using a wide variety of coping strategies, though only a few of these are considered very effective for reducing anxiety about playing. A few of these strategies were related to higher levels of self-rated health. Since other research has shown them to be related to positive health outcomes (Robbins et al., 1991), their use will likely be beneficial.

Third, while beta blockers are considered to be the most effective coping strategy, some musicians did report specific negative health and performance effects, but they are not detrimental to reported health on the general Stephens & Craig (1990) rating instrument. Given their infrequent and specific use they may not constitute a health problem at all for those musicians who find their use acceptable and helpful.

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