Perceived Importance of Components of Asynchronous Music during Circuit Training.

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Abstract

This study examined regular exercisers' perceptions of specific components of music during circuit training. Twenty-four men (38.8 years, *s* = 11.8 years) and 31 women (32.4 years, *s* = 9.6 years) completed two questionnaires immediately after a circuit training class. Participants rated the importance of 13 components of music (rhythm, melody, etc.) in relation to exercise enjoyment, and each completed the Affect Intensity Measure (Larsen, 1984) to measure emotional reactivity. Independent *t* tests were used to evaluate gender differences in perceptions of musical importance. Pearson correlations were computed to evaluate the relationships between affect intensity, age and importance of musical components. Consistent with previous research and theoretical predictions, rhythm response components (rhythm, tempo, beat) were rated as most important. Women rated the importance of melody significantly higher than did men, while men gave more importance to music associated with sport. Affect intensity was found to be positively and significantly related to the perceived importance of melody, lyrical content, musical style, personal associations and emotional content. Results suggest that exercise leaders need to be sensitive to personal factors when choosing music to accompany exercise. Qualitative research that focuses on the personal meaning of music is encouraged.

Keywords: Affect Intensity, Enjoyment, Melody, Personal Meaning, Rhythm.

Introduction

The past decade has witnessed a surge of interest in the scientific study of music in sport and exercise settings (Crust & Clough, 2006; Karageorghis, Jones, & Low, 2006; Priest, Karageorghis, & Sharp, 2004). Given that music is an integral part of group exercise classes (e.g. aerobics, circuit training, Spinning®) there is clearly merit in understanding how it can influence participant behaviour, feelings and cognitions. Evidence suggests that music must be carefully selected to match the requirements of both the activity and the characteristics of the individual or group to have a significant impact on factors such as enjoyment or work output (Atkinson, Wilson, & Eubank, 2004; Crust & Clough, 2006; Karageorghis, Terry, & Lane, 1999; Priest, et al., 2004). It appears that music can influence psychophysical functioning through at least three mechanisms: attentional narrowing (dissociation effect), alterations in arousal, and synchronisation (Karageorghis & Terry, 1997). From an applied perspective it is imperative that researchers attempt to identify what is the right music for specific exercise settings, groups and/or individuals. The present research aimed to identify the components of asynchronous music that circuit training participants perceived to be most important in determining exercise enjoyment, and to evaluate if these perceptions were related to personal factors or emotional reactivity.

In their conceptual model of motivational asynchronous music (i.e., background music where there is no conscious effort to synchronise movement with musical tempo), Karageorghis et al. (1999) highlight both musical components which determine the motivational qualities of selections and outcomes related to the use of motivational music. It was proposed that the motivational qualities of music are determined by both music factors (structural elements inherent to the music) and personal factors that reflect individual interpretations. This model suggests motivational music (music that

stimulates or inspires physical activity) can influence levels of arousal, mood, ratings of perceived exertion, and subsequently exercise adherence (Karageorghis et al., 1999).

Four factors are shown to contribute to the motivational qualities of a selection; namely rhythm response, musicality, cultural impact and association. The hierarchical structure of the model identifies music factors as more important than personal factors in determining the motivational qualities of selections. Rhythm response represents the stimulating qualities of rhythm and tempo, and there is strong support for rhythm response being the most important component of motivational asynchronous music (cf. Simpson & Karageorghis, 2006).

The second music factor in the Karageorghis et al. (1999) model, musicality, refers to the response to pitch-related elements such as harmony (how the notes are combined) and melody (tune). Interestingly, Lucaccini and Kreit (1972) proposed that affective states were more likely to be altered by harmony and melody, while rhythmical factors were proposed to influence bodily responses. Douglas (1985) also suggested that listener interpretation and mood are shaped by factors such as harmony and melody, although this aspect of the conceptual model has received little attention.

Two personal factors (cultural impact and association) are deemed important in relation to the motivational qualities of music. Cultural impact reflects the pervasiveness of a selection within society, whereas extra-musical associations, such as associations with sport and exercise, are proposed to evoke memories or thoughts that promote physical activity. These personal factors were deemed less important than music factors in determining the motivating qualities of a musical selection.

Although some researchers have found good support for the hierarchical nature of the conceptual model (Atkinson et al., 2004), others have suggested that the relative importance of musical components might vary in relation to personal and task-related characteristics (Crust & Clough, 2006). Furthermore, recent qualitative research

(Bishop, Karageorghis, & Loizou, 2007) concerning the use of music by young tennis players, found that factors such as extra-musical associations and lyrical content were perceived as important in eliciting emotional responses and altering mood and arousal. Intuitively it would seem likely that the importance that exercisers attach to rhythmic components is going to be greater in activities where the pace of exercise and musical tempo are to be synchronised.

To operationalise their own conceptual model, and to aid the selection of motivational music by researchers and practitioners, Karageorghis et al. (1999) developed the Brunel Music Rating Inventory (BMRI). This 13-item inventory reportedly possessed adequate psychometric properties, attracted support as a useful aid to selecting motivational music (Szabo & Griffiths, 2003), and has since been used in numerous research investigations (Atkinson et al., 2004; Crust, 2004; Crust & Clough, 2006; Elliot, Carr & Savage, 2004). However, a number of concerns were raised about the BMRI (cf. Crust & Cough, 2006; Karageorghis, Priest, Terry, Chatzisarantis & Lane, 2006) which related to both the factor structure of the inventory and the validation process. Research revealed that participants had problems with interpreting specific items on the BMRI such as harmony, and date of release while other items such as chart success, were deemed to be irrelevant (Karageorghis et al., 2006b).

To overcome problems associated with the original BMRI, Karageorghis et al. (2006b) developed the BMRI-2, a 6-item inventory that possesses stronger psychometric properties and appears to be easier to use and more applicable to exercise participants. While this development appears promising, there remain concerns in relation to the BMRI-2. Karageorghis et al. (2006b) justify the removal of items relating to the personal response to motivating music, due to being inappropriate for objective measurement. The authors acknowledged the limited scope of the BMRI-2, and suggested that additional qualitative methods might be necessary to aid the optimal

selection of motivational music. Karageorghis et al. provided an additional framework of criteria that are not explicitly included within the BMRI-2.

Participant responses to, and preferences for music are undoubtedly influenced by personal factors (cf. Crozier, 1997; Kemp, 1997) and the subjective interpretation of music. As such, it is unlikely that the effects of music in sport and exercise contexts can be fully evaluated and understood by reducing interpretations to a single numerical score via a 6-item questionnaire such as the BMRI-2. Furthermore, a number of factors that have been rated as highly important in influencing exercise performance, such as lyrical content, ability to evoke imagery and extra-musical associations (Gfeller, 1988) and factors of theoretical importance such as familiarity (North & Hargreaves, 1997) are not included in the BMRI-2.

A good deal of effort appears to have been devoted to understanding the 'right' music in relation to tempo, with Karageorghis et al. (1999) proposing that motivational music is characterised by strong rhythm, and fast tempi of 120 bpm^{-1} or above. However, Crust and Clough (2006) encouraged more effort to determine which musical components are more important in achieving specific outcomes. Tenenbaum et al. (2004) suggested that melody and rhythm were more important than lyrical content in diverting attention from aversive stimuli during high intensity running. These researchers also stressed the importance of personal meaning and personal associations in producing distraction from pain.

Karageorghis et al. (2006b) suggest that motivational music might influence exercise enjoyment and adherence, as well as influencing frequency, intensity and duration of exercise behaviour. On this basis, it is possible that the term motivational music might represent an over-simplification, as it is acknowledged that different musical properties may separately influence mood, attention and arousal (Karageorghis et al.). It is also possible that music which enhances mood and promotes positive

affective states would not necessarily stimulate physical activity (Karageorghis et al.). Given the potential importance of the relationship between enjoyment and exercise adherence (Cervone, Kopp, Schaumann & Scott, 1994) there appears to be a need to focus more precisely on the importance of musical properties in promoting increased enjoyment, as these are not necessarily the same as the properties of motivational music.

Little attention has been devoted to the importance of personal factors in the extant literature. However, Priest et al. (2004) investigated the influence of gender and age, and found female exercisers rated the importance of music more highly than males. However, in contrast to the previous findings of Karageorghis et al. (1999) women were not found to have a greater preference for the rhythmical components of music. Overall, Priest et al. report a trend for females to experience more enhanced affective states as a result of listening to music during exercise. Given that gender differences might also exist in relation to the perceived importance of music in exercise settings (Priest et al., 2004) or to the relative importance men and women attach to various musical factors (cf. Karageorghis, 1999), such differences clearly need to be explored. In relation to age, Priest et al found older participants preferred quieter and slower music.

One important factor that has often been overlooked by music psychologists (cf. Kemp, 1997) and has been shown to influence both musical preferences (Daoussis & McKelvie, 1986; Kemp, 1997) and responsiveness to musical selections (Crust & Clough, 2006) is personality. Crust and Clough hypothesised that more emotionally sensitive individuals would experience stronger responses to musical selections containing musicality (harmony and melody) than to an edited rhythm response condition of identical tempo that was lacking any harmony or melody. This line of reasoning also had theoretical underpinning from music theorists who suggested that harmony and melody were likely to influence mood and affective states (Douglas, 1980; Lucaccini & Kreit, 1972). Results of an isometric weight-holding task supported this

hypothesis, with a positive correlation found between sensitivity and responsiveness (weight-holding endurance) to the harmonic and melodic aspects of a motivational popular music selection. In contrast, more tough-minded (less sensitive) participants appeared to be little influenced by musicality factors; for these individuals rhythm response was most important in determining endurance response. These results appeared consistent with the work of Hargreaves and Colman (1981) who found individual differences in adult music listening styles, with some participants characterised by a more 'objective-analytic' listening style (focus on structure), while others exhibited more 'affective' listening (focus on emotional content).

There were three aims in the present research: First, to provide a further test of the hierarchical structure of the conceptual model of Karageorghis et al. (1999) by establishing participant perceptions of the importance of musical components. It was hypothesised that musical properties that are thought to influence affect (i.e. melody, lyrics) would be perceived to be as important as rhythmical components in determining exercise enjoyment.

The second aim of this research was to explore the role of individual characteristics and specifically the relationship between the importance participants attach to musical properties and affect intensity. This construct refers to stable individual differences in response intensity to a given level of emotion-provoking stimuli (Larsen, et al., 1986). Individuals high in affect intensity are known to be under-aroused at baseline (Larsen et al., 1986) and have been shown to employ a number of cognitive operations (which includes selectively focusing on emotional stimuli) to amplify emotional responses because of a desire to increase levels of arousal (Larsen, et al., 1987). Some researchers such as Cooper and McConville (1993) have questioned the validity of the construct and suggested affect intensity can actually be more parsimoniously explained as a mixture of trait neuroticism and extraversion. However,

such arguments are not convincing given that neuroticism and extraversion together predict less than 30% of the variance in measures of affect intensity (cf. Schimmack & Diener, 1997). In a series of studies evaluating affective responses to both real and hypothetical situations, Schimmack and Diener (1997) provided strong evidence to suggest that affect intensity is a valid construct and cannot be reduced to extraversion and neuroticism. Researchers have suggested that music can elicit deep and profound emotions within individuals (Hargreaves & North, 1997). Based on this and the research findings of Larsen et al. (1987) it was hypothesised that participants with higher levels of affect intensity would rate the musical properties thought to influence affect (melody, lyrics etc.) as more important than those with low affect intensity.

Finally, this research aimed to further explore the role of personal factors such as gender and age, which might influence the importance participants give to specific components of music. Following the work of Karageorghis et al. (1999), it was hypothesised that women (compared to men) would rate rhythmical components of music as more important for circuit training exercise. In line with Priest et al. (2004) it was proposed that older participants would rate temporal factors as less important than younger participants.

Method

Participants

The sample consisted of 55 participants (24 men and 31 women) who all regularly attended a weekly circuit training class in the north of England. The age of the participants ranged from 19 to 68 years, with the mean age of men (38.8, *s* = 11.8 years) found to be higher than women (32.4, *s* = 9.6 years). All participants read and signed informed consent forms prior to completing questionnaires. Participant details concerning attendance were collected at the same time as informed consent forms were

being signed. This research conformed to the ethical guidelines required by York St. John University's ethics committee. Only participants who had regularly attended the mixed (aerobic and muscular endurance) circuit class for at least 6 months were included.

Instruments

Musical Importance

To measure the perceived importance of musical components in circuit training, a list of items of theoretical importance were prepared specifically for use in this investigation. Given that this research was aimed at participant perceptions of the general importance of musical properties (i.e. rhythm, melody, lyrics) in determining exercise enjoyment during circuit training exercise, it was decided not to use existing instruments that were designed to measure the motivational qualities of specific selections. The relevance of the 13-items contained within the original BMRI (Karageorghis et al., 1999), the 6-items contained in the BMRI-2 (Karageorghis et al., 2006b), and other items which reflected important elements of musical selections identified within the literature but not covered in the two stated inventories, were assessed by the author and two circuit training instructors.

Given that the content validity of the BMRI-2 has received good support (Karageorghis et al., 2006b), it was decided that the six components contained in the questionnaire (rhythm, style, melody, tempo, sound of instruments and beat) would be included in the present investigation. In a qualitative appraisal of the original BMRI (cf. Karageorghis et al., 2006b), participants expressed concerns about a number of items, which included chart success, date of release, harmony, and danceability. As such, these items were not included in this study. However, Karageorghis et al. (2006b) suggests that other factors which were deemed problematic, were theoretically relevant, and as

such the following items from the original BMRI are included in this investigation (association of music with sport, lyrical content, familiarity, and the artist). Finally, previous researchers and theorists have highlighted the potential importance of (1) music which generates imagery (Bishop et al., 2007; Gfeller, 1988), (2) music which has personal associations or meaning (Bishop et al; Gfeller; Karageorghis et al., 2006b; Tenenbaum et al., 2004), and (3) the emotional qualities of music (Bishop et al; Crozier, 1997; North & Hargreaves, 1997), so these three items were added to the previous ten items to establish 13-items that participants would be required to rate. The content of the questionnaire was discussed and agreed with two circuit training instructors who were Register of Exercise Professionals (REPS) Advanced Level Circuit Training, and Fitness Training Instructors, who deemed the items to be appropriate in selecting music for circuit training and easily comprehensible.

In line with other questionnaire-based research into music use in exercise settings (Priest et al., 2004), and consistent with the design of the BMRI-2, a seven-point Likert scale with verbal anchors of 1 (not at all important) and 7 (extremely important) was used for the 13 items in this study. Since previous researchers have identified that non-music experts find it difficult to differentiate between certain musical terms such as rhythm and tempo (Karageorghis et al., 2006b), the following definitions of musical terms are forwarded which applied in this study: *tempo* was considered to reflect the speed of the music; *rhythm* referred to the repetitive pattern that occurs throughout the music; and *beat* referred to the pulse of the music. The written instructions to participants read as follows:

> Take a few moments to think about the music that is played during circuit training. Please rate the importance of the following musical factors in relation to producing greater **enjoyment** during circuit training. There are no right or

wrong answers: it is your opinion that counts. The factors that *you* deem *most important* in relation to **enjoyment** should be given higher ratings.

Affect Intensity

To determine levels of emotional reactivity, the Affect Intensity Measure (AIM- Larsen, 1984) was completed by each participant. This 40-item inventory assesses the characteristic intensity with which an individual typically experiences emotions. Items are rated on a 6-point scale, with verbal anchors ranging from (1) never, to (6) always, with scoring achieved by averaging the responses across the 40-items. Larsen (1984) reported high coefficient alpha (Cronbach, 1951) for the AIM across four samples ($\alpha \geq 0.9$). With respect to construct validity, Larsen reported a significant correlation ($r = 0.5$, $P < 0.01$) between Affect Intensity and reports of typical affect response intensity by the parents of participants. Tests of stability (test-retest correlations) after 1-, 2-, and 3 months were found to be 0.8, 0.81 and 0.81 respectively. Larsen et al. (1986) reports that across several samples, the AIM has been found to correlate most consistently with sociability, arousability, and emotionality. There is also evidence to suggest that participants with high affect intensity are under-aroused in quiet, stimulus reduced environments (Larsen et al., 1986).

Procedures

The instructor of a large circuit training class ($N > 100$) was approached in order to gain permission to solicit volunteers. The circuit training class included both cardiovascular and muscular endurance exercises focusing on the major muscle groups (i.e. abdominals, legs etc.) with 10 stations, and 3-4 exercises per station to allow for differentiation in ability. Some of the stations used in the circuit class involved the use of free weights. This class was deemed appropriate for study because of the use of background music which was obtained from a specialist music subscription company

(i.e., the CDs were representative of music that many other exercise classes would also use). The music played during this circuit training class was of a fast tempo (all selections > 120 bpm^{-1}), and included pop, rock and dance music selections. The instructor gave permission for participants to be approached and allowed the author to address the group prior to a circuit training class. Altogether, 55 volunteers agreed to participate. Participants read, and signed informed consent forms prior to completing a booklet containing a copy of the 13 items relating to musical importance and the AIM (Larsen, 1984) questionnaire. Completed booklets were placed into envelopes, sealed and collected by the instructor or the author.

Data Analysis

For the first aim of this study, participant perceptions of the importance of musical properties for exercise enjoyment were rank ordered and compared to the hierarchical structure reported in relation to motivational music (Karageorghis et al., 1999). Second, a correlation matrix was produced (Pearson correlations) to determine any relationships between affect intensity, age, and the importance reported for specific musical properties. Pearson correlations were used rather than regression analysis due to the size of the sample. Employing a regression analysis, with music items as predictor variables and affect intensity as the dependent variable, would have required a significant number of additional participants from other circuit training classes. Although this approach would have allowed a more sophisticated statistical analysis of the data, it would also likely have compromised experimental control (i.e. different circuits, exercises, music played, participant characteristics etc.). Finally, a series of independent *t* tests were used to test for differences in the importance which male and female participants ascribed to the 13 musical components. Tests of normality were conducted to ensure the assumptions for use of parametric statistics were met.

Results

Table 1 presents the descriptive data for perceived musical importance in relation to enjoyment in circuit training exercise. Participants perceived rhythm response components (tempo, beat, and rhythm) as being of greatest importance. Other than familiarity, all other items that represented cultural impact or associations (personal factors) on the original BMRI were rated as being of low importance in relation to circuit training exercise. When normality of the data was assessed using measures of skewness and standard kurtosis, two variables; namely perceived importance of beat, and perceived importance of rhythm, were found to demonstrate a leptokurtic distribution (kurt.>1.96). Accordingly, these data was not analysed using parametric statistics. In accordance with Priest et al. (2004) who used a similar scale measure of importance of music and also found a leptokurtic distribution, data for these two variables was down-graded to nominal level and gender differences analysed using a non-parametric statistic (chi square). Non-parametric correlations were not performed with these two variables as the data was deemed inappropriate for ranking.

Affect Intensity

A number of significant Pearson correlations were evident when testing the relationship between affect intensity and perceived importance of musical components. Affect intensity was found to be positively related to perceived importance of melody (r = 0.33, $P < 0.02$), musical style ($r = 0.38$, $P < 0.02$), lyrical content ($r = 0.60$, $P < 0.001$), personal associations ($r = 0.29$, $P < 0.05$), and emotional content ($r = 0.32$, $P < 0.02$). No differences were found between affect intensity scores for men ($M = 3.57$, $s = 0.40$) and women ($M = 3.81$, $s = 0.31$), and there was no significant relationship found between affect intensity and age.

Gender

To test for differences in the importance men and women ascribed to music components, a series of independent *t* tests were conducted. Significant differences were found for melody (t_{53} = -2.28, $P < 0.05$, $d = 0.6$) and for associations with sport (t_{53} = 2.49, $P < 0.02$, $d = 0.7$). Women rated melody as significantly more important, while men rated associations with sport of higher importance than did women. No other significant differences were found in relation to gender.

Age

The only significant correlation that was found in regards to age was tempo (r = -0.28, $P < 0.05$). Older participants perceived the tempo of music to be less important than younger exercisers.

Discussion

The first aim of this research was to establish participant perceptions of the importance of separate musical components in an activity that does not involve conscious pacing (circuit training). This approach allowed a comparison to be made with the hierarchical conceptual framework of Karageorghis et al. (1999). The results offer good support for the hierarchical nature of the conceptual framework of Karageorghis et al. (1999), even when music was rated in relation to exercise enjoyment and not 'arousing' or motivational qualities. Participants clearly emphasised the primary importance of rhythmic factors, with tempo, beat and rhythm ranked as most important in determining enjoyment. Melody was also rated as highly important to exercise enjoyment, but given the perceived higher importance of rhythmical factors, this offers only limited support to the theoretical position adopted by Lucaccini and Kreit (1972), who suggested that

melody and harmony would be most important in determining affective responses. In contrast, factors concerning associations, which Karageorghis et al. (1999) proposed as least important to determining the motivational qualities of music, were also deemed of low importance in this study.

These results are consistent with past research that has indicted strong rhythmic factors are most salient when selecting motivational music (Atkinson et al., 2004; Karageorghis et al., 2006b; Simpson & Karageorghis, 2006). This is particularly interesting given that in the present research, participants were rating the importance of musical properties in relation to exercise enjoyment and not motivation per se. Karageorghis et al. (2006b) did highlight possible problems with the broad term *motivational music* given the emphasis this definition places on stimulation or arousal, whereas music that enhances mood or affective states might not stimulate physical activity. The present study found no substantive evidence to support these concerns, with those musical properties rated as most important in determining exercise enjoyment, clearly corresponding to the most important components of motivational music (as defined by Karageorghis et al., 1999).

It is perhaps appropriate to highlight the potential importance of both the emotional content of the music and familiarity, with the results of the present study offering support to Bishop et al. (2007). Given that music researchers outside of sport have previously stressed the theoretical importance of such components (Crozier, 1997; North & Hargreaves, 1997; Snyder, 1993), it is necessary for these aspects to be given more consideration in sport and exercise research. Although factors such as familiarity and emotional content are difficult to objectively measure, there does appear to be merit in further evaluating the role of these components, perhaps most appropriately through qualitative approaches. Familiarity appears to be of particular importance in relation to the seminal work of Berlyne (1971), who proposed an inverted ‘u’ relationship between

liking and the arousal potential of music. Berlyne (p. 69) considered variables such as familiarity, as 'most significant' in relation to liking, and predicted over-familiarity would lead to decreased liking, and that ultimately the music would become less arousing. This might explain the results of Priest et al. (2004) who found exercise participants placed great emphasis on variety, perhaps to avoid the decreased arousal associated with over-familiarity. Clearly, more attention is needed to fully understand the role of familiarity and the emotional content of musical selections.

At present, the influence of gender effects in music research in the sport and exercise domain appears unclear. In this study, significant differences were found between the importance that men and women gave to certain musical components. Specifically, in the context of exercise enjoyment, women rated melody of greater importance than did men, while men reported associations to sport as more important than did women. Interestingly, there were no reported differences in relation to the importance that men and women ascribed to rhythmic factors. This finding offers support to Priest et al. (2004), who found no evidence to suggest women had a greater preference for the rhythmical components of music. In accordance with the recommendations of Priest et al. (2004), there is clearly more research needed to understand the influence of gender in music and exercise settings.

In this study, there was a clear trend for older participants to rate musical tempo as less important than their younger counterparts. This appears similar to the work of Priest (2004), who found older participants to prefer slower and quieter music. In relation to musical preferences, Russell (1997) suggests that age effects have not been studied very systematically, but does report trends for younger people to prefer current, popular music. To explore these relationships further, researchers might consider employing longitudinal rather than cross-sectional designs to determine how musical preferences in exercise settings develop over time.

In attempting to extend the previous work of Crust and Clough (2006), who explored the moderating influence of personality in responsiveness to music, the present study focused on the importance that participants placed on components of asynchronous music by evaluating the role of affect intensity. The findings support the hypothesis that participants with higher levels of affect intensity would rate the components of music most likely to contain affective information, as more important. In relation to exercise enjoyment, positive correlations between affect intensity and melody, emotional content, personal associations, style, and lyrical content, certainly emphasise this relationship, and appear to offer support to the theorising of Lucaccini and Kreit (1972). The strongest correlation was evident in relation to lyrical content (r = 0.60) which suggests higher importance for participants with high affect intensity. Thus, while lyrical content was generally rated as being of low importance, for some participants lyrics appear to be far more relevant. These could be very important findings given proposed relationships between enjoyment and exercise adherence (Cervone, et al., 1994). From an applied perspective, if exercise leaders are to inspire greater compliance to exercise programmes that incorporate music, then the present research indicates that the music should be carefully selected to appeal to a wide variety of participants. Although evidence of relationships does not determine causality, it is likely that greater sensitivity to factors other than tempo and rhythm is required, along with further research pertaining to the role of personal factors.

While the present research offers good support to the conceptual framework of Karageorghis et al. (1999), it also highlights some of the important personal factors that are likely to be influential in how an individual defines motivational music. Although there is merit in attaining a general understanding of what constitutes motivational music, especially in regards to meeting the needs of groups of exercisers, much can still be learned from studying the subjective experiences of individuals (Bishop et al., 2007).

Given that interpretations of music are personal and subjective, then it should follow that responses to music are also likely to vary in relation to these interpretations. Research approaches that emphasise personal meaning, such as existential phenomenology (cf. Nesti, 2004) are likely to provide more detailed, rich accounts of the effects of music, which will compliment, and perhaps broaden the scope of music research in sport and exercise. At the very least, such approaches are likely to produce a better understanding of factors that are difficult to measure objectively (e.g., links to imagery, familiarity), and might be used to follow-up on quantitative research findings. The other important reason for examining individual experiences is that although factors such as pitch and tempo in a musical selection are likely to elicit emotional responses in listeners, the actual emotions involved may vary from person to person (Synder, 1993). In an applied sense, this could also allow for more individualised selections to be matched to the needs of the exerciser.

There are a number of limitations to the present study that warrant mention. First, the sample size is relatively small, and reflects the interpretations of one exercise class, and one mode of exercise, so caution is needed in generalising these results. Also, given the exclusive use of fast music in this particular class, it is possible that the associations exercisers have made with such music might have influenced their responses. It is possible that alternative modes of exercise might result in music factors being reported as more or less important. In the present study, while music was not explicitly used to cue the rate and precision of movement in circuit training, there remains the possibility that some participants were using music as a form of pacing. There are clearly dangers (issues of validity and reliability) in adapting pre-existing questionnaires, and using items from inventories interchangeably. However, neither the BMRI or the BMRI-2 appeared to be appropriate (for reasons previously outlined) in this study. The items used in this study were not meant to be considered exhaustive, as

future research is likely to highlight other important components of music, but all items did have theoretical relevance.

Finally, the results of this study offer a starting point in considering the importance of musical properties in relation to exercise enjoyment. Few researchers have looked closely at individual components of music (other than rhythm response elements), to allow a more detailed understanding of the importance of musical properties. Take the example of the tempo (speed) component. Some individuals motivated by the intensity and duration of exercise sessions, may interpret the importance of tempo as meaning fast tempo while others interpret this in relation to matching the pace of more gentle exercise. This is also a criticism of current measurement instruments which assess the motivational qualities of selections but don't consider why individuals rate certain aspects as motivational. The need for more in-depth research is clearly illustrated with Karageorghis et al. (in press) actually finding medium (rather than fast) tempo music to be most preferred during treadmill walking. This same principle can be applied to other components such as the style of music, which are clearly open to individual interpretation (i.e. is style motivational or important in relation to contextual demands of the exercise or due to personal preference?). The application of qualitative methods could help to reveal a more thorough understanding of the most important components of motivational music, and more specifically why exercisers rate certain components of music as more important than others.

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Table I. Perceived importance of components of asynchronous music in determining enjoyment during circuit training exercise (*n*=55).

Music Components	Enjoyment		
	M	*s*	Rank
Tempo	5.93	0.84	1
Beat	5.73	1.30	2
Rhythm	5.64	1.34	3
Melody*	5.11	1.32	4
Familiarity	4.82	1.83	5
Musical Style	4.73	1.38	6
Emotional Content	4.00	1.74	7
Sound of Instruments	3.80	1.53	8
Generation of Images	3.33	1.84	9
Personal Associations	3.25	1.54	10
Lyrical Content	3.13	1.49	11
Association with Sport*	2.78	1.74	12
Artist	2.49	1.48	13

* Denotes significant difference ($P<.05$) between importance rating of men and women.