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Handbook of Music and Emotion

Juslin • Sloboda

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Theory, Research, Applications

Edited by Patrik N. Juslin • John A. Sloboda

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MUSIC AND EMOTION

THEORY, RESEARCH, APPLICATIONS

PATRIK N. JUSLIN
and
JOHN A. SLOBODA

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CHAPTER 25

THE INFLUENCE OF AFFECT ON MUSIC CHOICE

VLADIMIR J. KONEČNI

25.1 INTRODUCTION

INTERACTIONS that one has on a virtually moment-by-moment basis with the social and physical environment frequently produce a change in affect; and so do cognitive representations of the past and expectations of the future interactive events. The complex mechanisms by which the physical and symbolic interactions with the environment give rise to affect, and the evolutionary reasons for this taking place, are for the most part not the subject of this chapter (but see Sections 25.3.2 and 25.5.2). Instead, the key question that it will address is: given that a change in affect has in fact been produced, by whatever means, is the experiencing person more likely to seek exposure to some environmental stimuli than others, and to choose one level or degree of those stimuli more than another? Therefore, when the discussion is additionally and of necessity limited to music as the stimulus, the purpose of the chapter becomes: is the choice of music to which to listen dependent on one's current affect?

In this chapter (and the handbook as a whole), the term 'affect' includes both emotion and mood. However, this classification simply reflects a reasonably justifiable convention and it will therefore be necessary, for theoretical and empirical reasons, that the two states (or processes, see Section 25.3; cf. Scherer, 2000, p. 70) under the 'affect' umbrella be clearly distinguished from each other.

The chapter consists of seven sections. An essential task is carried out first (Section 25.2): to place formally and accurately the topic of the present chapter in the

constellation of relationships—or simple causal models—that constitute a significant portion of the handbook's music-and-emotion (M-E) domain (which, perhaps more accurately, ought to be referred to as the music-and-affect domain). The frequency with which the various categories of 'naïve' respondents endorse the importance and veracity of these causal relationships is also presented in this section, in tabular form.

Section 25.3 also has a foundational and definitional goal—that of specifying the author's theoretical assumptions concerning emotion (and, by implication, non-emotion, including mood). For this purpose, the author's prototypical emotion-episode model (or PEEM; Konečni, 1979, 1984, 1991) is reintroduced in updated form. In part, this section is meant to be a substantive contribution to the emotion literature. More importantly in the present context, the section on PEEM makes explicit the background for the author's interpretation of the research studies on the effects of emotion and mood on music choice (reviewed in Sections 25.4 and 25.6, respectively). Section 25.5 is devoted to a discussion of the concept of mood. Finally, the implications of the research on the effects of affect on music choice are discussed in section 25.7.

25.2 Relationships in the M-E domain

Music consists of many integrated components, including the composer, the score, the performer, the instrument, the sound, the listener, the listening environment—and the M-E domain is correspondingly broad and multi-faceted. In addition, when both researchers and lay people talk about the various relationships between music and emotion, they often fail to specify the extent to which the effect is direct, as opposed to mediated in some way, even though such mediation should often be of major theoretical interest.

25.2.1 Some causal models

Various aspects of M-E are presented in Table 25.1 in the form of simple causal models.[1] The two statements in the bottom part of the table (models 12 and 13) acknowledge the self-evident, but seldom mentioned, facts about M-E. First, much exposure

[1] Characteristics of the instruments, mood/tempo directions in the score, and the structural and acoustic features of the recorded or performed sound, among other features, may all contribute to the expression of emotion by music. These issues are not directly pertinent to the causal models in Table 25.1. Listeners generally can identify the expressive attributes of the music analytically without any concurrent emotional response. Respondents' statements (in Section 25.2.2) to the effect that music expresses, evokes, alludes to, or represents emotion—without any mention of the listener experiencing an emotional state—were classified under model 12.

Table 25.1 Relevant causal models in the relationship between music (M) and emotion (E), and the frequency (%) with which each model is mentioned

Causal Model	Frequency of mention by sample (%)					
	A	B	C	D	E	Mean
1. M → E	25	30	35	23	27	28
2. M → Associations → E	7	13	8	10	12	10
3. M → Dance → E	4	4	8	10	3	6
4. M → Physiological effects (No E)	11	2	0	3	7	5
5. M → Mood change (No E)	4	8	14	13	8	9
6. M → Contemplation, Analysis (No E)	4	2	11	0	2	4
7. $E_{composer} \rightarrow M_{attributes}$	0	4	0	0	6	2
8. $E_{performer} \rightarrow M_{attributes}$	0	6	0	3	2	2
9. $E_{listener} \rightarrow M_{choice}$	29	12	5	17	14	15
10. $E_{1\ listener} \rightarrow M_1 \rightarrow$ Assoc. $\rightarrow E_2 \rightarrow M_2$...	7	4	8	13	2	7
11. $E_{1\ listener\ time\ 1} \rightarrow M_{1\ time\ 1}$ $M_{1\ time\ 2,\ 3...n} \rightarrow$ Assoc. $\rightarrow E_{1\ time\ 2,\ 3...n}$	7	5	8	3	2	5
12. M → No discernible effect	4	9	3	3	10	6
13. E → No discernible effect on M_{choice}	0	0	0	0	5	1

Note: Without being presented with any of the above models, all participants anonymously completed the sentence 'My view of the relationship between music and emotion ...' and could make additional statements; up to three 'views' per participant were coded. In each column, entries are percentages (rounded to the nearest integer) of the total number of responses given by a sample. Sample A (N = 12, with a total of 28 responses; 2002) consisted of three faculty members and nine graduate students at a social psychology seminar. Sample B (N = 44, with 98 responses; 2002) were honours thesis candidates (junior-year undergraduates) at a lecture. Samples C and D (N = 20 and N = 19, with 37 and 30 responses, respectively, in 2004 and 2005): these participants were freshmen at the first meeting of a 'Music and Emotion' seminar. Sample E (N = 71, with 173 responses, 2006) consisted of upper-division students in a class on 'Psychology and the Arts' (prior to the lecture on music and emotion).

to music clearly does not have any discernible effect (model 12). It would seem that the very ubiquity of music in contemporary life ensures that much of it is ignored. For example, in a study using the experience-sampling method (Sloboda & O'Neill, 2001), it was found that although 44 per cent of the events somehow involved music, in only 2 per cent of the total was listening the principal activity. Second, it must be that people often do not choose to listen to music following the onset of an emotion (model 13 in Table 25.1; see Section 25.4).

The rest of the table is divided into two parts, the criterion of division being whether music listening (M) or emotion (E) is the causal agent. (The term 'emotion' is used in the table, rather than 'affect', in order to reflect the prevailing custom in the literature—even though this custom sometimes results in a lack of precision, if not dubious claims.)

M → E models

In the top part, the model stating the *direct* (proximal) causation of emotion by music listening (1, M → E) is presented along with relevant alternatives. Models 4, 5, and 6 formalize the possibility that music may lead to contemplation and analysis, to a change in mood, and even to various physiological effects (e.g. Bartlett, 1996; Bernardi, Porta, & Sleight, 2006)—all without resulting in a genuine emotional state (as specified by PEEM, described in Section 25.3). For example, structural features of music may increase heart rate, but so may riding the bicycle. Music may make one feel 'good', but so does going for a walk. And for some people, especially musicians, music (with or without consulting the score) may be the equivalent of a mathematical or chess problem, and a way to deal with the concept of time (cf. Stravinsky, 1936/1998, pp. 53–54). It is important to note that in the literature on M-E, findings that support models 4 and 5 are sometimes uncritically interpreted as supporting model 1.

Model 3 acknowledges dance as possibly a major—most likely primordial—mediator between music and emotion (Konečni, 2005, 2008; Konečni, Brown, & Wanic, 2008). Dance allows the display of a person's physique, skill, and endurance. The young especially, and young women in particular, engage in it a great deal (Wells, 1990, Table III, p. 108). Dance makes possible the close observation of potential sexual partners and often involves physical proximity with them. It involves being courted, touched, encouraged—or slighted. Miller's (2000) case for the evolution of human music through sexual selection becomes more convincing when dance is proposed as one of the key mediators. It is therefore surprising that dance is almost universally ignored by music psychologists, except as a medium that can reflect the structural and expressive attributes of music (Krumhansl & Schenck, 1997). The chief reason may be music psychologists' relative neglect of the social context of music listening (Konečni, 1979, 1982; North & Hargreaves, 1997).

However, it is the idea that music gives rise to thoughts about significant others, about emotionally rich social situations, and one's past experiences and innermost strivings (model 2), that is here proposed as the central and necessary elaboration of M → E (model 1)—necessary from both the logical and evidentiary points of view. The temporal nature of music, its abstract quality (especially in comparison with other temporal arts, such as the theatre, or even to plotless choreography in dance), its blocking of other distractions when one is truly listening, and the fact that its structural features may affect motor behaviour and physiological responses—all play a part in the transformation of heard sound into emotional state via memories and contemplation (Konečni, 2008; Konečni et al, 2008; Konečni, Wanic, & Brown, 2007).

Krumhansl (2002, p. 45) has challenged a version of model 2 on the grounds that 'if this [that is, associations as the necessary mediators] were all, then emotional responses to music would vary greatly from individual to individual depending on their unique past experiences'. Actually, the available evidence indeed indicates that people's emotional reactions to the same piece of music are vastly different. Krumhansl (2002, p. 45) continues: 'But listeners agree remarkably well with one another in labeling musical emotions. Something in the music must produce this agreement . . . musical sounds may inherently have emotional meaning.' Indeed they may, but that is an issue of

expression, not of induction, and the evidence for the former ought not to be marshalled as evidence for the latter. In other words, listeners' agreement about the expressive features of a piece of music does not favour model 1 over model 2—as Krumhansl apparently maintains.

E → M models

In the middle part of Table 25.1 (models 7–11) are models in which emotion, rather than music listening, is the causal agent. Models 7 and 8 refer to the possibility that the emotions experienced by the composer and performer, while composing and performing, influence the attributes of the composed and performed music. It is exceptionally difficult to investigate these possibilities experimentally (e.g. Gabrielsson & Lindström, 2001; Konečni, 2003; Persson, 2001; Simonton, 2001). Regarding the composers' emotions, when one considers, if nothing else, the length of most classical compositions, one would probably conclude that Gabrielsson and Lindström implicitly agree with at least some features of PEEM (in Section 25.3) when they strongly doubt (as did no less an 'emotivist', in the popular view, than P. I. Chaikovsky) that 'composers express their present feelings in their compositions' and instead think it much more likely that composers merely 'use various structural factors . . . to achieve certain intended expressions' (Gabrielsson & Lindström, 2001, p. 223).

As for the performers, model 8 may be correct for many of them, but in the limited sense of performance anxiety (or, perhaps more accurately, fear—as in 'stage fright') negatively affecting the attributes of performed music (e.g. Steptoe, 2001). The technical demands and concentration required especially in classical performance are so high that it is difficult to see how the performers' emotions can be part of the performance equation (except adversely), despite many music teachers' claims to the contrary. It is also important to note that experiments, such as Juslin's (2000), on performers' 'communication of emotion' do not necessarily address model 8, although they are sometimes cited as having done so: a skilled guitarist can, when instructed, perform a piece in an angry manner, without being in the least angry.[2]

Model 9 is, of course, the core of the chapter and the evidence for its feasibility will be examined in Section 25.4: when emotion is induced in people by non-musical means, which are the characteristics of the music to which they choose to listen (if music listening is indeed the behavioural option taken)? Finally, in models 10 and 11, examples are given of more complex scenarios that begin with $E_{listener} \rightarrow M_{choice}$; it will be argued in Section 25.4.3 that even though no empirical evidence exists for such multi-event sequences interweaving emotion, music choice, listening, and associations, they

[2] Note that PEEM (described in Section 25.3.2) allows the possibility that an 'angry' performance, coupled with associations, may produce genuine anger in the performer. Here one observes the grey area between a performer's faithful facial and bodily imitation of posture and gestures that are commonly assumed by genuinely angry people, on one hand, and a performer's subjective experience of genuine anger, on the other. This fine line is well known to actors and opera singers who encounter it in the 'method of physical action' within Stanislavski's 'system' (Konečni, 1991, 2008; Konijn, 2000; Stanislavski, 1936; Stanislavski & Rumyantsev, 1975).

are common in the lives of music listeners and contribute to the words 'music' and 'emotion' being spoken so often in the same breath.

25.2.2 Frequency of endorsement of causal models

The frequency of mention of various causal models by five different samples of respondents is also provided in Table 25.1; the samples are described in the note to the table. The respondents anonymously completed the sentence 'My view of the relationship between music and emotion . . .' and could make additional statements. Up to three different 'views' regarding M-E by each respondent were coded. Responses were collected at the beginning of a course, lecture, or seminar, without any introduction, guidance, or examples. The coders were two undergraduates who classified the responses in terms of the models in Table 25.1 with minimal additional instructions. The initial agreement between the two coders was 72 per cent, as determined by a third, independent, coder, who also resolved the disagreements.

As can be seen in Table 25.1, at least some respondents mentioned all 13 models used in the classification, with the M → E model by far the most popular (M = 28 per cent for all five samples). From freshmen (many with undeclared majors) to psychology graduate students and faculty, many people held the view that music directly induces emotion. Respondents who felt that music's effect on emotion is mediated by associations and dance (models 2 and 3, respectively) were far less numerous (10 per cent and 6 per cent), but also represented in all the samples.

The second most-mentioned causal relationship—that people's emotions determine their choice of music (model 9; overall M = 15 per cent)—was, perhaps not surprisingly, most frequently mentioned by the professional social psychologists in Sample A (M = 29 per cent). But they were not more likely than others to mention the more complex multi-stage causal models (10 and 11). This may be an indirect testimony to the conceptual and logistical difficulties that social and music psychology face in carrying out multi-stage experiments—even though such research may be sorely needed for the formulation of an adequate body of theory regarding M-E.

25.3 Emotion in the M-E domain

In *Music and emotion* (Juslin & Sloboda, 2001), Scherer and Zentner (2001) published a chapter in which they carefully distinguished emotions from moods, preferences, attitudes, personality traits, and other concepts (Table 16.1, p. 363). The present approach shares their concern for these distinctions. In addition, it is in agreement with Gabrielsson's (2002) emphasis on subjective state as an essential component of an acceptable model of emotion (cf. Frijda, 2005). The latter point is important because—much as there is an emphasis in the present approach on the necessary role of the

physiological response in emotion (an absence of the physiological response is equated with an absence of emotion)—indices of physiological fluctuations are considered to be insufficient when not corroborated by subjective report (i.e. when they are not the report's afferent underpinning; cf. Stemmler, Heldmann, Pauls, & T. Scherer, 2001).

25.3.1 Attributes of emotion

In the present view (cf. Konečni, 1991, 2003, 2008), emotions have an unambiguous cause or object, and because they guide and energize behaviour in key life situations, they have been subjected to considerable evolutionary pressures. Emotions are acute, physiologically and psychologically costly, and therefore reserved for emergencies. Typically there is an involvement of numerous bodily systems—in tandem and simultaneously. These states are readily identifiable by the experiencing person (and often, though not always, by observers), as well as nameable and reportable. Emotions flood consciousness and are probably universal in terms of expression and experience. In general, such criteria fit models of 'natural kinds' (Barrett, 2006) of both the basic-emotions (e.g. Buck, 1999; Ekman, 1973) and appraisal type (e.g. Frijda, 1988; Lazarus, 1991).

The real-world ecology—specifically with regard to the distribution and type of significant stimuli of social origin—limits the variety of emotional reactions (cf. Oatley & Duncan, 1994; Konečni, 2008). In fact, there are good conceptual reasons for reserving the term 'emotions' for the 'basic' ones—keeping in mind the criticisms by Ortony and Turner (1990) and Barrett (2006).

25.3.2 Prototypical emotion-episode model (PEEM)

The prototypical emotion-episode model, PEEM (Konečni, 1984; also see Konečni, 2008, for a more detailed account) is presented in Fig 25.1. This is a process model

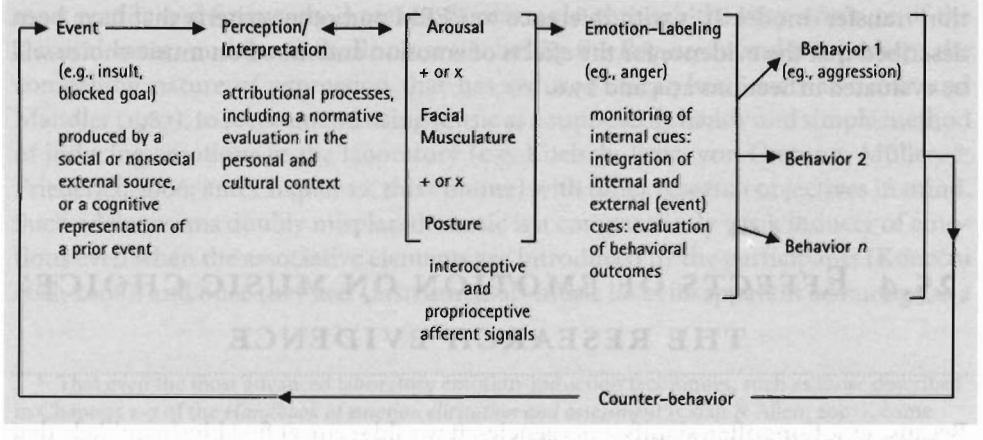

Fig. 25.1 The prototypical emotion-episode model, PEEM. From Konečni (2008), with permission of the American Psychological Association.

of emotion; the aim of its inclusion here is to facilitate the interpretation of various relevant findings. The event that initiates an episode is usually generated by another person (e.g. by an ego-thwarting insult), although it may consist exclusively of rumination related to prior events. Perception and interpretation (including a rapid attributional analysis) are linked by a feedback loop, and this initial stage necessarily precedes the occurrence of sympathetic arousal and facial and postural activity—with which it is, however, bidirectionally causally linked. In addition, arousal and facial expression influence each other (e.g. Ekman, Levenson, & Friesen, 1983; Lanzetta, Cartwright-Smith, & Kleck, 1976) and together (additively or multiplicatively) are subjected to a multi-faceted cognitive analysis that leads to the identification and labelling of one's emotion (the degree of deliberateness may differ).

Behaviour that follows emotion labelling depends on many factors, including the anticipated counter-behaviour by the social target of one's actions. That counter-behaviour is the event that begins the next passage through the emotion-episode sequence. Attributes of this second-generation event may cause the original state to diminish, intensify, or change dramatically—when the event's details require a re-labelling of emotion.

PEEM is conceptually and functionally broader (cf. Scherer, 2000) than models that are limited to a single subsystem (including various arousal models). Its treatment of an emotion episode as a process of multiple passages through a multi-component sequence, as well as the attention it devotes to the occurrence of misattribution and re-attribution, distinguish PEEM from other appraisal models and counter some of the criticisms that Barrett (2006) levels at natural-kinds models in general.

One of the assumptions of PEEM is that both a pronounced visceral response and an unambiguous subjective experience are necessary and probably sufficient for an authentic emotion episode to occur (Konečni, 2008; cf. Stemmler et al, 2001). There is a superficial similarity of this view with that of Schachter and Singer (1962), but also considerable differences in both scope and many significant details (Konečni, 1984). In addition, there is a kinship between certain features of the 'cognitive labelling' model (Konečni, 1975b, later incorporated into PEEM) and Zillmann's (1978) 'excitation transfer' model. It is with reference to PEEM and other criteria that have been described that the evidence for the effects of emotion and mood on music choice will be evaluated in Sections 25.4 and 25.6.

25.4 Effects of emotion on music choice: the research evidence

Because emotions often signify emergencies, it would seem, at first blush, unlikely that listening to music would be the experiencing person's primary option. But emergencies

differ in their time course and in the modes of resolution that are possible, especially in contemporary social milieux, so that resorting to music listening when happy, angry, or sad (although presumably not when afraid) does not, on second thought, seem far-fetched. Unfortunately, this is mostly speculative reasoning, because, to the best of the author's knowledge, there exist no truly solid data collected in non-laboratory settings about the likelihood of persons choosing to listen to music (or read poetry, for that matter) immediately after an emotional state has been authentically induced. The diary, pager, interview, and survey studies provide some useful information, but have virtually insurmountable problems in trying to attain truthfulness, accuracy, and conceptual clarity (e.g. regarding the occurrence of emotion vs. mood), and to establish the direction of causality. Under normal circumstances, even though emotions are social, in that they often involve other human beings, they and their settings are private and intimate affairs to which researchers have very limited access.

25.4.1 Some methodological problems in the laboratory

Tightly controlled research in the laboratory has another set of problems. Perhaps the greatest and most relevant among these is that happiness and sadness (unlike anger and fear) cannot be *adequately* experimentally created. In the real world, these two key emotions of human bonding, separation, and loss, with immense reproductive-fitness implications, are generally induced by the rare significant others—something that cannot be replicated in the laboratory.[3] Perhaps the closest one can come to happiness and sadness in the laboratory is to ask people to recall real-life events (e.g. Konečni et al, 2008). Minor monetary winnings and losses, 'happy' or 'sad' three-minute film clips, praise from strangers, or the break-up of five-minute acquaintanceships—to mention just a few of the countless rather trivial events that have been engineered in the laboratory—do not result in emotions, or do so only as misnomers in scientific articles.

It is of interest that happiness and sadness are precisely the two emotions that music most readily and frequently *expresses*, for example, through the very structure of the classical sonata and the Catholic mass (including the *Requiem*); and it is perhaps the compelling nature of expression that has seduced researchers, such as Gaver and Mandler (1987), to recommend using music as a supposedly handy and simple method of inducing emotions in the laboratory (e.g. Koelsch, Fritz, von Cramon, Müller, & Friederici, 2006; and Chapter 12, this volume) with other research objectives in mind. Such advice seems doubly misplaced: music is a comparatively weak inducer of emotions even when the associative elements are introduced by the participants (Konečni et al, 2008); and once they are, (instrumental) music loses its apparent advantage as a

[3] That even the most advanced laboratory emotion-induction techniques, such as those described in Chapters 1–7 of the *Handbook of emotion elicitation and assessment* (Coan & Allen, 2007), come nowhere near the happiness- and sadness-inducing power of one's significant others can be easily ascertained by the discerning reader.

convenient 'appraisal-free' stimulus. In any case, as has been made clear, the focus of the present chapter is exclusively on the effects of non-musically induced emotions.

Authentic anger and fear can be induced very successfully in the laboratory. However, even though the procedures were safe, reliable, and humane, the truly adequate induction of these emotions in social-psychological and psychophysiological laboratories has been made, beginning with the early 1980s, next to impossible by the institutional boards overseeing research in both North America and Europe. For this reason, the review that follows is of data from laboratory studies conducted prior to what has been, in effect, an international ban on research on adequately induced negative emotions.

25.4.2 Data

A certain amount of solid evidence is available regarding the effect of listeners' emotional states on their choice among, and preference for, music-listening alternatives that differ on psychologically and aesthetically important dimensions, such as complexity, loudness, and rhythmic characteristics. The general finding is that the experience of negative emotional states leads people to sharply decrease their exposure to complex, novel, and loud music, and to complex rhythmic structures. The probable, mutually non-exclusive, and related explanations are that (a) coping with an acute, experientially demanding negative state decreases the amount of processing capacity that is available for the processing of music (Konečni & Sargent-Pollock, 1976) and other stimuli (Broadbent, 1971; Easterbrook, 1959; Kahneman, 1973; Posner, 1975; Sokolov, 1963), and (b) simple music at a soft listening level actively soothes negative emotions (Konečni, 1975b).

Anger

In a multi-purpose experiment, Konečni, Crozier, and Doob (1976) used an anger-induction procedure (originally developed by Konečni and Doob, 1972) to investigate the effect of this aversive emotional state on the choice between two computer-generated 'melodies' differing in complexity (or, in information theory terms, uncertainty). The effect of this powerful—naturalistic, yet standardized—anger-instilling procedure (with ego-thwarting remarks delivered by a covert assistant of the experimenter) is a considerable degree of authentic anger experienced by the (individually treated) research participants. In comparison to the neutrally treated control participants, those subjected to the experimental emotion manipulation exhibited anger in terms of self-report, facial configuration, and body posture (videotaped and later evaluated by raters unaware of the instigating condition), as well as cardiovascular response (cf. PEEM in Fig 25.1). The original research reports can be consulted for the evidence of extensive debriefing of participants and the efforts made to ensure their well-being during and after the experiment.

In the immediately following stage of the experiment, which was described to participants as an unrelated study, they chose on each of 50 ten-second trials to listen either

to highly complex (9.17 bits/tone) or rather simple (4.00 bits/tone) tone sequences. Complexity was manipulated by varying the number of pitches, durations, and loudness levels of tones (keeping timbre constant), with 576 possible events in the pool for the complex, and only 16 in the pool for the simple, tone sequences that were randomly computer-selected within type (using sampling with replacement). These two complexity levels were used on the basis of pilot studies in which neutrally treated participants chose the two levels equally often over trials; this could be shown to be due to the different degrees of rated pleasingness and interestingness of the two 'melody pools' being perfectly balanced.

In the present context, the most relevant finding by Konečni et al (1976) was that the angry participants chose complex melodies on only 29 per cent of the trials, compared to about 50 per cent for the control group. The overall data pattern was in accord with Konečni's (1975a, 1975b) cognitive-labelling model, and showed that the active ingredients of the emotion that led participants to shun complex melodies were both the heightened physiological arousal and the cognitive processes (made explicit in PEEM) that were responsible for the interpretation and labelling of the heightened arousal level. A closely related issue is that coping with anger was presumably both physiologically and cognitively costly for the participants, and therefore reduced, as noted earlier, their processing capacity available for the reception and enjoyment of music. With regard to the impact on music choice, the difficulty of dealing with one's negative emotion seems to exceed that of coping with ordinary high-load tasks (see Figure 1 in Konečni, 1994; Konečni, 1975a; Niketta, 1990).

Complexity, a member of Berlyne's (1960, 1971) class of 'collative', or statistical, stimulus variables (along with novelty and surprisingness), is one of the relatively few major psychological and aesthetic dimensions by which both lay people and experts—spontaneously and analytically—describe musical compositions (and other works of art); it is therefore conceptually advantageous to relate a genuine emotion arising in dyadic social interaction to this attribute of music. (See Chapter 19, this volume, for a discussion of Berlyne's theory.) The results obtained by Konečni et al (1976) were perhaps the first in the literature to relate an emotional state induced by social stimuli (insulting words) to the choice of music to which to listen; the latter had been generally treated as if it occurs in a socio-emotional vacuum (cf. Konečni, 1979, 1982; North & Hargreaves, 1997).

Flath-Becker and Konečni (1984) were interested in the effects of the participants' anger and failure (including combined stress) on their preference for music pieces that differed radically in rhythmic complexity. The researchers' anger manipulation was modelled after a procedure developed by Hokanson and Shetler (1961). The participants were either repeatedly and sternly reprimanded to work faster on a task or neutrally treated. In addition, they either appeared to fail or to succeed on the task. In a counterbalanced research design, the participants then listened to portions of piano (Bach, Debussy, Bartók, Schönberg), orchestral (Bach, Ravel, Bartók, Schönberg), and percussion (Ginger Baker, Siegfried Fink-a, Fink-b, Cage) compositions characterized by different rhythmic structures (regular, ostinato, syncopated, and complex, respectively). As predicted, the more complex rhythmic

structures were shunned in the anger and, especially, the anger combined with failure, conditions. The preference for simple over complex rhythms in the combined stress condition was more pronounced in the piano and orchestral than in the percussion compositions (Flath-Becker, 1987). The additive effect of failure on angry people's already low preference for complex rhythm could be accounted for by an early version of PEEM (Fig 25.1).

In sum, Flath-Becker and Konečni (1984) were able to replicate and extend prior findings. Significantly, they obtained the predicted effects with composed, as opposed to computer-generated, music. That the effect of shunning complexity while experiencing a negative emotional state was stronger for the piano and orchestral than for the percussion compositions is open to several interpretations. One is the relative rejection of contemporary percussion compositions by the non-musician participants, and their consequent lack of attention to the music's detailed attributes. Another is the degree of presence of the attention-maintaining melody in various compositions, which was confounded with their novelty. In any case, the extent to which emotions may *differentially* influence the processing of various attributes of music that contribute to the overall preference is a worthy subject for a renewed research effort.

Results theoretically analogous to, or supportive of, those for complexity have been obtained for loudness (one of Berlyne's, 1971, psychophysical stimulus dimensions), as both an independent and dependent variable, in studies by Konečni (1975b), and Konečni and Sargent-Pollock (1976, 1977; cf. North & Hargreaves, 1999). For example, Konečni and Sargent-Pollock (1976) showed that the significant reduction in the participants' choice of complex computer-generated melodies, following exposure to 95-dB/350-Hz squarewave stimulation, was mediated by a decrease in their processing capacity—lending support to one aspect of the previously mentioned interpretation of the overall $E_{listener} \rightarrow M_{choice}$ effect (Konečni, 1979, 1982, 1994).

Type A behaviour pattern

The manner in which anger influences a person's processing of music can be further clarified by considering the Type A coronary-prone behaviour pattern. In contrast to Type B, Type A behaviour is characterized by three main tendencies: time urgency, extreme competitiveness, and aggressiveness (Friedman & Rosenman, 1974; Jenkins, Rosenman, & Zyzanski, 1974). These tendencies result in Type A individuals being comparatively likely to focus on the central aspect of a task to the exclusion of peripheral stimuli or information (Matthews & Brunson, 1979), even when the peripherally presented information can be helpful in the work on the central task (Strube, Turner, Patrick, & Perillo, 1983).

The Type A behaviour pattern therefore has precisely the same consequence on information processing as does the presence of a negative emotional state for people in general (cf. Easterbrook, 1959). Building on these ideas, Konečni and Gotlieb (1987) reasoned that (a) the differences in attention and processing between Type A and Type B individuals could be further augmented by the participants being sternly challenged (on an initial pseudo-task) and (b) one could gain additional knowledge about the

effect of negative emotion on the processing of music by presenting to both types of participants, for the subsequent criterion tasks, a musical composition that authentically contains central and peripheral elements.

A fugue is such a musical form. The material for the experiment by Konečni and Gotlieb (1987) therefore consisted of three fugues (specially composed for the research, so that no participant would be familiar with them) and four variations on a segment of each fugue. A melodic phrase served as the central feature of each stimulus pattern, whereas the variations served as peripheral embellishments. There were two dependent measures: recall of the pitch contour of the central phrase (notes written on a music staff) and recognition of which of the four embellishments actually accompanied the central phrase. The results closely matched the predictions. Compared to other groups, the sternly challenged Type A individuals excelled on the recall test that dealt with the central features of each fugue and did poorly on the recognition test involving peripheral embellishments.

By having an intense, but excessively narrow, focus of attention, the angry Type A individuals simplified the array of musical stimuli to which they were listening. There is a clear conceptual link between this finding and those discussed in the previous section. Angry people in general, when given the choice between music pieces differing in complexity, prefer the simpler (computer-generated or authentic-music) options.

Consequences of angry people's exposure to music

It is helpful to shed more light on the preference that angry people have for simple melodies. Additional information comes from experiments on the *consequences* of angry people's (experimenter-imposed) exposure to simple melodies at a comfortable listening level, namely: (a) a reduction in the reported degree of anger; (b) a decline from an aversively high level of sympathetic arousal; and (c) a decrease in the probability and amount of aggressive behaviour (Konečni, 1975a, 1975b, 1979). Such findings make sense when one remembers that anger and a high level of arousal—the results of an unpleasant social exchange and characterized, for example, by a rise in systolic blood pressure of some 25 mm Hg over the baseline in the procedure used by Konečni and Doob (1972; cf. Hokanson & Shetler, 1961)—are reported by the participants as highly aversive. Meanwhile, simple melodies at a comfortable listening level are soothing and act faster than homeostatic processes. They are more effective than silence or reading or math tasks or complex melodies (Konečni, 1975a, 1975b; Strube et al, 1983) in ameliorating the aversive psychological consequences of anger, high arousal, and implied aggression.

Partly in this vein, Caspy, Peleg, Schlam, and Goldberg (1988) found that listening to 'sedative', as opposed to 'stimulative', composed music following a frustrating maze task helped the participants do better on Raven's matrices (cf. Rickard, Toukhsati, & Field, 2005, p. 236). Analogous results following mental arithmetic were obtained by Chafin, Roy, Gerin, and Christenfeld (2004)—a faster cardiovascular recovery due to music such as Pachelbel's *Canon* in comparison to less soothing music.

Fear

There are few real-world emergencies more compelling than those that succeed in inducing fear—and music listening is unlikely to be an adaptive response to them. Nevertheless, in what is perhaps the only laboratory experiment on this topic in the literature, Konečni (1979, section III.C., pp. 183–190) examined whether fear resulted in preference for simple melodies analogous to what has been observed for anger.

In the first stage of the experiment, participants assigned to the fear manipulation were told that at any time 'over a four-minute period they may be exposed to some extremely loud and aversive blasts of noise' (Konečni, 1979, p. 185; no noise was in fact administered to anyone in the experiment). During this four-minute period, some of the scared participants listened, on a pretext, for several minutes continuously to computer-generated simple melodies (4.00 bits/tone), whereas others spent the four minutes without anything at all happening. There were additional control groups of people who were not made afraid and of those who were neither afraid nor heard the music. After this initial stage, 15 minutes of rest filled with neutral activities followed for all groups. In the next stage, some participants underwent a similar fear manipulation for the second time, whereas for others fear was instilled at this point for the first time; and there were two no-fear control groups, one of which had heard the melodies in the initial stage, whereas the other had not. In conjunction with this stage, the dependent measure was collected: on each of 25 occasions signalled by a light, the participants could, if they wished, press a button—following which they would hear, for as long as they kept the button pressed (up to six seconds on each occasion), a simple computer-generated melody.

Turning to the results and examining first the music-exposure choices of the two no-fear groups as the baseline, one finds that the participants with prior experience of the melodies listened to them significantly longer when they were later given the choice than those without prior experience (means of 47.40 s vs. 34.40 s). A result in the same direction, but weaker (44.60 s vs. 39.30 s), was obtained for the two groups in which fear was experienced only once, in the final part of the study, with only the former group having prior experience with the music. So far, one can conclude that the simple melodies 'grow on one', to some extent, but that the people experiencing fear do not seek them more than those who are unafraid. However, the participants who chose to listen to the melodies more often, and for a longer total duration, than any other experimental group were those whose first (of two) fear experiences was accompanied by the melodies ($M = 73.10$ s of 150 s possible; whereas $M = 45.80$ s for the twice-afraid group without prior music experience).

On the basis of these results, it would seem that scared people's attraction to simple melodies is not as 'natural' as angry persons'. Judging from the choice behaviour of the two twice-afraid groups, with and without prior listening experience, people apparently need to learn that when one is afraid, simple melodies are psychologically soothing. However, once this knowledge has been acquired, scared people sought the melodies a great deal. Laboratory learning is not necessary for anger; perhaps the real-world ecology and dynamics of anger and fear differ in the extent to which people have the opportunity to learn about the soothing properties of certain kinds of music.

25.4.3 Implications of the $E_{listener} \rightarrow M_{choice}$ model

Although one would have preferred the evidence to come from a greater number of laboratories, it nevertheless seems convincing: The $E_{listener} \rightarrow M_{choice}$ model (9 in Table 25.1) is viable with regard to emotion as defined in PEEM (Fig 25.1), and in terms of choice among music-listening alternatives differing in complexity and some other collative and psychophysical variables. There is little doubt that people experiencing negative emotional states seek simple melodies. The evidence that such melodies are soothing ought to be appealing to researchers interested in the plausibility of the $M \rightarrow E$ model (1 in Table 25.1)—even if it should turn out that music has a stronger direct (proximal) impact on emotions by diminishing negative ones than by inducing positive (*or* negative) ones.

It should be noted that some of the mentioned findings hold for other art forms. For example, with regard to novelty, Konečni and Sargent-Pollock (1977) found that anger and aversively high physiological arousal lead people to shun little-known twentieth century paintings, and obtained additional support for the mediating role of limited processing capacity in the perception and enjoyment of aesthetic stimuli from different modalities (cf. Konečni's aesthetic-episode model, 1994). In fact, analogous findings have been obtained outside the domain of music and other arts. For example, Marlatt, Kosturn, and Lang (1975), using the identical anger-induction laboratory procedure that had been developed by Konečni and Doob (1972; and also used in the Konečni et al 1976 study described earlier), found that angered social drinkers consumed significantly more wine in the laboratory than those who had not been insulted. Alcohol intake and listening to simple melodies can apparently serve the same purpose—amelioration of negative emotion.

Findings that relate music choice by people experiencing certain emotional states to analogous preferences in other art forms and, especially, to non-aesthetic behaviours, hint at the desirability of studying music choice in the stream of daily activity (Konečni, 1979, 1982; North & Hargreaves, 1997). One research direction that implicates the $E_{listener} \rightarrow M_{choice}$ relationship as only the initial stage of complex, but more realistic, scenarios would utilize models 10 and 11 in Table 25.1. In model 10, a person experiencing a particular emotion chooses to listen to a suitable piece of music that gives rise to memories and associations (Juslin & Laukka, 2004, p. 225; Konečni et al, 2008) and these, in turn, lead the listener to replace the initial emotion by a different one; as a consequence, the person then chooses a different piece of music. In terms of PEEM (Fig 25.1), choosing to listen to soothing music when angry makes that event the initial stage of the next passage through the emotion-episode loop—one that is likely to result in a reduction of anger (Konečni, 1975a, 1979, 1982; Konečni et al, 1976) and the selection of different—presumably more complex or strident—music.

In contrast, model 11 formalizes the possibility that an emotion that led a person to choose a given piece of music can be reinstated, with the help of associations, when that same piece of music is heard (by choice or inadvertently) on subsequent occasions. In terms of PEEM, model 11 states that a piece of music, together with the associations to which it gives rise, may serve as the initial event in an emotion episode (cf. model 2 in Table 25.1). Note that the first part of model 11 makes explicit one of the possible sources

of associations postulated in model 2. Despite its plausibility, testability and theoretical importance, only considerable literary and anecdotal material supports model 11 at this time.

25.5 Mood in the M-E domain

Mood is emotion's unglamorous and unclamoring cousin—despite claims that 'mood is now recognized as a central element of human behavior' (Thayer, Newman, & McClain, 1994, p. 910). The latter statement presumably reflects ubiquity rather than impact, for there certainly seems to be a great deal of mood in the world—far more than emotion—and most of it is easily ignored or forgettable. Mood's omnipresence is associated with a great ease of occurrence and instilment in both the real world and the laboratory. There is therefore a myriad of simple laboratory procedures involving mood, many of which—music listening included—can be employed with a minimum of pre-testing and experimenter training. It follows that there is a large literature dealing with mood.

Since a mood does not 'press' like an emotion does, one may or may not be aware of it (authors—Thayer et al, 1994; Zillmann, 2000—differ on the necessity of awareness); but a mood's experiential component is clearly accessible to attention and analysis. Yet moods are so diffuse and subtly diversified that the term seems to have been expanded to cover most of what one can be consciously aware concerning one's inner state.

In the words of Parkinson, Totterdell, Briner, and Reynolds (1996, p. 5), 'mood may be something that is always with us but continually fluctuates over time'. In contemporary society, worldwide, 'mood' can be replaced by 'music' in the quoted sentence. One can see how the attributes of constant presence, diffuseness, subtlety, and diversity would make mood a natural partner for music—in everyday parlance, in social ecology, in lay theories, and in psychological research.

25.5.1 Some criteria for mood

Mood has been carefully distinguished from emotion by numerous authors including Ekman (1994, p. 56), Parkinson et al (1996, pp. 4–8, including Table 1.1, p. 8), Oatley, Keltner, and Jenkins (2006, p. 30), Larsen (2000, pp. 129–30), and Scherer and Zentner (2001, p. 363). Using these terms interchangeably—inadvertently or intentionally—is nevertheless rampant. Only rarely do authors who have engaged in the practice (Tice & Bratslavsky, 2000, p. 149) graciously issue a *mea culpa* (Tice & Wallace, 2000, p. 214).

There is agreement with regard to the dimensions on which moods and emotions can be distinguished. According to Parkinson et al (1996, pp. 4–8), these include (the mood pole in parentheses): duration (long), time pattern (gradual onset, continuous),

intensity (low), and the specificity of cause (no particular event), and object (unspecified). No wonder William James wasn't interested.

A key distinction—the extent of the physiological response—can be classified under the intensity dimension. As just one example, when participants' moods were instilled by film clips in the study by Cantor and Zillmann (1973, p. 101), the maximum systolic blood-pressure increase was 4.5 mm Hg; in contrast, the anger-induction procedure used by Konečni and Doob (1972) resulted in five times greater increases in pre-testing.

The difference between mood and emotion is perhaps the most striking when one considers the kind and number of laboratory procedures by which moods have been induced. One of them is Velten's (1968): participants read statements and are asked to experience the corresponding mood. Improbably, this technique is effective (cf. Parkinson et al, 1996, p. 51). In fact, in one study (Slyker & McNally, 1991), a simple instruction to 'get into a mood' (p. 37) was as effective as instruction + Velten, instruction + music (Schönberg, Prokofiev),.and instruction + Velten + music in inducing 'anxious' and 'depressed' moods.

25.5.2 Mood regulation

The central theme of mood research is the regulation of one's mood (e.g. Isen, 1984; Larsen, 2000; Zillmann, 1988, 2000), with most of the work devoted to the amelioration of bad mood. Thayer et al (1994) identified 32 categories of methods of repairing a bad mood; in the six-factor solution, music found its place alongside 'engage in hobby' and 'humour' in Factor 2, 'seeking pleasurable activities and distraction' (Table 2, p. 916). Parkinson et al (1996) similarly mentioned over a hundred strategies of mood maintenance and repair, among which was music.

With regard to theory, the initial work in mood regulation was limited to an exceptionally simple version of hedonism, sharing it with pop psychology and the self-help industry.[4] Parrott's (1993) discussion of motives to inhibit good moods (cf. Knobloch, 2003), and the demonstration, by Erber, Wegner, and Therriault (1996), that people may adjust their moods downwards or upwards for the purpose of optimal self-presentation, have not been a serious threat. The 'hedonists' (e.g. Larsen, 2000; Oliver, 2003; Zillmann, 2000) somewhat belatedly invoked 'delay of gratification' and claimed that mood could be an instrument, rather than the end result: people prefer good total outcomes to good moods (cf. Martin & Davies, 1998). For example, purposefully maintaining a bad mood might help one offer condolences with more decorum. A pinch of hypocrisy is thus added to simple hedonism.

[4] Although the terms 'mood regulation' and 'emotion regulation' are often used interchangeably, there have been serious attempts, such as that by Gross (1998, p. 276), to distinguish between the two; moreover, Gross's (1998, Figure 4, p. 282) 'process model of emotion regulation' has some useful points of contact with PEEM (Figure 25.1 and Konečni, 1979, 1984, 2008). Another article on emotion regulation that is relevant for mood-regulation issues is that by Cole, Martin, and Dennis (2004)—especially in terms of these authors' cogent conceptual criticisms and sound methodological advice.

25.6 Effects of mood on music choice: the research evidence

25.6.1 Inclusion criteria

The literature on music preference is numerically dominated by studies (almost exclusively on adolescents or students) that report correlations between personality tests (e.g. extraversion, the five-factor model, sensation seeking; see Chapter 24, this volume) and music preference or music taste (reported retrospectively by paper and pencil). In many other studies, the correlations are between music preference (usually overall, but sometimes for a genre, or a theme, such as 'lost love', or an attribute, such as tempo or dynamics) and some verbal measure, retrospectively given, of an issue of interest to adolescents—drug use, loneliness, attitudes toward women and violence, being alone in their bedroom, suicide risk, 'romantic deprivation', recklessness. There have also been studies, starting in the 1950s and still going strong, that report correlations between music preference and popularity among peers, and generally discuss the role of music preference in young people's self-identity, clique membership, perception of others, and communication strategy. In many studies, music preference is related to some aspect of marketing or to shopping preferences (see Chapter 32, this volume). Since current mood plays no role in all these groups of music-preference studies—or at most a peripheral, causally remote, poorly measured one—they will not be discussed further.

Pager-style ('experience-sampling') studies dealing with mood and music listening are also outside the scope of the present chapter (see Chapter 18, this volume). Such studies are preferable to most mood-and-music paper-and-pencil work because they often yield useful information about the social ecology of music listening, but they cannot provide any information on the causal flow among the variables. Mood is obviously not experimentally manipulated. And it is pointless to discuss distinctions in the effects of mood, emotion, or attitude on the basis of such studies, because participants use their respective implicit 'theories' of what these terms mean. In only one study (Thompson & Larson, 1995, p. 735) was the focus exclusively on music listening as the primary activity.

A study by Saarikallio and Erkkilä (2007) attempted to develop a 'grounded theory' of mood regulation by music—relying exclusively on data collected in two 1.5-hour group interviews with eight adolescents (with follow-up forms). Such an approach shares many of the structural problems of the pager studies and has additional weaknesses. On balance, the richness of the collected anecdotal material seems more than offset by the drawbacks of the approach.

25.6.2 Data

In an important laboratory study that examined music preference as a function of induced moods, Cantor and Zillmann (1973) showed, in a 2 X 2 between-subjects

design, pleasant vs. unpleasant X exciting vs. not exciting film clips to participants who then rated three songs (that were equally liked in pre-testing) in succession. In line with predictions that took the passage of time into account, hedonic contrast was obtained for the first song, excitation transfer for the second, and no effect of mood on preference for the third. The study showed how malleable, by mood, the liking for a short piece of music can be: preference apparently reflects the different rates of decay of components of mood. Note that the hedonic-contrast finding for the first song matches, for unpleasant mood, the result obtained by Konečni et al (1976) for negative emotion.

It is essential to distinguish between stable long-term preference for a genre and music attributes such as 'intense and rebellious' (Rentfrow & Gosling, 2003), on one hand, and people's choice among music alternatives in the presence of a mood, on the other. In what was perhaps the first laboratory experiment on what they called 'mood optimization', Breckler, Allen, and Konečni (1985) used a forced-choice paradigm in which participants listened to two minutes each of baroque music (mean ratings in pilot studies: complex, soothing), twentieth-century avant-garde music (complex, non-soothing), soft rock (simple, soothing), hard rock (simple, non-soothing), and a 350-Hz squarewave stimulus at 95 dB-A (rated aversive), for a ten-minutes total exposure. Participants made a choice every 15 s, were in complete control of the sequencing and chunking, and kept a tally of their choices; their individual pre-experiment liking for the four genres was known. Of main interest was the participants' strategy of self-exposure to the five alternatives, especially how they dealt with and offset the aversive stimulation.

The majority of participants chose the same mood-optimizing strategy: they listened to all of the aversive stimulation early in the session ('spinach first'), but did so in short runs interspersed with short runs of their 2nd, 3rd, and 4th most-liked music. It was, however, the 2nd most-liked soothing music that most frequently followed the aversive stimulus *immediately*. Sessions were typically ended by long runs of the best-liked music ('ice cream'), which for most participants was soft rock.[5]

In this impressively complex and fine-tuned strategy (which strongly implies non-automaticity of mood optimization), participants kept their most preferred music for the final listening pleasure, away from aversion, even though for most of them that final music was soothing *and* simple; they sacrificed the somewhat less-liked soothing *or* simple music to offset the negative impact directly. With familiar music—common in everyday life but absent in the Cantor and Zillmann (1973) study—there is clearly a constraint on the malleability of music preference by transient moods.

Experiments by North and Hargreaves (2000) supply another example of people's fine-tuned strategy of music choice. By varying tempo and loudness, two choice alternatives were created from the same music piece. *While* participants rode an exercise

[5] Analogous results were reported by Breckler et al (1985, Experiment 2) for visual stimuli. In a somewhat similar vein, Forgas and Ciarrochi (2002) found that people alternated their exposure between mood-congruent and mood-incongruent stimuli in order to maintain mood within reasonable limits.

bicycle or relaxed, they matched the 'energy' of the activity that was requested of them and chose predominantly 'high-arousal' music in the exercise group and 'low-arousal' in the relaxation condition. However, when (different) participants made selections immediately *after* exercise or relaxation, mood optimization replaced energy matching, so that people who had exercised chose 'low-arousal' music 71 per cent of the time (see also Chapter 19, this volume).

Analogous results were obtained by Lai (2004) with forced music exposure. Participants (elderly Taiwanese), who were apparently anxious prior to the period of relaxation that was coupled with listening to music, rated the music that was associated with the onset of recovery as the best. In addition, Dibben (2004), having exposed participants to four 40-second Haydn and Mozart excerpts, found that they gave higher ratings to their ensuing state if they had exercised prior to the music than relaxed; her results supported the cognitive labelling and excitation transfer models in the domain of mood.

Perhaps the most straightforward finding was obtained by Knobloch and Zillmann (2002). They placed participants in a bad, neutral, or good mood by false performance feedback, and then let them choose to what to listen over the next ten minutes; the options—which could be sampled ad libitum—were high vs. low 'energetic + joyful' (EJ) Top 30 songs. Mean exposure to high EJ music by people in bad, neutral, and good mood, respectively, was: 5.25, 4.82, and 3.78 minutes.

People in a bad mood, all else equal, will try to improve it (cf. Larsen, 2000)—including by music with commonsensical 'up' attributes of tempo and lyrics. People in a good mood can presumably afford to experiment—including with 'sad' music.

25.6.3 Mood and music: concluding remarks

There are constraints and subtleties in how mood influences music choice, but such findings should not obscure what is undoubtedly a central fact: good-mood maintenance is less important than bad-mood repair (cf. Tice & Wallace, 2000, p. 215). Whether one should therefore speak of a 'science of mood regulation' (Larsen, 2000, p. 129) is debatable. Knobloch and Mundorf (2003, p. 504) see it this way: 'A cynical speculation of future developments is the vision of a next generation of interfaces that will probably decode the user's mood and the corresponding music need from information such as heart rate, body heat, and pupil width.'

Measurable perturbation of the mentioned indices is not characteristic of mood—but there is no doubt that moods can be regulated, managed, adjusted, and optimized by music exposure and choice. Strategies may vary in complexity and the degree to which they are deliberate, habit-driven, or unconscious.

The deliberate choice of 'sad' music by listeners in neutral or sad moods has here been referred to only indirectly, in part because scarcely any solid data exist. It is ultimately an issue for (psychological) aesthetics that should include other art and entertainment forms, and more elaborate mood-optimization models (cf. Knobloch-Westerwick, 2006).

25.7 Affect and music choice: implications

A chapter this author wrote 25 years ago (Konečni, 1982) emphasized the importance of studying emotional and cognitive factors in the social ecology of 'listening to music [given that listening] has become fully imbedded in the stream of daily life' (p. 500). The critique contained a call for music psychology to investigate ordinary people's interactions with music in the real world (pp. 497–502). It is gratifying to see that the recent experience-sampling studies, despite their shortcomings, have been successfully grappling with the social ecology of music, and that Chapter 18 in this volume is entitled 'Music in everyday life'.

However, in the domain of the present chapter, a recent consequence of going 'into the world' has been a paucity of ambitious laboratory studies. Large-scale studies are needed of the effects of socially induced affect on self-directed exposure to authentic music—categorized, on theoretical grounds, by structural and genre attributes. Also sorely lacking are carefully controlled experimental investigations of the *comparative* and *combined* effects of emotions and moods on the choice of music. As just one example, it is of great interest to study the combined effects of socially induced emotion and non-socially and semi-socially induced mood (by caffeine, alcohol, different types of exercise, news, Internet use, humour, music with and without lyrics). Because mood-driven exposure to music is a frequent (natural?) accompaniment to consumption, information, and physical and entertainment activities, studying their combined effects should be a profitable research endeavour.

Ekman (1994, pp. 56–7), Parkinson et al (1996, p. 9), Larsen (2000, p. 130), and Siemer (2005, p. 817) have discussed the connections between emotions and moods. Theoretically, of particular interest are similarly named states and situations in which, for example, a 'down' mood may be experimentally shown to lower the threshold for the full-blown emotion of sadness to develop when additional stimuli are presented.[6] However, when the down mood and sadness are separated by days, is amelioration more urgently sought in the case of emotion than mood? Is the 'arousal' aspect of a musical stimulus relatively more important for the optimization of mood and positive emotion, and its 'valence' more important in negative emotional experience? In addition to its intrinsic interest, people's choice among carefully constructed music alternatives may be the ideal vehicle by which to tease apart the subtle similarities and differences among affective processes.

[6] The idea that a mood may lower the threshold for the occurrence of a same-named emotion (cf. Konečni, 1975a, 1975b) should be distinguished from Ekman's view that 'it is as if the person is seeking an opportunity to indulge the emotion relevant to the mood' (1994, p. 57). The latter seems to go too far toward treating moods as causes of an active search for emotion-arousing stimuli. Note that in a study that appears to bear directly on these issues (Siemer, 2001), research participants who had been placed in qualitatively different moods later, unfortunately, only judged brief hypothetical 'emotional scenarios', rather than experienced any actual emotion.

Recommended further reading

1. North, A. C., & Hargreaves, D. J. (2008). *The social and applied psychology of music.* Oxford: Oxford University Press.
2. Konečni, V. J. (2008). Does music induce emotion? A theoretical and methodological analysis. *Psychology of Aesthetics, Creativity, and the Arts, 2,* 115–29.

References

Barrett, L. F. (2006). Are emotions natural kinds? *Perspectives on Psychological Science, 1,* 28–58.

Bartlett, D. L. (1996). Physiological responses to music and sound stimuli. In D. A. Hodges (ed.), *Handbook of music psychology* (2nd edn, pp. 343–85). San Antonio, TX: IMR Press.

Berlyne, D. E. (1960). *Conflict, arousal, and curiosity.* New York: McGraw-Hill.

Berlyne, D. E. (1971). *Aesthetics and psychobiology.* New York: Appleton-Century-Crofts.

Bernardi, L., Porta, C., & Sleight, P. (2006). Cardiovascular, cerebrovascular, and respiratory changes induced by different types of music in musicians and non-musicians: the importance of silence. *Heart, 92,* 445–52.

Breckler, S. J., Allen, R. B., & Konečni, V. J. (1985). Mood-optimizing strategies in aesthetic-choice behavior. *Music Perception, 2,* 459–70.

Broadbent, D. E. (1971). *Decision and stress.* London: Academic Press.

Buck, R. (1999). The biological affects: A typology. *Psychological Review, 106,* 301–36.

Cantor, J. P., & Zillmann, D. (1973). The effect of affective state and emotional arousal on music appreciation. *Journal of General Psychology, 89,* 97–108.

Caspy, T., Peleg, E., Schlam, D., & Goldberg, J. (1988). Sedative and stimulative music effects: Differential effects on performance impairment following frustration. *Motivation and Emotion, 12,* 123–38.

Chafin, S., Roy, M., Gerin, W., & Christenfeld, N. (2004). Music can facilitate blood pressure recovery from stress. *British Journal of Health Psychology, 9,* 393–403.

Coan, J. A., & Allen, J. B. (eds). (2007). *Handbook of emotion elicitation and assessment.* Oxford: Oxford University Press.

Cole, P. M., Martin, S. E., & Dennis, T. A. (2004). Emotion regulation as a scientific construct: Methodological challenges and directions for child development research. *Child Development, 75,* 317–33.

Dibben, N. (2004). The role of peripheral feedback in emotional experience with music. *Music Perception, 22,* 79–115.

Easterbrook, J. A. (1959). The effect of emotion on cue utilization and the organization of behavior. *Psychological Review, 66,* 183–201.

Ekman, P. (1973). Cross-cultural studies of facial expression. In P. Ekman (ed.), *Darwin and facial expression: A century of research in review* (pp. 169–222). New York: Academic Press.

Ekman, P. (1994). Moods, emotions, and traits. In P. Ekman & R. J. Davidson (eds), *The nature of emotion: Fundamental questions* (pp. 56–8). Oxford: Oxford University Press.

Ekman, P., Levenson, R. W., & Friesen, W. V. (1983). Autonomic nervous system activity distinguishes among emotions. *Science, 221,* 1208–10.

Erber, R., Wegner, D. M., & Therriault, N. (1996). On being cool and collected: Mood regulation in anticipation of social interaction. *Journal of Personality and Social Psychology, 70,* 757–66.

Flath-Becker, S. (1987). *Musikpräferenzen in Situationen psychischer Anspannung.* Frankfurt am Main, Germany: Lang.

Flath-Becker, S., & Konečni, V. J. (1984). Der Einfluss von Stress auf die Vorlieben für Musik. *Musikpsychologie, 1,* 23–52.

Forgas, J. P., & Ciarrochi, J. V. (2002). On managing moods: Evidence for the role of homeostatic cognitive strategies in affect regulation. *Personality and Social Psychology Bulletin, 28,* 336–45.

Friedman, M., & Rosenman, R. H. (1974). *Type A behavior and your heart.* New York: Knopf.

Frijda, N. H. (1988). The laws of emotion. *American Psychologist, 43,* 349–58.

Frijda, N. H. (2005). Emotion experience. *Cognition & Emotion, 19,* 473–97.

Gabrielsson, A. (2002). Perceived emotion and felt emotion: Same or different? *Musicae Scientiae, Special Issue 2001–2,* 123–47.

Gabrielsson, A., & Lindström, E. (2001). The influence of musical structure on emotional expression. In P. N. Juslin & J. A. Sloboda (eds), *Music and emotion: Theory and research* (pp. 223–48). Oxford: Oxford University Press.

Gaver, W. W., & Mandler, G. (1987). Play it again, Sam: On liking music. *Cognition & Emotion, 1,* 259–82.

Gross, J. J. (1998). The emerging field of emotion regulation: An integrative review. *Review of General Psychology, 2,* 271–99.

Hokanson, J. E., & Shetler, S. (1961). The effect of overt aggression on physiological arousal level. *Journal of Abnormal and Social Psychology, 63,* 446–8.

Isen, A. M. (1984). Toward understanding the role of affect in cognition. In R. S. Wyer & T. K. Srull (eds), *Handbook of social cognition* (Vol. 3, pp. 179–236). Hillsdale, NJ: Erlbaum.

Jenkins, C. D., Rosenman, R. H., & Zyzanski, S. J. (1974). Prediction of clinical coronary heart disease by a test for coronary-prone behavior pattern. *New England Journal of Medicine, 290,* 1271–5.

Juslin, P. N. (2000). Cue utilization in communication of emotion in music performance: Relating performance to perception. *Journal of Experimental Psychology: Human Perception and Performance, 26,* 1797–1813.

Juslin, P. N., & Laukka, P. (2004). Expression, perception, and induction of musical emotions: A review and a questionnaire study of everyday listening. *Journal of New Music Research, 33,* 217–38.

Juslin, P. N., & Sloboda, J. A. (eds). (2001). *Music and emotion: Theory and research.* Oxford: Oxford University Press.

Kahneman, D. (1973). *Attention and effort.* Englewood Cliffs, NJ: Prentice Hall.

Knobloch, S. (2003). Mood adjustment via mass communication. *Journal of Communication, 53,* 233–50.

Knobloch-Westerwick, S. (2006). Mood management theory, evidence, and advancements. In J. Bryant & P. Vorderer (eds), *Psychology of entertainment* (pp. 239–54). Mahwah, NJ: Erlbaum.

Knobloch, S., & Mundorf, N. (2003). Communication and emotion in the context of music and music television. In J. Bryant, D. Roskos-Ewoldsen, & J. Cantor (eds), *Communication and emotion: Essays in honor of Dolf Zillmann* (pp. 491–510). Mahwah, NJ: Erlbaum.

Knobloch, S., & Zillmann, D. (2002). Mood management via the digital jukebox. *Journal of Communication, 52,* 351–66.

Koelsch, S., Fritz, T., von Cramon, Y., Müller, K., & Friederici, A. D. (2006). Investigating emotion with music: An fMRI study. *Human Brain Mapping, 27,* 239–50.

Konečni, V. J. (1975a). Annoyance, type and duration of postannoyance activity, and aggression: The 'cathartic effect'. *Journal of Experimental Psychology: General, 104,* 76–102.

Konečni, V. J. (1975b). The mediation of aggressive behavior: Arousal level versus anger and cognitive labeling. *Journal of Personality and Social Psychology, 32*, 706–12.

Konečni, V. J. (1979). Determinants of aesthetic preference and effects of exposure to aesthetic stimuli: Social, emotional, and cognitive factors. In B. A. Maher (ed.), *Progress in experimental personality research* (Vol. 9, pp. 149–97). New York: Academic Press.

Konečni, V. J. (1982). Social interaction and musical preference. In D. Deutsch (ed.), *The psychology of music* (pp. 497–516). New York: Academic Press.

Konečni, V. J. (1984). Methodological issues in human aggression research. In R. M. Kaplan, V. J. Konečni, & R. W. Novaco (eds), *Aggression in children and youth* (pp. 1–43). The Hague, The Netherlands: Martinus Nijhoff.

Konečni, V. J. (1991). Psychological aspects of the expression of anger and violence on the stage. *Comparative Drama, 25*, 215–41.

Konečni, V. J. (1994). Interactive effects of music and visual art. In I. Deliège (ed.), *Proceedings of the 3rd International Conference for Music Perception and Cognition* (pp. 23–6). Liège, Belgium: ICMPC.

Konečni, V. J. (2003). Review of the book *Music and emotion: Theory and research*, P. N. Juslin & J. A. Sloboda (eds), 2001. *Music Perception, 20*, 332–41.

Konečni, V. J. (2005). The aesthetic trinity: Awe, being moved, thrills. *Bulletin of Psychology and the Arts, 5*, 27–44.

Konečni, V. J. (2008). Does music induce emotion? A theoretical and methodological analysis. *Psychology of Aesthetics, Creativity, and the Arts, 2*, 115–29.

Konečni, V. J., Brown, A., & Wanic, R. A. (2008). Comparative effects of music and recalled life-events on emotional state. *Psychology of Music, 36*, 289–308.

Konečni, V. J., Crozier, J. B., & Doob, A. N. (1976). Anger and expression of aggression: Effects on aesthetic preference. *Scientific Aesthetics, 1*, 47–55.

Konečni, V. J., & Doob, A. N. (1972). Catharsis through displacement of aggression. *Journal of Personality and Social Psychology, 23*, 379–87.

Konečni, V. J., & Gotlieb, H. (1987). Type A/Type B personality syndrome, attention, and music processing. In R. Spintge & R. Droh (eds), *Music in Medicine/Musik in der Medizin* (pp. 169–75). Berlin, Germany: Springer.

Konečni, V. J., & Sargent-Pollock, D. (1976). Choice between melodies differing in complexity under divided-attention conditions. *Journal of Experimental Psychology: Human Perception and Performance, 2*, 347–56.

Konečni, V. J., & Sargent-Pollock, D. (1977). Arousal, positive and negative affect, and preference for Renaissance and 20th-century paintings. *Motivation and Emotion, 1*, 75–94.

Konečni, V. J., Wanic, R. A., & Brown. A. (2007). Emotional and aesthetic antecedents and consequences of music-induced thrills. *American Journal of Psychology, 120*, 619–43.

Konijn, E. A. (2000). *Acting emotions*. Amsterdam, The Netherlands: Amsterdam University Press.

Krumhansl, C. L. (2002). Music: A link between cognition and emotion. *Current Directions in Psychological Science, 11*, 45–50.

Krumhansl, C. L., & Schenck, D. L. (1997). Can dance reflect the structural and expressive qualities of music? A perceptual experiment on Balanchine's choreography of Mozart's *Divertimento* No. 15. *Musicae Scientiae, 1*, 63–85.

Lai, H.-L. (2004). Music preference and relaxation in Taiwanese elderly people. *Geriatric Nursing, 25*, 286–91.

Lanzetta, J. T., Cartwright-Smith, J., & Kleck, R. E. (1976). Effects of nonverbal dissimulation on emotional experience and autonomic arousal. *Journal of Personality and Social Psychology, 33*, 354–70.

Larsen, R. J. (2000). Toward a science of mood regulation. *Psychological Inquiry, 11*, 129–41.

Lazarus, R. S. (1991). *Emotion and adaptation*. Oxford: Oxford University Press.

Marlatt, G. A., Kosturn, C. F., & Lang, A. B. (1975). Provocation to anger and opportunity for retaliation as determinants of alcohol consumption in social drinkers. *Journal of Abnormal Psychology, 84*, 652–9.

Martin, L. L., & Davies, B. (1998). Beyond hedonism and associationism: A configural view of the role of affect in evaluation, processing, and self-regulation. *Motivation and Emotion, 22*, 33–51.

Matthews, K. A., & Brunson, B. (1979). Allocation of attention and the Type A coronary-prone behavior pattern. *Journal of Personality and Social Psychology, 37*, 2081–90.

Miller, G. (2000). Evolution of human music through sexual selection. In N. L. Wallin, B. Merker, & S. Brown (eds), *The origins of music* (pp. 329–59). Cambridge, MA: MIT Press.

Niketta, R. (1990). Zum Einfluss kognitiver Belastung auf die Beurteilung von Musikstücken unterschiedlicher Komplexität. [The influence of cognitive load on the evaluation of music pieces of different complexity.] *Zeitschrift für experimentelle und angewandte Psychologie, 37*, 266–80.

North, A. C., & Hargreaves, D. J. (1997). Experimental aesthetics and everyday music listening. In D. J. Hargreaves & A. C. North (eds), *The social psychology of music* (pp. 84–103). Oxford: Oxford University Press.

North, A. C., & Hargreaves, D. J. (1999). Music and driving game performance. *Scandinavian Journal of Psychology, 40*, 285–92.

North, A. C., & Hargreaves, D. J. (2000). Musical preferences during and after relaxation and exercise. *American Journal of Psychology, 113*, 43–67.

Oatley, K., & Duncan, E. (1994). The experience of emotions in everyday life. *Cognition & Emotion, 8*, 369–81.

Oatley, K., Keltner, D., & Jenkins, J. M. (2006). *Understanding emotions* (2nd edn). Malden, MA: Blackwell.

Oliver, M. B. (2003). Mood management and selective exposure. In J. Bryant, D. Roskos-Ewoldsen, & J. Cantor (eds), *Communication and emotion: Essays in honor of Dolf Zillmann* (pp. 85–106). Mahwah, NJ: Erlbaum.

Ortony, A., & Turner, T. J. (1990). What's basic about basic emotions? *Psychological Review, 97*, 315–31.

Parkinson, B., Totterdell, P., Briner, R. B., & Reynolds, S. (1996). *Changing moods: The psychology of mood and mood regulation*. London: Longman.

Parrott, W. G. (1993). Beyond hedonism: Motives for inhibiting good moods and for maintaining bad mood. In D. M. Wegner & J. W. Pennebaker (eds), *Handbook of mental control* (pp. 278–305). Englewood Cliffs, NJ: Prentice Hall.

Persson, R. S. (2001). The subjective world of the performer. In P. N. Juslin & J. A. Sloboda (eds), *Music and emotion: Theory and research* (pp. 275–90). Oxford: Oxford University Press.

Posner, M. I. (1975). Psychobiology of attention. In M. S. Gazzaniga & C. Blakemore (eds), *Handbook of psychobiology* (pp. 441–80). New York: Academic Press.

Rentfrow, P. J., & Gosling, S. D. (2003). The do re mi's of everyday life: The structure and personality correlates of music preference. *Journal of Personality and Social Psychology, 84*, 1236–56.

Rickard, N. S., Toukhsati, S. R., & Field, S. E. (2005). The effect of music on cognitive performance: Insight from neurobiological and animal studies. *Behavioral and Cognitive Neuroscience Reviews, 4*, 235–61.

Saarikallio, S., & Erkkilä, J. (2007). The role of music in adolescents' mood regulation. *Psychology of Music, 35*, 88–109.

Schachter, S., & Singer, J. E. (1962). Cognitive, social, and physiological determinants of emotional state. *Psychological Review, 69*, 379–99.

Scherer, K. R. (2000). Emotions as episode of subsystem synchronization driven by nonlinear appraisal processes. In M. D. Lewis & I. Granic (eds), *Emotion, development, and self-organization: Dynamic systems approaches to emotional development* (pp. 70–99). Cambridge, UK: Cambridge University Press.

Scherer, K. R., & Zentner, M. R. (2001). Emotional effects of music: production rules. In P. N. Juslin & J. A. Sloboda (eds), *Music and emotion: Theory and research* (pp. 361–92). Oxford: Oxford University Press.

Siemer, M. (2001). Mood-specific effects on appraisal and emotion judgements. *Cognition & Emotion, 15*, 453–85.

Siemer, M. (2005). Moods as multiple-object directed and as objectless affective states: An examination of the dispositional theory of moods. *Cognition & Emotion, 19*, 815–45.

Simonton, D. K. (2001). Emotion and composition in classical music: historiometric perspectives. In P. N. Juslin & J. A. Sloboda (eds), *Music and emotion: Theory and research* (pp. 205–22). Oxford: Oxford University Press.

Sloboda, J. A., & O'Neill, S. A. (2001). Emotions in everyday listening to music. In P. N. Juslin & J. A. Sloboda (eds), *Music and emotion: Theory and research* (pp. 415–30). Oxford: Oxford University Press.

Slyker, J. P., & McNally, R. J. (1991). Experimental induction of anxious and depressed moods: Are Velten and musical procedures necessary? *Cognitive Therapy and Research, 15*, 33–45.

Sokolov, E. N. (1963). *Perception and the conditioned reflex*. New York: Macmillan.

Stanislavski, K. (1936). *An actor prepares* (trans. E. Reynolds Hapgood). New York: Theatre Arts Books.

Stanislavski, K., & Rumyantsev, P. (1975). *Stanislavski on opera*. New York: Theatre Arts Books.

Stemmler, G., Heldmann, M., Pauls, C. A., & Scherer, T. (2001). Constraints for emotion specificity in fear and anger: The context counts. *Psychophysiology, 38*, 275–91.

Steptoe, A. (2001). Negative emotions in music making: the problem of performance anxiety. In P. N. Juslin & J. A. Sloboda (eds), *Music and emotion: Theory and research* (pp. 291–308). Oxford: Oxford University Press.

Stravinsky, I. (1936/1998). *An autobiography*. New York: W. W. Norton.

Strube, M. J., Turner, C. W., Patrick, S., & Perrillo, R. (1983). Type A and Type B attentional responses to aesthetic stimuli: Effects on mood and performance. *Journal of Personality and Social Psychology, 45*, 1369–79.

Thayer, R. E., Newman, J. R., & McClain, T. M. (1994). Self-regulation of mood: Strategies for changing a bad mood, raising energy, and reducing tension. *Journal of Personality and Social Psychology, 67*, 910–25.

Thompson, R. L., & Larson, R. (1995). Social context and the subjective experience of different types of rock music. *Journal of Youth and Adolescence, 24*, 731–44.

Tice, D. M., & Bratslavsky, E. (2000). Giving in to feel good: The place of emotion regulation in the context of general self-control. *Psychological Inquiry, 11*, 149–59.

Tice, D. M., & Wallace, H. (2000). Mood and emotion control: Some thoughts on the state of the field. *Psychological Inquiry, 11*, 214–17.

Velten, E. (1968). A laboratory task for induction of mood states. *Behavior Research and Therapy, 6*, 473–82.

Wells, A. (1990). Popular music: Emotional use and management. *Journal of Popular Culture, 24*, 105–17.

Zillmann, D. (1978). Attribution and misattribution of excitatory reactions. In J. H. Harvey, W. J. Ickes, & R. F. Kidd (eds), *New directions in attribution research* (Vol. 2, pp. 335–68). Hillsdale, NJ: Erlbaum.

Zillmann, D. (1988). Mood management: Using entertainment to full advantage. In L. Donohew, H. E. Sypher, & E. T. Higgins (eds), *Communication, social cognition, and affect* (pp. 147–71). Hillsdale, NJ: Erlbaum.

Zillmann, D. (2000). Mood management in the context of selective exposure theory. In M. E. Roloff (ed.), *Communication yearbook 23* (pp. 103–23). Thousand Oaks, CA: Sage.