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EMOTIONS AND ASSOCIATIONS EVOKED BY UNFAMILIAR MUSIC

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Introduction

How do musical emotions depend on preference? A paradoxical feature of art and music is that negative emotions may be preferred (cf. Schubert, 1996): an emotion can simultaneously be positive on one level (artistic appreciation) and negative on another (valence). Emotions also depend on familiarity. Listeners experience more diverse emotions, and experience these more strongly, in familiar by comparison to unfamiliar musical styles (Gabrielsson & Lindström Wik, 2003). But listeners also experience more or less the same emotions in music of their own culture as listeners from another culture listening to the same music (Balkwill, Thompson, & Matsunaga, 2004).

We addressed these issues by presenting listeners with unfamiliar music, having them rate their liking for it and its familiarity for them, and having them write down the emotions and associations they experienced while listening to the music.

Method

The experiment was part of a compulsory first-year unit within the musicology degree program at the University of Graz, called "Listening to broaden musical horizons" (*Horizont erweiterndes Musikhören*). Most of the 43 enrolled students attended each 90-minute session.

Over several weeks, 17 pairs of students presented 3 short music examples each. The students had been asked to ensure that the three pieces conformed to a specific, named style that was homogenous, acoustically recognizable, and accepted as "music" by an identifiable social group. For the other students in the class, the music was to be unfamiliar, but also interesting and challenging. Since most familiar music contains major and minor triads and tonality, the chosen music was not to include these elements. Since the aim of the course was to broaden musical horizons, the music was to be clearly unsuitable as background music for familiar situations such as a regular western party. The examples were to be performed or composed by at least two different (groups of) representative exponents of the chosen style.

The styles of music chosen by the students fell into two groups: (predominantly) modern western (11 styles) and (predominantly) non-western (6 styles). The modern western styles were designated by the students as "early computer music", "Peter Lackner's canonical principle", "instrumental music of Olga Neuwirth", "jew's harp", "Japanoise", "Clicks'n Cuts", "Beat Furrer", "György Ligeti – Steve Reich", "Ambient Sound", "Stomp" and "Free Jazz". The non-western styles were designated "Tibetan Buddhism", "Huli", "Aka pygmies", "Sioux Indians", "Capoeira" and "Shakti".

No background information about the music was given before its presentation. While listening to each piece, each student filled out a response sheet as follows (all in German).

Qualitative data:

1. emotions experienced while listening to the music
2. associations (e.g. with situations, cultural contexts, films…)
3. recognizable sound sources (instruments, voices, devices)
4. recognizable structures in pitch und time

Quantitative data:

5. (un-) familiarity (*Vertrautheit*):
   1 = sounds familiar *as music*, 2 = neutral, 3 = sounds foreign *as music*
6. (dis-) liking (*Gefallen*):
   1 = I like it *as music,* 2 = neutral, 3 = I do not like it *as music*

To make tasks 1 and 2 clearer, each student had been given a list of 200 words at the beginning of the course, in which emotions, associations, nouns and adjectives were mixed. During the experiment, students discarded the list and wrote down, spontaneously and creatively, the first emotions and associations that occurred to them.

Results

In the present report, we analyse only data from items 1, 5 and 6 from the above list. Moreover, the data for item 1 is restricted to the first word or phrase noted by each listener.

Familiarity versus liking. Entries in Table 1 below are total numbers of response sheets bearing the chosen combination.

Table 1a: Familiarity versus liking for 11 modern western styles

	I like it	*neutral*	*I don't like it*
sounds familiar	105	87	58
neutral	95	181	134
sounds foreign	47	79	246

Table 1b: Familiarity versus liking for 6 non-western styles

	I like it	*neutral*	*I don't like it*
sounds familiar	131	46	49
neutral	70	91	44
sounds foreign	32	28	58

Table 1 suggests that participants generally preferred musical styles that seemed familiar (cf. Peretz et al., 1998), and this tendency was largely independent of style. The correlation coefficient between familiarity and liking was 0.36 for the modern western styles and 0.27 for the non-western styles (both $p<0.01$).

Selection of emotion words. Our raw data included about 750 different emotion words and 30 phrases. It also included a range of parts of speech (adjectives, nouns, participles etc.). Analogous to Shaver et al. (2001), we first converted all emotion words to (German) nouns. Groups of words with the same stem and about the same meaning were assigned to the same noun. Next, we checked how often words corresponding to each of these nouns occurred in the data. If this number was less than or equal to three, the noun was omitted from the list. The result was a list of 210 nouns comparable to Shaver's list of 213 emotion names.

Assignment of emotion words to emotion categories. We then reduced the list to a smaller number of emotion categories as follows:

1. Ten native German speakers (or groups) were given the 210 nouns on slips of paper and asked (i) to group similar nouns into any number of groups and (ii) to choose one of the nouns in each group as a label. We then subjectively compared the group labels. By a process of comparison and negotiation, we decided on 21 emotion categories.
2. Ten different native German speakers were asked to assign the 210 nouns to these 21 categories. On the basis of their data, we assigned a given noun to a given emotion category when a majority (i.e. 6 people) independently made the same assignment. For example, we assigned *Ablehnung*, *Abneigung* and *Abscheu* to the category *Abscheu*. Nouns that were not clearly assigned by this procedure were omitted from the list.

Data analysis. We now returned to the original data – the first word or phrase written in response to item 1 - and counted the number of emotion words corresponding to each of the 21 emotion categories, for each of the 51 pieces of music. Of a total of 2193 words and phrases, 890 could be classified in this way (that's about 17 per piece). The remaining 1303 were regarded as missing data. Table 2 shows the 21 emotion categories in the original German (column 1), an English translation (column 2), the number of nouns that we assigned to the category (column 3), and the total times a word or phase corresponding to one of these nouns occurred in the original data (column 4). Column 5 shows the closest equivalent emotion in Shaver et al. (2001), Figure 1.1, p. 34-35 ("results of a hierarchical cluster analysis of 135 emotion names"); emotions that they regard as "basic" are in italics.

Table 2. The 21 emotion categories

Emotion category	**English translation**	**Assigned nouns**	**Total occurrences**	**Shaver equivalent**
Abscheu	antipathy	3	3	disgust
Aggression	aggression	8	41	(anger)
Angst	fear	15	150	*fear*
Bewegung	movement	15	50	-
Chaos	chaos	4	61	-
Feierlichkeit	festivity	3	12	pride
Fremdheit	foreignness	1	3	-
Freude	gladness	11	118	*joy*
Hast	haste	5	43	-
Intensität	intensity	7	72	-
Langeweile	boredom	10	88	-
Leid	suffering	3	26	suffering
Liebe	love	4	8	*love*
Neugierde	curiosity	3	25	-
Ruhe	calm	7	88	contentment
Spaß	fun	3	18	zest
Spiritualität	spirituality	5	25	enthralment
Traurigkeit	sadness	8	32	*sadness*
Überraschung	surprise	1	2	*(surprise)*
Wahnsinn	madness	4	9	-
Wut	anger	3	16	*anger*

Table 2 suggests that our categories (like those of Shaver et al.) differ considerably in size. For this reason, we confine further quantitative analyses to comparisons within (rather than between) categories, and to the larger categories.

The following categories of Shaver et al. did not correspond directly to any of our categories: *lust, relief, enthusiasm, optimism, pride, irritation, envy, longing, disappointment, shame, neglect, sympathy, horror, nervousness, torment*. While most of these concepts, or similar concepts, did occur in our list of 210 emotions, some (such as *envy* and *shame*) seemed to be completely absent. Conversely, the following categories in our study did not correspond exactly to categories of Shaver et al.: *movement, chaos, haste, intensity, boredom, curiosity, madness*. These observations are consistent with the idea that the frequency of specific emotions is different in music and in everyday contexts; emotions such as *nostalgia*, *enchantment*, *movement* and *arousal* may be more common in music (Scherer et al, 2001).

The emotions evoked by music of different degrees of liking and familiarity are summarized in Table 3. Only emotion categories that were selected relatively often and varied significantly as a function of liking or familiarity (χ^2 with $p>0.05$) are included in the table (exceptions in italics).

Table 3. Emotions evoked as a function of familiarity and of liking

	familiarity			liking		
	familiar	neutral	foreign	liked	neutral	disliked
Angst (fear)	30	50	70	23	49	78
Bewegung (movement)	27	15	7	23	19	7
Chaos (chaos)	10	28	23	8	17	36
Freude (joy)	56	47	15	70	31	17
Intensität (intensity)	*19*	*27*	*26*	21	32	19
Langeweile (boredom)	*31*	*24*	*33*	11	29	48
Ruhe (calm)	26	50	12	43	36	9

Thus, familiarity and liking were associated with movement, joy and calm, and foreignness and dislike were associated with fear and chaos. Disliking was also associated with boredom.

In a further analysis, we calculated the mean foreignness and liking rating on the above 3-point scales for music assigned to each of the 21 emotion categories. Music that was

- foreign (mean rating $\geq$ 2.2) was associated with fear, madness and anger;
- familiar (mean rating $\leq$ 1.8) with joy, curiosity and fun;
- disliked (mean rating $\geq$ 2.2) with aggression, fear, chaos, boredom, pain, madness;
- liked (mean rating $\leq$ 1.8) with movement, joy, love, calm and fun.

Discussion

Our analysis suggests that it is possible to associate specific emotional qualities with general tendencies to like or dislike music or to perceive it as familiar or foreign. However, it is difficult to generalize the findings beyond the specific musical styles in our experiment (which had been chosen to sound as foreign as possible) and the specific preferences of our listeners (all of whom were in the early stage of a musicology degree).

It is of course not generally true that music evoking perceptions of movement, joy, calm, love and fun is preferred. Although much pop music may tend in this direction, the music of successful western classical composers often does not. Our preliminary analysis does not shed any light on why (and under what circumstances) negative emotions are preferred.

In our analysis we made no attempt to separate the emotions experienced while listening from quasi-objective appraisal of emotional content. Although our listeners were asked to report the emotions they actually felt, they presumably often reported the emotions they thought would normally be evoked by the music.

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