THE EFFECTS OF MUSIC ON THE PERCEPTION OF A SHORT FILM'S NARRATIVE STRUCTURE:
HOW THE EARS TELL THE EYES WHAT TO SEE

K.-E.Behne

Hochschule für Musik und Theater Hannover, Germany

ABSTRACT

The effects of music on the viewing of films/videos have been demonstrated in numerous empirical studies. In most cases, the film excerpts used were silent pictures often using stationary camera angles (faces, landscapes), so that the effects could as well have been demonstrated with photographs (as in the often mentioned Kuleschow effect). The goal of the experiment reported here was to test if the use of different sound tracks would influence the audiences' interpretation of the narrative structure of a short film.

337 students, aged 11 to 17 viewed one of two versions of a short film (about 4 minutes in length), differing only in their sound tracks. The musical backdrop was either a piece of popular-style music or taken from J. Brahms' "Hungarian Dances." Subjects were asked to provide short story lines for the film and to give their impressions of the protagonist on rating scales.The qualitative data revealed an influence of the two types of music on the interpretation of events, cluster analysis of the rating data yielded large differences which could not be explained by demographic variables.

Future research should pay more attention to the effects of music on the narrative aspects of films and take into account media experience when trying to explain individual differences in the interaction of eyes and ears.

1. BACKGROUND

The experiment was designed to demonstrate if and how the use of different soundtracks will influence the perception of a film's narrative structure. One might expect experimental studies on the effects of music in films or videos to be rare because they often require especially produced film material. But in fact, a remarkable number of research has been done, as the review of Bullerjahn (2001) has demonstrated. The film excerpts used were mostly silent pictures showing a preference for stationary camera angles. But if we want to understand the mechanisms of film comprehension, it is necessary not only to scrutinize single shots, but also to give attention to the films' stories, to their narrative structure.

Perhaps we may assume two sorts of effects of film music:

1. The" Emotional Effect", affecting specific aspects, such as the expression of a face, or the mood of a landscape. It has been demonstrated in various studies, most of them using a stationary camera angle or even photographs, as in the often cited Kuleschow effect.

2. The "Epic Effect", influencing the highly complex processes of interpreting the whole of the film's narrative structure, involving cognitive as well as emotional aspects.

The design of the experiment reported here offered possibilities for both sorts of effects to appear.

2. METHOD

A short film sequence of about four minutes, produced especially for this experiment, shows how a stylish car is parked in the town centre. An equally stylish young woman gets out of the car and enters a jeweller's shop. She talks to the saleslady and is shown several rings. When the shop assistant leaves her customer for a short moment, the camera shows the young woman from behind, how she makes a movement with her right arm in a way that might indicate she is taking something from the counter. As she leaves the shop it is not evident whether she has bought anything or if she perhaps has stolen something. She walks a short way, then stops to look with a contented smile at a ring on her finger. She then gets into her car and drives off.

The sequence is centred round the crucial, ambiguous scene when the customer is left alone for a moment. The aim of the experiment was to show if different musical soundtracks could induce different interpretations of this situation.

VERSION A (THEFT). In the beginning and at the end (street scenes) a synthesizer-generated, slow, pop-style music was played, with a jumping bass, interspersed with piano patterns. It is the sort of music that might well be the background to the introductory scenes of a crime thriller, but not necessarily so. In contrast, the scenes inside the shop were underlaid with extended, sinister spheric sounds, indicating suspense and caution.

VERSION B (BUY). In this 'harmless' version, there is no contrast between the music for the different scenes (outside/inside/outside), but only a small pause. It is a lively, stirring music (taken from the orchestrated Hungarian Dances 1, 3 and 5 by Johannes Brahms), spreading an optimistic, unsuspicious mood, carrying an atmosphere of enjoyment of life's good things which might be associated with the affluence necessary to buy a valuable ring.

The experiment was conducted in the early nineties (Behne 1994), involving 337 students of different types of schools, aged 10 to 16[1]. For organizational reasons it was part of an extensive

---

[1] Many thanks to Monika Sticherling and Andreas C. Lehmann for conducting the experiment!

70 minutes experiment concerning video-clips. The students were split up into two random groups of equal size and gender distribution. Group I was shown Version A, Group II Version B. At no time the part of the music was brought to attention.

When the students had seen the film sequence (with either Version A or B as soundtrack), they were invited to write down a short note describing what they thought might possibly have happened before and after the scenes of the film. It was expected that these descriptions would show whether the incident was perceived as harmless or criminal. Students were allowed five minutes for this task. Next, they were given a questionnaire. Firstly, eight written questions had to be answered. They were pertaining to every-day media-use, an appraisal of the film's 'heroine' (using six rating scales), as well as to how much attention had been given to the musical soundtrack.

When this task was finished, students were shown video-clips for approximately 20 minutes. Then six musical excerpts of 10 to 15 seconds were played to each group. Three were identical with the music used in the film and had to be recognized, three were similar. (For Version A: Excerpts from 'Open Your Eyes' by 'Earth, Wind & Fire' / Version B: Hungarian Dances 2,12+17) .

The data thus raised were then used to investigate the effects of the music on visual impression by analysing the ratings on the six uni-polar scales, and the effects on the perception of the narrative structure by interpreting the students' 'stories'. Furthermore, it was to be ascertained to which extent these two complexes of linked variables were mutually conditional, or affected by unlinked variables, such as film preferences, attention attitude, recognition of the music.

3. RESULTS

Analysis of invented plots. To begin with, the stories describing what the students imagined might have happened before and after the scenes shown in the film were divided into nine categories, regardless of the soundtrack version.

1. Description of the film sequence   n = 2

2. Description of harmless, insignificant events   n = 115

3. The ring is bought, the young woman pictured as living in luxury   n = 52

4. The ring is bought, but with illegal means (counterfeit money)   n = 6

5. The ring is bought, but other persons are criminally involved   n = 2

6. Theft is held possible   n = 7

7. The ring is neither bought nor stolen   n = 4

8. The ring is stolen   n = 94

9. The ring is bought, but the incident ends disastrously   n = 52

First of all, the frequencies reported for the whole sample show that in being sufficiently ambiguous the film fulfilled the elementary condition for any experiment concerning the effects of music. As the majority of the categories initially set up showed only very few entries, only categories 2, 8 and 9 were kept and the remaining versions assorted to these three, according to their tendency.

A scrutiny of the combination of those three categories of stories with the two soundrack versions A and B yielded the distribution in Tab.1

	VERSION A (Pop)	VERSION B (Brahms)	TOTAL
Harmless, insignificant events	85	103	188
Theft	66	28	94
Mishap	13	39	52
	164	170	334
Chi-square = 29.99, p = 0.000			

Tab.1: Frequencies of categories for both music versions

There was evidence of a highly significant effect of the background music, but only partly as expected. Version A did indeed evoke the impression that a theft had been committed twice as often as Version B, but 85 out of 164 did not associate the music with criminal happenings.

The carefree music of Version B on the other hand, although associated by a majority with harmless events, did not preclude ideas of theft (28 out of 39) or mishaps of all sorts, envisioned by a surprising 39 out of 170.

This category comprised all sorts of criminal incidents (mugging, theft of car or ring by a third person) and would rather have been expected as an effect of the 'thriller-like' Version A.

Reactions to the Brahms music were highly complex. Some students may have mistrusted the air of opulence and abundance suggested by Version B and intended to introduce some of the realities of life into the story by letting it take a bad course. This strategy could stem from the wish not to appear naive, but to show a certain sophistication. The display of luxury and affluence may have provoked others to put a spoke into the wheel of too much good fortune and to 'punish' the young lady out of envy for her care-free life by inventing all sorts of disasters for her.

Another group of students may just have thought a harmless situation boring in a film and felt the urge to let something happen, regardless of the musical soundtrack.

This pattern of results (Version A high on theft, Version B slightly higher on harmless stories, surprisingly high on mishaps) appeared in all age-groups and for all types of schools. As shown in Tab.2 it emerged most clearly for the children aged 10 to 12.

Less strongly developed, the same trend showed in the results for grammar school (Gymnasium) students (p < 5%) and secondary modern school (Realschule) students (n.s.).

Gender effects were slight: boys were more likely to describe situations of theft. Girls wrote longer texts. So did grammar school students as compared to the 10 to 12 year olds. Neither the music nor the category of stories had effects on the length of the texts.

	VERSION A (Pop)	VERSION B (Brahms)	TOTAL
Harmless, insignificant events	30	37	67
Theft	26	4	30
Mishap	4	24	28
	60	65	125
Chi-square = 30.99, p = 0.000			

Tab.2.: Frequencies of categories for both music versions (for youngest students)

Appraisal task. Fig.1 shows assessment of the heroine on six unipolar semantic differential rating scales for each soundtrack version separately. The resulting profiles are almost totally identical, the only difference found with the help of variance analysis (ANOVA) were slightly higher ratings on the item 'self-assured' for Group I (p = 0.012) and on 'reliable' for Group II (p = 0.007).
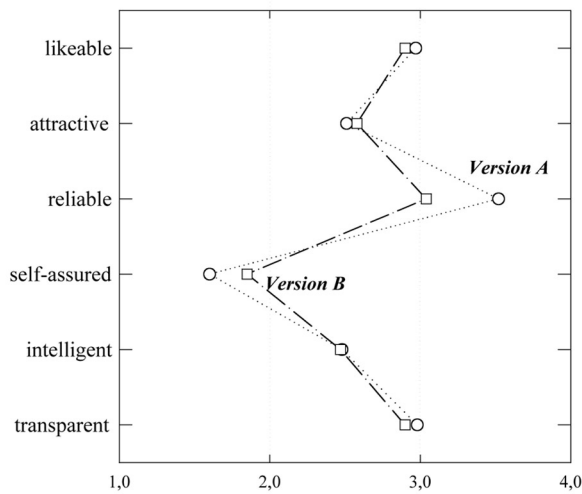

Fig.1: Semantic differential mean ratings for both music versions.

Because of the size of the sample, these slight differences are yet significant and fulfill our expectations as to the effects of the music, nevertheless they hardly carry great weight.

What seems more important, is that the young woman in the film finds no sympathies with the subjects. Ratings are high on the negative end of almost all scales, only with the exception of 'self-assured' and - less so - 'intelligent'. Perhaps this elegant young

lady seemed to be so much part of an alien adult world that none of the 10 to 16 year-olds could identifiy with her.

However, cluster analysis (SPSS:Ward[2]) of these data (Fig.2, „1/27" means Cluster Nr.1 with n=27 subjects) showed five extremely different types of appraisal. Many give an overall negative assessment, conceding only a single positive attribute (‚self-assured', ‚transparent'), only a minority of 48 subjects give a totally positive vote. Divergence of personal assessments is unusually high and could only in a slight degree be explained by the different musical conditions.
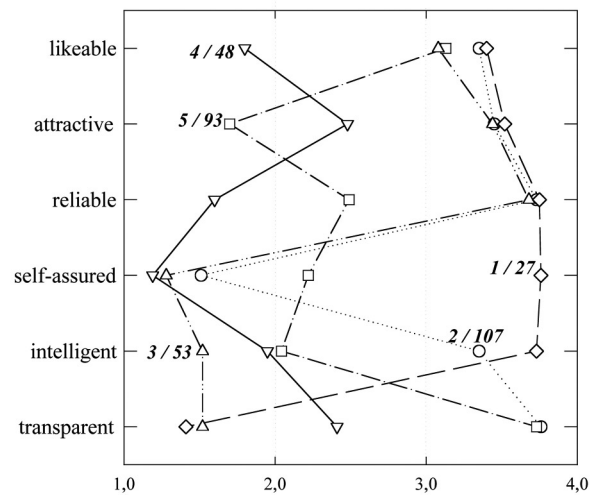
Fig.2: Semantic differential ratings (cluster-analyzed)

Recognition task. For every student an error-index was worked out from the number of musical excerpts not recognized or wrongly attributed[3]. Its maximum was 6 (6 test items).

Table 3 shows how many students had 0 - 6 errors in each of the musical soundtrack conditions.

Number of errors	0	1	2	3	4	5	6
Version A	21	80	52	9	1	0	0
Version B	6	48	66	23	14	3	0
	27	128	118	32	15	3	0

Tab.3: Number of errors for both music versions

All in all, the recognition task was solved quite well. 82% of the students made two or less mistakes. The higher rate of errors in Group II (Version B) can be explained by the stronger similarity

---

[2] As to the use of cluster analysis see Behne (1986, chapt.2.5.).

[3] A separate analysis of 'hit' and 'false' rates showed no significant differences.

of the distractors (taken from the same cycle of compositions). No relations could be found between the categories of stories and the appraisal ratings of students with extremely high or low error-index.

One remarkable result was the low recognition rate for the crucial scene in the jeweller's shop. This may be due to the fact that the music in the middle of the sequence is slightly different from that at the beginning and end. It seems more plausible, however, to assume that the happenings of this scene absorbed more attention, so that the music was less well remembered.

We now could examine how remembering the thriller-like, spheric sounds of Version A influenced the interpretation of the ambiguous scene.

	Music remembered	Music not remembered	TOTAL
Harmless, insignificant events	21	63	84
Theft	13	53	66
Mishap	3	10	13
	37	126	163
Chi-square = 0.59, n.s.			

Tab.4.: Effect of remembering the music on category

We can see that remembering the 'thriller' music did not evoke increased criminal fantasies. This negative result apparently indicates that awareness of the music had no influence on the interpretation of the narrative structures, that cognitive processes induced by the music may happen consciously as well as unconsciously.

Neither could we find effects of retrospectively stated attention on the musical soundtrack. Awareness of the music in the shop-scene (Question Nr.5), in the beginning and at the end (Nr.6), as well as of the effects of the music (Nr.7, answered overwhelmingly in the affirmative) had no noticeable effects.

In Version B (Brahms), the music at the beginning and end got significantly less attention and the question as to the effects of the music was answered significantly less positively. The item asking for a description of the music in the shop-scene could not be evaluated as the answers turned out to be extremely vague.

4. CONCLUSIONS

Assuming that two effects of film music are possible, the aim of this experiment was to demonstrate the "Epic Effect" of the music as influencing the interpretation of the film's story, and indeed a remarkable effect of the music on the perception of the narrative structure could be found (Tab. 1).

The "Emotional Effect" was expected to show in the appraisal of the heroine, but the music yielded hardly any effects on the ratings (Fig.1). This result seems less surprising when we consider that the plot was constructed, and the music selected, with the explicit intention to demonstrate not so much the emotional, but the epic effect.

Awareness of the music was not relevant for either the interpretation of the film's story or the appraisal of the heroine.

On the whole, the data collected were extremely divergent (Tab.1, Fig.2), indicating individually highly different interpretations of the film's story. This may be because of widely varying media experience, an aspect that should be more closely examined in further studies.

5. REFERENCES

1. Behne, K.-E. (1986). *Hörertypologien.* Regensburg: Bosse Verlag.

2. Behne, K.-E. (1994). Schönheit oder Engagement? Über die notwendigen visuellen Attribute eines Musikers. In: K.-E.Behne (ed.), *Gehört - Gedacht – Gesehen* (pp. 47-70). Regensburg: ConBrio.

3. Bullerjahn, C. (2001). *Grundlagen der Wirkung von Filmmusik.* Augsburg: Wissner Verlag.

4. Bullerjahn, C., & Güldenring, M. (1988). An empirical investigation on effects of film music using qualitative content analysis. *Psychomusicology, 13,* 99-118.