# *Exploratory Study on Physiological Reactions and Linked Affections of Listeners of Modern Music*

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## Abstract

We started from our subjective experience of a striking physiological reaction when listening to certain (quite successful) modern pop and rock songs. In our opinion, this physiological reaction is the most important factor that determines if a song pleases an audience. This can lead to massive sales of records and high rankings on music charts.

This empirical study explores the question if an accumulation of “preferred passages” can be found when listening to certain modern pop and rock music. (A physiological reaction probably is the reason for the preference of certain passages.) Our results prove the existence of such accumulations without any doubt.

Additionally, we examined the question if these accumulations intersect with prognoses made by the researchers. Are these accumulations accidental? If not, which are the criteria for their formation? Our results show that the exploratory accumulations can be predicted intuitively, but not all of them and not without errors. Especially there are individuals that hardly reacted to the sample music, and for them our prognoses do not fit at all. Only assumptions can be made about the criteria for passages that attracted attention as accumulations of conjectured physiological reactions. There are four factors: increase of musical density (for example, chorus passages); musical intensification of melody or harmony; increase of rhythm; increase of volume.

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## Introduction

Entertainment is a very important economic sector today, especially the music industry. In this economic sector the competition is very tough and the musical affections of the consumers are followed quite meticulously by registering the sales of music records; this leads to the well-known music charts. To sell a lot of records means to make a lot of money, thereby a lot of musicians, producers, etc., are trying to compose and record songs that are thought to rise high in the charts. (This means also that the personal musical interests of musicians, producers, etc., probably cannot be realized.)

What has to be considered when composing such music? Which are the properties of a commercially successful song? Without any doubt, besides the music itself the whole presentation of a band or an artist has a great importance, promotional video clips, for example. But the song itself, can it be rated on a "commercial hit" range—if possible before a potential release? This is the topic of this study.

We have had the personal experience that certain passages of pop and rock songs (which often rank highly in the music charts) can produce a striking physiological reaction, which is frequently called "adrenaline push" by nonprofessionals. (In the following the shortcut APP means "Adrenaline Push Passage", a term created by the authors.) We do not know if this description corresponds to any neurobiological processes, but as HARRER & HARRER (1977) mentioned already, listening to music can influence the autonomic nervous system. To which extent the change is depends on the general reactivity (constitution, age, sex), the emotional reactivity, and the affection for the music. Additionally, two situations have to be distinguished: one concentrates *emotionally* on the music, or else *intellectually* (this means one tries to analyze the music).

In our opinion, these APPs (which can lead, for example, to goose pimples) are a main factor of the success of a song, because the following relation applies: The more and the more intense APPs a song has, the more people will like this song. Additionally, it is in our opinion that these passages can be predicted intuitively, so the accumulations in an exploratory study could be defined in advance.

KONECNI (1982) stated that the perception of music depends strongly on the actual emotional state of the audience. Nevertheless we postulate that APPs are independent of affections and interests of listeners and will always occur on the condition that subjects concentrate emotionally on the sample music. (Just one limitation: The effect seems to be "worn out", probably by habituation. After listening to same passage for 20 or more times, the effect decreases considerably.)

To reveal the real existence of APPs and to determine their significance, it is necessary that APPs be explored in detail. There are two possibilities:

1. *Deductive approach*. One looks for as many APPs as possible and tries to analyze them by the following criteria: harmony, harmony change, melody lines,

speed, speed change, rhythm, sound (harmonic wave structure), scales, song structure, lyrics, general loudness, dynamics, external acoustic conditions, (headphones, speakers), etc. It is obvious that this procedure is very time consuming.

2. *Inductive approach*. One could try to explore systematically the physiological effects of each of the above factors on humans. Thereby one has to make sure that only one factor is varied at the same time in order to measure the corresponding physiological changes. This procedure is quite time consuming too, because APPs probably depend on several interlinked factors.

To measure physiological changes when listening to music, HARRER ET AL. (1977) propose the following methods: pulse rate, breath rate, psychogalvanic reflexes, muscular activity. HARRER ET AL. (1977) emphasize that up to now it not be possible to assign changes of the autonomic nervous system to emotional processes. For this reason we decided to proceed in an exploratory way. We assumed the basic condition that APPs cause a “pleasant, good sensation”. That's what we found out by preliminary examinations on ourselves.

Thus we would like to ask the following questions:

1. Are so called APPs (Adrenaline Push Passages, a striking human physiological reaction to, e.g., certain passages of music), provable in a secondary way as an accumulation of “preferred passages” statements of subjects?

2. Do our predictions of APPs on sample songs correspond to accumulations of statements of subjects?