Genre-related Dynamics of Affects in Music

Pasi Saari,[*1] Tuomas Eerola[*2]

[*]*Music Department, University of Jyväskylä, Finland*
[1]`pasi.saari@jyu.fi`, [2]`tuomas.eerola@jyu.fi`

ABSTRACT

Background

Past research in the perception of affects in music has primarily been based on rather limited music materials both in terms of music genres covered and amount of examples used. Yet we are aware of large differences in functions, typical listener profiles and affective connotations of music across music genres.

Aims

The present study considers the contribution of music genre to the perception of affects in music and seeks to uncover systematic patterns of affects and their musical correlates across a variety of genres. This is motivated by a recent study (Eerola, 2011) that suggested that different genres use divergent ways to convey moods in music. To explore the conceivable dynamic relations between genres and moods, significantly larger datasets than utilized in the past research need to be utilized. For this, we turn our attention to music collections already annotated by millions of users in social music services. Moreover, the aim of the study is to assess whether the affective content provided by tags in such a social media service is congruent with the more traditional participant ratings of affect characteristics. Finally, we also seek to assess whether moods can be explained by computationally extracted musical features with and without considering their relation to music genre.

Method

Song-level tags related to genre and mood were retrieved for over one million songs in the Last.fm social music catalogue. Latent Semantic Analysis was applied separately to the genre and mood tags to infer semantic representation of the songs and to optimize genre and affect prevalence. Based on the analysis, 6 genres (electronic, pop, rock, metal, jazz, and folk) and 9 affects (including energy, happiness, sadness, anger and sentimentality) were chosen for further study. A set of 600 tracks, balanced in terms of genre and affect, was chosen for a listening experiment, where a total of 29 participants rated the excerpts in terms of perceived affects and genre typicality. Also, a set of 129 acoustic and musical features were extracted using MIRtoolbox (Lartillot & Toiviainen, 2007) for investigating the musical substrates of the moods within the genres.

Results

First the listener ratings and the corresponding semantic representations were compared by means of correlations without considering the differences in genre. This resulted to a low (happy $r=.42$) to high (peaceful $r=.69$) correlations between ratings and semantics. Correlations between mean ratings of each affect showed strong (e.g. energetic/relaxed $r=-.95$), but also unexpectedly weak (e.g. happiness/sadness $r=-.46$) relationships. However, when the same correspondences are investigated within the genres, a more complex pattern of correlations emerges. In certain genres, affects do operate in the traditional manner – such as in strongly negative correlation between happiness and sadness within folk and pop, but in electronic and metal, however, such relation disappears due to non-relevance of certain affects or shift in the relationship of the affect within the genre.

To estimate the mood prediction rates with the musical features, regression models were constructed with a robust cross-validation scheme for each mood using either all features alone, genre information alone, or features and genre information in the model construction. This analysis demonstrated that features alone could explain the least amount of variance in moods ($R^2=.22$ on average) whereas the genre information was slightly better ($R^2=.27$), and the combination of genre and musical features outperformed the two ($R^2=.35$). The modest prediction rates obtained here relate to sparse nature of the semantic structures obtained via Latent Semantic Analysis in this kind of data. However, the implication is that mere presence of genre information is critical to the success of such models.

Conclusions

The results show that musical genre is indeed an important contributor in the affect perception in music. Also, the results suggest that the large amounts of data available from social media can be harnessed to study these questions since the traditional subjective ratings provides reasonably similar patterns than those obtained by the analysis of the semantic content. Finally, the genre information alone was demonstrated to be a more significant predictor of moods than the combination of several musical features.

Keywords

Affect, genre, social media, semantic analysis, musical features.

REFERENCES

Eerola, T. (2011). Are the emotions expressed in music genre-specific? An audio-based evaluation of datasets spanning classical, film, pop and mixed genres. *Journal of New Music Research*, 40(4), 349–366.

Lartillot, O. & Toiviainen, P. (2007). MIR in Matlab (II): A Toolbox for Musical Feature Extraction From Audio. *International Conference on Music Information Retrieval*, Vienna, 2007.