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## Review on a Microcosm of Musical Expression Part II

In this paper, the author presented a study of measuring patterns of expressive dynamics in bars 1-5 of 115 commercially recorded performances of Chopin piece. In part I, the author concluded that a grand average timing pattern can be found from these performances. However, each performance can be approximated as a combination of four individual strategies. Furthermore, the author claims that timing is only one aspect of musical expression. Dynamics, the relative intensities of successive and simultaneous tones, is another important factor. However, it is extremely hard to estimate accurately the relative intensities of several simultaneous complex tones, where there is no good algorithm fits in to process it at present. As part of the compromise, the author utilizes the analysis to horizontal dynamic patterns as the metrics.

The author used a simplified score of the musical excerpt, which is divided into several horizontal strands or voices. Some preliminary analysis was performed to get some indication of the overall dynamic profile. The subjects in the experiments were from commercial recording and students recording. The peak amplitude following each note onset was then converted to peak sound levels (PSLs).

The author addressed three aspects of expressive dynamics, basic dynamic level, variability, and dynamic profile. The latter two factors were studied in the experiments. In terms of the variability, the author claims that the overall dynamic variability reflects in part the difference in average dynamic level between melody and accompaniment. And there was also significant dynamic variation within melody. The grand average dynamic profiles from commercial recording and amateurs showed high similarity. It also demonstrated that expert performers distinguished themselves by larger deviations from the common standard. The results also showed clear difference between melody and accompaniment, and pitch is one of several factors influencing expressing dynamics. Overall, the grand average dynamic profile shows that individual performance has a very similar pattern in dynamics.

The first principal component in each PCA accounted for a large percentage of variance, while additional PCs also played important roles. Five PCs were considered significant and being analyzed. PC-I accounts for 17% of the variance and represents the crescendo during all melodic gestures. PC-II accounts for 13% and shows a consistent differentiation of melody and accompaniment. PC-III accounts for 13% and characterizes a relative lack of differentiation between melody and accompaniment throughout. PC-IV accounts for 20% and demonstrates the pattern of a soft beginning in bar 1 and a clear distinction between melody and accompaniment in the following bars. PC-V accounts for 14% and is characterized by a strong initial upbeat, a deemphasis of bar 2, a high dynamic level in bar 3 and 4 with little differentiation of melody and accompaniment. Overall, most performances have modest loadings on two or more of the PCs.

The intercorrelations among all performance were computed. Few artists showed exceptionally high correlations between his/her two dynamic profiles. Sociocultural

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factors, such as gender, nationality, birthday, recording date, and age at the time of recording, were also studied.

In conclusion, the author claims that the study was the first one to investigate the individual differences in expressive dynamics in a large sample base. The central norm is identified by the grand average profile. Dynamic strategies present less constraint by the musical structure than timing strategies, while the performers blend different strategies into novel combinations, which results in the change of dynamic profiles. Moreover, the result also shows the independence of timing and dynamics in the selected music excerpt, which increases the performer's degrees of freedom. The author finally claims that music must always have some expressive dynamics, as well as some expressive timing.