

TEMPO CHANGE AND INTERPRETATION PREFERENCE

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ABSTRACT

In almost all interpretation of music there is tempo variation. These tempo variations are an important aspect to bring the music come to life. Are these tempo nuances depending on the basic tempo? If tempo of a performance is changed, will such a manipulated performance sound “wrong”? This test was made to see how manipulated performances were assessed compared to the originals.

10 professional musicians participated. They heard five pieces of classical music on CD (piano and orchestral), each in six interpretations. Half of these interpretations were manipulated in tempo by computer, the tempo manipulations being either 20% faster or 20% slower than the original. All tempos were within the tempo range normally heard in performances. The participants were asked to decide which performances were manipulated, to describe the performances (optional), to rate each performance (1-10) and finally rank each of the six performances of each piece.

The identifying of the manipulated versions, were not much better than random guessing (60% correct). However, in ranking and rating, the original interpretations in most cases scored better than the manipulated versions.

The results are somewhat contradictive. On one hand the identification of manipulated performances showed a low level of accuracy. On the other hand, most of the performances ranked on top were original performances, and average ranking and rating was in general better for originals than for the manipulated versions. In 14 of the interpretations where both the original and a manipulated version was included, 11 of the originals were regarded best, only three of the manipulations scored better than the original.

1. INTRODUCTION

Most music can be successfully performed in a quite wide range of tempi. Some music (i.e. pop and dance music) normally has a narrow range of “acceptable” tempos, whereas other (i.e. classical music) can be heard in a wide range of tempos¹. Is the

interpretation of a piece of music different when played in a slow tempo and in a fast tempo? Is there a correct tempo for a specific interpretation of a piece, or to put it the other way around: will a chosen tempo for a piece require a specific interpretation, and will the interpretation change if the tempo is changed?

There seem to be differences in the interpretation depending on the tempo. This has been observed and commented, but so far, to

¹ In an examination of recordings and editor’s tempo indications for Bach’s ‘Wohltemperierte I’ Wapnick 1..found that in 15 of the 48 pieces, the fastest tempos were more than the double of the slowest, and the largest difference found for one piece was from MM40 to MM132

my knowledge, it has only sparingly been tested in experiments. Peter Desain and Henkjan Honing [2] described what happens when musicians play the same piece of music in different tempi, and how wrong it goes (in their opinion) when a performance is literally shifted by electronic devices from one tempo to another without at the same time changing the interpretation. They found that the tempo curve was flatter (the tempo less varied) at tempo MM90 than at tempo MM60. Repp has contradicted this in a listening test [3], finding little or no differences between real interpretations and interpretations where tempo has been changed. He is careful though, not to be too obstinate, claiming that “interpretation usually influences tempo, but tempo does not necessarily influence interpretation”.

Are these differences in tempo variations noticeable to listeners? Would an electronic tempo-transposition from one tempo to another, maintaining the tempo variations of the previous tempo sound ‘wrong’?

2. THE EXPERIMENT

The aim of the experiment reported here was to see if it would be possible to distinguish between original performances and performances where the tempo had been manipulated. Will a performance transformed into a new tempo really sound wrong?

Five pieces of music were used, and each presented in six different versions. Two to four of these versions were real performances taken directly from CDs or discs, the rest (2-4 performances) were manipulated in tempo.² All manipulations were either 20% faster or 20% slower than originally performed. None of the manipulated tempi were faster or slower than those found in real performances. These versions, real and manipulated, were presented to listeners, 10 professional musicians and music teachers at a university level. They were asked to:

- a) Say which of the performances were real and which were manipulated in tempo
- b) Describe the performance by ticking relevant given adjectives, there was also room for short free comments
- c) Evaluate each performance by
 1. Indicating if they Found the tempo to be or meaningless fast/slow
 2. Rate each performance at a scale from 1 (poorest) to 10 (best).
 3. Rank the six performances of each piece from 1 (best) to 6.

² The intention of saying that 2-4 of the six performances would be manipulated was to reduce the chance for guessing, since the number of transformations was unknown.

CD	Music	Eks	Artist	Label	Year	Orig/Man	Tpo MM
1.1	Prokofiev: Dance with Lilies (Romeo and Juliet)	1	Abbado/ LSO	Decca SXL6286	1967	orig	81
1.2		2	Jansons/ Oslo 80%			80%	85
1.3		3	Jourdan 80%			80%	86
1.4		4	Abbado/ 120%			120%	97
1.5		5	Jansons/ Oslo	EMI CDC7492892	1989	orig ig	107
1.6		6	Jourdan/ Suiss Romande	Erato 229245817-2	1992	orig	110
1.7	J. S. Bach Italian Conserto 1.mvt 1.part	1	Angela Hewitt 80%			80%	86
1.8		2	Jørg Demus	Eurodisc 88285 XAK	?	orig	90
1.9		3	Kjetil Haugsand	Simax PSC 1032	1987	orig	97
1.10		4	Angela Hewitt	Hyperion CDA67361	2000	orig	110
1.11		5	Jørg Demus 120%			120%	112
1.12		6	Haugsand 120%			120%	120
1.13	Chopin: Nocturne gm Op 37 nr.1	1	Claudio Arrau	Phil 9500668	1978	orig	52
1.14		2	Melvyn Tan 80%			80%	65
1.15		3	Vladimir Ashkenazy	Decca	1986	orig	66
1.16		4	Arrau 120%			120%	64
1.17		5	Ashkenazy 120%			120%	78
1.18		6	Melvyn Tan	BBC Music	1999	orig	82
2.1	Schubert: Symphony nr. 8 B min 1. mvt eksp	1	Goodman 80%			80%	90
2.2		2	Carl Böhm Berlin PO	DGG 2561	?	orig	93
2.3		3	W. Swallish Dresden	Phil 422977-2	1967	orig	106
2.4		4	Josef Krips NDR	SMS 2341A	?	orig	110
2.5		5	Roy Goodman Hannover	Nimbus	1990	orig	112
2.6		6	Böhm 120%			120%	113
2.7	Grieg: Butterfly (Lyric Pieces Op 43 no1)	1	Geir Henning Braathen	Victoria VCD19029	1993	orig	93
2.8		2	Eva Knardahl	BIS LP 105	1977	orig	112
2.9		3	Braathen 120%			120%	115
2.10		4	Knardahl 120%			120%	135
2.11		5	Grøndahl 80%			80%	120
2.12		6	F Backer Grøndahl	Columbia/SimaxPSC1809	1937	orig	150

Table 1 List of performances and manipulations

When evaluating the performances, the listeners were explicitly asked to emphasize the temporal side of the interpretations rather than dynamics, articulation and quality of sound. For the tempo transformation a program called “Time Factory” produced by Prosoniq, or (for some of the music) the “time stretch” function in the Sound Forge program was used.

The selected music was classical pieces ranging from Bach to Prokofiev, more or less familiar to the listeners. Several periods of music history should be represented, and there should be different instruments/ensembles used. Some of the music, i.e. Grieg Butterfly, had a wide tempo fluctuation within the piece, while others like Bach and Schubert had a rather strict and stable tempo. The interpretations were selected to show a variety in tempo, some rather fast and some slow.

Each of the 10 participants got the music on their own CD together with the formula to be filled in, one sheet for each piece.

The shorter pieces were presented in their full length. Bach and Schubert were presented up to end of exposition/first part. Participants could play the music over and over as many times as they wanted to compare the 6 interpretations of each piece. The order of the performances on the CD was arranged with the slowest first, and then increasing tempo (the order given in table 1).

A total of 30 music excerpts were presented, six interpretations for each of the five pieces. 16 of these were original recordings, 14 were manipulations. Eight were speeded up and six were slowed down.

3. RESULTS

3.1. Guessing which performances were manipulated

On guessing which of the performances were manipulated a total of 60% of the given answers were correct (181 from 300). The melodies with manipulated tempo had a slightly better identification score than the originals, (64% vs. 57%). Among the manipulated, the melodies that had a tempo decrease were better identified than those with a tempo increase (69% vs. 58%). This result indicates that the manipulated examples do not stand out as easily recognisable. If the manipulated examples were easily identified, either due to sound quality or due to “wrong” interpretation, then a higher identification than 60% should be expected.

The lowest correct identification was in Prokofiev (43%), the highest in Bach (82%). This may partly be explained by the fact that in Prokofiev the three original performances were at the extreme tempo range (one in the slow end and two in the fast end), in Bach the three originals are placed in the middle tempo range. The respondents tended to tick the extreme tempos as manipulated and this may explain the low score in Prokofiev and the high in Bach.

3.2. Rating and ranking of performances

The participants were asked to rate each performance along a scale from 1 (lowest) to 10 (best) and also to rank the performances from 1 (best) to 6. The ranking should give an indication of which of the six performances of each piece was preferred. The rating should indicate a free evaluation of the quality of each performance, regardless the ranking.

3.3. Ranking

Average ranking for all originals was 3.14, for the manipulated the mean was 3.80. The best ranking of all performances was for Angela Hewitt (original) in Bach Italian Concerto with a mean rank of 1.5. (Seven of the ten persons ranked her first, 1 as second and 2 as third). All the highest ranked performances are original performances, except for one. The 80% performance of Butterfly played by Gröndahl is ranked the highest of the six Grieg performances, whereas his original, played at a fast tempo, is ranked among the lowest. For most of the melodies there was considerable agreement on the ranking. For Prokofiev, 8 persons ranked Jansons original interpretation as the best (mean rank 1.8), with Abbados original (mean rank 5.3) as the poorest. The best rankings in the other melodies were: in Chopin Ashkenazy (mean rank 1.9), in Schubert Swallish (mean rank 2.0) and as mentioned in Grieg Gröndahl 80% (mean rank 2.1).

3.4. Rating

The rating shows the same tendencies as the ranking; the top scoring interpretations are all originals, with again one exception, the Gröndahl performance where the 80% version was preferred to the original. Melvyn Tan's performance of Chopin (original tempo) has the highest rating (mean 7.0). Mean rating for originals is 5.28 whereas mean rating for the manipulations is 4.12. The top ratings are Janson's Prokofiev (7.4), Hewitt's Bach (7.9) Tan's Chopin (7.0) Swallish's Schubert (6,5) and Gröndahl's reduced tempo Grieg (7.4).

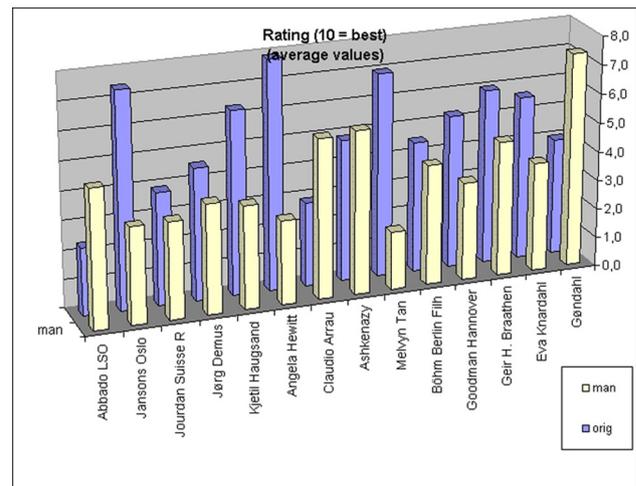


Fig 1. Rating of original performances and manipulations

The poorest ratings are Abbado's original Prokofiev (2.3) Hewitt reduced tempo Bach (2.9) Tan's reduced tempo Chopin (2.0) Goodman reduced tempo Schubert (3.4) and Knardahl up-speeded Grieg (3.8).

While Hewitt's and Tan's originals are rated at top, their manipulated versions are at the bottom. The opposite is seen in Gröndahl where the reduced version is top while the original is close to the bottom end (7.4/4.0) and Abbado where the original is the lowest of all (2.3) while the up-speeded version is close to top (no.2 with 4.8).

3.5. Preferences

In a large-scale test, Bruno Repp [4] found a tendency among listeners to prefer medium tempi, and also "traditional" interpretations rather than the extreme. Is it possible to trace the same preference for medium tempi in this test? Taking the two slowest tempi of all melodies, gives an average rating of 3.7, the two fastest interpretations of all melodies give a mean rating of 5.2 and the two medium tempos give a mean rating of 5.3, so in a totality among the 30 performances, the medium/fast interpretations are preferred to the slow ones. None of the two slowest versions of the performances were ranked as best or no. 2. Three of the highest ranked were from the middle tempo group and two from the fast tempo group.

14 of the 16 melodies were presented both in original version and manipulated. The ranking / rating between the same performances in original and manipulated versions shows an overall preference for the originals. The ranking of these pairs shows that in 11 of these 14 cases, the original versions were ranked higher than the manipulated. Of the 14 manipulated interpretations, six were slowed down and eight were speeded up. Speeded up melodies got a better average score than those with reduced tempo. In rating (with 10 max) the tempo increased got 4,54 and the tempo reductions 3,69 (originals 5,28).

4. DISCUSSION

The low rate of detecting which of the performances was manipulated (only 60%) indicates that it is difficult to hear which is manipulated and which is original. From this one might come to the conclusion that a tempo change of 20% has such a small effect (if any) on the temporal interpretation that it cannot be perceived.

This is contradicted by the ratings and the rankings. The fact that the originals score better than the manipulations, clearly indicates that the original performances are preferred. Only one of the highest ranked performances was manipulated (Gröndahl/Grieg). Four of the five no 2's were also originals.

Abbado's original Prokofiev was at the bottom of its group. This is clearly an exception. The lowest ranked in all other groups are manipulations. Again it might be apt to mention that all the lowest rated are at or near the extreme in tempo, and as mentioned earlier the preferred performances tend to fall in the middle/fast range of tempo.

Fourteen interpretations were used both in their original version and in manipulated version. Only four of the manipulated were rated higher than their original counterparts. Whether this evaluation is based on the interpretation as such (as one should expect) or whether other factors play a part is hard to read out from the results. One such factor, as already mentioned, could be the tendency to prefer medium tempo versions to the extreme tempi. Nine of the manipulated versions belong to what could be called "the outer end tempos" (counting the two fastest and the two slowest versions of each melody). However, eight originals are found in the same group, so this cannot explain the difference. Taking just the two most extreme tempos in each melody (one fast and one slow) we find 6 originals and 4 manipulated. Looking at the inner tempos we find 5 manipulated and 5 original tempi. These facts enfeeble the assumption that the tempos alone should explain the skewed distribution in preference for original performances. The fact that medium and fast tempos are preferred, do not explain the preference for original tempos.

5. CONCLUSION

The results from this test are to some extent contradictory. On the one hand the participants had problems in identifying which performances were originals and which were manipulated in tempo. This should indicate that a tempo change of 20% does not affect the interpretation noticeably. On the other hand the original performances were clearly preferred to the manipulated. The original tempo versions were presumably preferred because they sounded better and more natural than the manipulated. Why then were the manipulated not disclosed in the identification? Is it so, as Desain and Honing claimed, that the interpretation is different in different tempi, and that this, even not openly unveiled in identification process, nevertheless influences the evaluation of a performance? A close examination of tempo variations, expression and articulation in original and manipulated performances, and comparison between the two, might help explaining this. Such undertake is however beyond the scope of this experiment, but could be an interesting project to follow up the findings done here.

6. REFERENCES

1. Wapnick, J., *A Comparison of Tempo Selections by Professional Editors, Pianists, and Harpsichordists in Bach's Well-Tempered Clavier, Book I*, in *Applications of Research in Music Behaviour*, C.K. Madsen and C.A. Prickett, Editors. 1987, Un. of Alabama Press: Alabama. p. 190-203.
2. Desain, P. and H. Honing, *Tempo curves considered harmful*, in *Music, Mind and Machine*. 1992, Thesis Publishers: Amsterdam. p. 25-40.
3. Repp, B., *Relational invariance of expressive microstructure across global tempo changes in music performance: An exploratory study*. *Psychological Research*, 1994. **56**(4): p. 269-284.
4. Repp, B., *The Aesthetic Quality of a Quantitatively Average Music Performance: Two Preliminary Experiments*. *Music Perception*, 1997. **14** (4 Summer 1997): p. 419-444.