# RESOLVING THE HISTORICAL DOTTING DEBATE: HOW EMPIRICAL INVESTIGATIONS MAY INFORM PERFORMANCE PRACTICE

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## ABSTRACT

**Background.** The performance of dotted rhythms has received considerable scholarly attention among researchers of 18th century performance practice. There is controversy about how to interpret different descriptions found in historical treatises and instrumental tutors. The key issue is whether dotted rhythms should be played literally or with an altered dotting ratio and how this might affect musical character. In a previous study we found that the perception of dotting depended on articulation, tempo and dotting ratio. If perceived dotting was influenced by perceived musical character, in addition to physically measurable dotting ratio, then the debate may be resolved by realising that when performance practice researchers discuss dotting they really mean dotting as a kind of musical character.

**Aim.** To find out what performance parameters contribute to the perceived musical character of a baroque composition where dotted rhythms are prominent.

**Method.** Listeners rated the character of twenty recordings of Variation 7 from Bach's Goldberg Variations by using a modified version of Hevner's adjective list. The physical parameters of the performances were measured with audio analysis software and by subjective judgement. The subjective and objective measurements were then compared.

**Results.** We found that articulation, tempo and dotting influenced the perceived character of a performance with the dotting ratio being the least significant element because various ratios were found within each expressed character cluster. On the other hand staccato articulation and faster tempo tended to create a 'happy' mood, while legato playing and slower tempo created a more 'calm' effect. That is, dotting ratio did not contribute to the character of the piece as much as tempo and articulation, contrary to assertions made by historical musicologists.

**Conclusions.** It is more fruitful to discuss the performance of dotted rhythms from the perspective of desired musical character (as many historical sources do) and to emphasise the interaction of several performance features than to debate whether altering the dotting ratio is appropriate or not (as 20th century researchers tend to do). Consistent with our previous research, dotting ratio does not seem to necessarily correspond to dotting perception. The present study strengthens this view because dotting ratio is supposed to affect musical character, but in practice it may be one of the weakest contributors.

## 1. BACKGROUND

The performance of dotted rhythms has received considerable scholarly attention among researchers of 18th century performance practice (Fuller 1977, Donington 1989, Hefling 1993, Neumann 1993). The controversy is based on different interpretations of descriptions found in historical treatises, manuscript scores and instrumental tutors. The question at the heart of the debate is whether dotted rhythms should be played literally or with an altered dotting ratio and how this might affect musical character. Typically, both early sources and 20th century discussions of the issue justify their claims for various possible deliveries in terms of generating different emotions. For instance, the most frequently cited historical authorities on rhythmic alteration refer to the need to make the expression either 'bolder' and 'livelier' or 'flattering' and 'pleasing', or to avoid being 'too sleepy' (in Hefling 1993: 84-88, 101-105). Türk's 1789 treatise distinguishes three types of performance of dotted rhythms (Figure 1) and claims that the first (a) is used 'when the character of the composition is earnest, solemn or exalted', the second (b) when the expression is 'more lively, joyous', and the third (c) when the piece is to be 'rendered vehemently, defiantly' [or] when it is 'labeled *staccato*' (cited by Hefling 1993: 123). However, notations as in Figure 1 were not commonly used until about Türk's time. Instead, dotted rhythms were mostly notated uniformly (eg.  ) whilst the performer was expected to choose an appropriate delivery according to the assumed compositional character and in line with the verbal descriptions of possible executions. It is no great surprise, then, that when 20th century researchers of historical performance practice examined the surviving evidence of non-literal execution of dotted rhythms they found a bewilderingly opaque situation where the often conflicting statements were open to contrasting interpretations.

Generally speaking, most modern researchers tend to focus on the dotting ratio (i.e. the relative length of the dotted note and its shortened pair) because of the preponderance of remarks in the early sources regarding the desired additional lengthening or holding of the dotted note. Articulation might also get a mention, especially in terms of whether or not a short rest should be inserted between the two notes. However, tempo is almost never considered although early sources often differentiate possible executions in relation to speed. Instead of emphasizing the importance of projecting a musical character by manipulating the performance of dotted patterns, modern writers focus on particular musical genres, such as the French Overture and argue about the acceptable alteration of the dotting ratio in that particular genre.

ISBN 3-931852-67-9
ISSN 1617-6847

In a previous study we found that the *perception* of dotting did not exclusively depend on the dotting ratio but on combinations of articulation, tempo and dotting ratio (Schubert & Fabian 2001). This indicated that perceived dottedness was probably affected by the overall character of a performance, leading to our hypothesis: If perceived dotting was influenced by perceived musical character, in addition to physically measurable dotting ratio, then the debate may be resolved by realising that when performance practice researchers discuss dotting they really mean dotting as a kind of musical character.

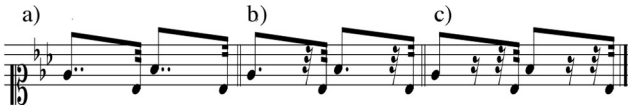


**Figure 1:** Performance of dotted rhythms as discussed by Türk 1789 (cited by Hefling 1993: 121)

## 2. AIM

To find out what performance parameters contribute to the perceived musical character of a baroque composition where dotted rhythms are prominent.

## 3. METHOD

We prepared a pilot study where two expert listeners rated the character of twenty recordings of Variation 7 from Bach's *Goldberg Variations* by using a modified version of Hevner's adjective list (Schubert, in press) (see Appendix 1 for list of recordings used). The physical parameters of the performances were measured with audio analysis software and by subjective judgement. The subjective and objective measurements were then compared. On the basis of this pilot study we reran the experiment with 90 music student participants. In this paper we report only the preliminary results of the pilot study.

## 4. RESULTS

We prepared a descriptive analysis of the data and found that articulation, tempo and dotting influenced the perceived character of a performance with the *dotting ratio* being the *least significant* element (see Appendix 2).

The majority of performances fell into clusters A, B, C, D and G, indicating a range of musical characters from *happy* (A) and *playful* (B) through *calm* (C) and *dreamy* (D) to *majestic* (G) (see Schubert, in press for more details about the clusters). The dotted quaver (dotted eighth) dotting ratio for cluster A ranged from 0.73 of a crotchet (quarter note) (by Koopman) to 0.85 (by Leonhardt in 1965 and Tureck in 1998). The range of dotting ratios for all other clusters was from 0.68 (Gould 1981) to 0.89 (Kirkpatrick 1958). Articulation seems critical in the production of clusters A, C and D. The data suggest that staccato playing is typical in cluster A performances (e.g. Tureck 1988). At the same time, legato articulation is strongly associated with clusters C and D (e.g. Kirkpatrick 1958), although C and D are likely to be further distinguished through changes in loudness: D is played even softer than C. After articulation, tempo appears to be the next most important factor, with cluster A performances being played relatively faster than those in clusters C, D and G.

In sum, then, staccato articulation and faster tempo tended to create a 'happy' mood, whereas legato playing coupled with slower tempo created a more 'calm' effect. At the same time, various dotting ratios were found within each expressed character cluster. This indicates the relative insignificance of dotting ratio in defining the overall musical character. In other words, dotting ratio does not contribute to the character of the piece as much as tempo and articulation, contrary to assertions made by historical musicologists.

## 5. CONCLUSIONS

It is more fruitful to discuss the performance of dotted rhythms from the perspective of desired musical character (as many historical sources do) and to emphasize the interaction of several performance features than to limit the debate to the alteration of the dotting ratio alone (as 20th century researchers tended to do). Although the study identified a variety of musical characters, the tenet implied by modern researchers that changing dotting ratio might be the reason for these differences could not be upheld. It seems that 'sharpening a crisp rhythm' (Donington 1989: 447) or 'pointing up such rhythms' (Mendel 1951: xv) is *not* achieved primarily by 'lengthening the value of the dotted notes' (ibid). Instead, one has to realize that the controversy underlying the dotting debate may stem from the difference between the performance and the perception of dotted patterns: we hear identical dotting ratios as being more dotted when they are faster or more staccato and thus we may falsely believe that in performance we have to prolong the value of the dotted note. Yet it is the musical character that needs to be considered which, on the basis of this study, seems to be more affected by articulation and tempo, with dynamics and dotting as secondary contributors. So it seems that when modern researchers discuss the performance of dotted patterns in particular baroque genres they are really arguing about the genre's appropriate musical character.

At the time of submitting this paper, we were validating this study by analysing multiple judgements of musical character, and preparing more refined timing and musical feature measurements. We plan to make the results of these data available soon.

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ISBN 3-931852-67-9
ISSN 1617-6847

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# APPENDIX 1

**Discography of Studied recordings of Variation 7 from Bach's *Goldberg Variations***

**1.** Demus, Jörg (Rec. 1953), NIXA WLP 5241;

**2.** Gould, Glenn (Rec. 1955), CBS 72692; R1992, Sony SMK 52685;

**3.** Gould, Glenn (Rec. 1959 Salzburg Recital), 1993, Sony SMK 52685;

**4.** Gould, Glenn (Rec. 1981), CBS DBL 37779;

**5.** Hewitt, Angela (Rec. 1999), Hyperion CDA67305;

**6.** Kirkpatrick, Ralph (Rec. 1958), DGG Archiv SAPM 198020; R1994 DG 439465 2;

**7.** Koopman, Ton (Rec. 1988), Erato 0630 14455-2;

**8.** Landowska, Wanda (Rec. 1933), EMI Reference (1987) CDH 7 61008 2;

**9.** Landowska, Wanda (Rec. 1945), HMV FALP 137; R1972, RCA VIC-1650;

**10.** Leonhardt, Gustav (Rec. 1953), NIXA PVL 7010; R1992, Bach Guild, Vanguard OVC 2004;

**11.** Leonhardt, Gustav (Rec. 1965), Teldec DAW 6.41198; R1995, Teldec DAW 4509-97994-2;

**12.** Leonhardt, Gustav (Rec. 1978), Deutshce Harmonia Mundi GD 77149;

**13.** Marlowe, Sylvia (Rec. 1962), Decca DL 710056;

**14.** Rosen, Charles (Rec. 1967), CBS 773091-3. R1992 Sony Classical Essential Classics - SBK 48173;

**15.** Suzuki, Masaaki (Rec. 1997), BIS CD-819;

**16.** Tureck, Rosalyn (Rec. 1958), HMV ALP 1548-9; R1999 Philips 456 979-2.

**17.** Tureck, Rosalyn (Rec. 1978), CBS 79220;

**18.** Tureck, Rosalyn (Rec. 1988), VAI Audio VAIA 1029;

**19.** Tureck, Rosalyn (Rec. 1998), DG 459 599-2;

**20.** Walcha, Helmuth (Rec. 1953), WRC926092.

# APPENDIX 2

**The character and performance features of 20 recordings of Variation 7.**

Performance details shown in Appendix 1. Cluster refers to character cluster – see text for examples. Means are shown for each cluster where more than one entry occurs. Dotting ratio is expressed as a proportion of a crotchet (e.g. 0.81 should be read as 0.81:0.19); Strong presence of legato and staccato articulation is indicated by a '1' in the respective column. Tempo is in beats per minute, loudness is on a 5 point scale (soft = 1, loud =5).

| *Performance* | *Cluster* | *Dotting Ration* | *Legato* | *Staccato* | *Tempo* | *Loudness* |
|---|---|---|---|---|---|---|
| Hewitt 1999 | A | 0.81 | 1 | 1 | 67.4 | 3 |
| Koopman 1988 | A | 0.73 | 0 | 1 | 77.8 | 3.5 |
| Landowska 1945 | A | 0.79 | 1 | 1 | 68.8 | 4.5 |
| Leonhardt 1965 | A | 0.85 | 0 | 1 | 66.4 | 3.5 |
| Leonhardt 1978 | A | 0.84 | 0 | 1 | 65.8 | 4.5 |
| Tureck 1988 | A | 0.83 | 0 | 1 | 64.6 | 2.5 |
| Tureck 1998 | A | 0.85 | 0 | 1 | 59.9 | 3.5 |
| **Mean ± 1 SD [n=7]** | **A** | **0.81 ± 0.04** | **29%** | **100%** | **67.2 ± 5** | **3.57 ± 0.68** |
| Demus 1953 | B | 0.82 | 0 | 1 | 63.8 | 1.5 |
| Gould 1955 | B | 0.74 | 1 | 1 | 62.2 | 2.5 |
| Landowska 1933 | B | 0.78 | 1 | 0 | 71.4 | 3.25 |
| Tureck 1958 | B | 0.86 | 0 | 1 | 61.6 | 3.25 |
| **Mean ± 1 SD [n=4]** | **B** | **0.8 ± 0.05** | **50%** | **75%** | **64.8 ± 3.9** | **2.63 ± 0.72** |
| Kirkpatrick 1958 | C | 0.89 | 1 | 0 | 52.1 | 3 |
| Marlowe 1962 | C | 0.82 | 1 | 0 | 53.2 | 3 |
| Rosen 1967 | C | 0.84 | 1 | 0 | 63.4 | 3.5 |
| **Mean ± 1 SD [n=3]** | **C** | **0.85 ± 0.03** | **100%** | **0%** | **56.2 ± 5.1** | **3.14 ± 0.24** |
| Gould 1959 | D | 0.81 | 1 | 0 | 53.3 | 1.75 |
| Gould 1981 | D | 0.68 | 1 | 1 | 55.1 | 1.5 |
| **Mean ± 1 SD [n=2]** | **D** | **0.75 ± 0.07** | **100%** | **50%** | **54.2 ± 0.9** | **1.63 ± 0.13** |
| Leonhardt 1953 | G | 0.83 | 1 | 0 | 61.1 | 4 |
| Tureck 1978 | G | 0.85 | 0 | 1 | 56.2 | 3.5 |
| **Mean ± 1 SD [n=2]** | **G** | **0.84 ± 0.01** | **50%** | **50%** | **58.7 ± 2.4** | **3.75 ± 0.25** |
| Suzuki 1997 | H | 0.85 | 0 | 1 | 73.3 | 4.5 |
| Walcha 1953 | I | 0.81 | 1 | 1 | 80.5 | 4.25 |

ISBN 3-931852-67-9
ISSN 1617-6847