Two gat Forms for the sit#r: A Case Study in the Rhythmic Analysis of North Indian Music

Martin Clayton


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Rhythmic analysis of two major composition types (the vilambit gat and madhya lay gat) as played by the Maihar gharānā sitārist Deepak Choudhury, illuminates several difficult issues. In particular this analysis clarifies the relationship between these gats and between their performance practices, and the relationships of both to their supposed models in vocal forms. This study suggests wide-ranging applications for rhythmic analysis, in studies of the relationships between the various forms and styles of North Indian classical music, and of the techniques and processes employed in performance. While dependent on an understanding of the rhythmic principles of the music tradition, such studies can go beyond areas traditionally considered to be the domain of rhythm.

I INTRODUCTION

All music is and must be organized in time, and yet despite this self-evident fact, musicology (ethno- or not) has rarely concentrated on music’s temporal processes. The study of time, as the essential element within which all music is created and perceived, has largely been neglected. There have been, of course, a few exceptions: Sachs’ *Rhythm and tempo* (1953) remains a classic, and in recent years writers in various fields have begun to develop valuable analytical frameworks for the study of musical time. The work of Lerdahl and Jackendoff (1983) on the metric structure of Western tonal music is particularly valuable in this respect. This area has remained largely ignored in Indian musicology however, and excepting the work of Widdess (1981a,b) and Rowell,¹ there has been little research into the rhythmic structure of Indian music, despite several substantial studies on the repertoire of the *tablā.*²

¹See Rowell (1992) and a number of his other papers listed in the bibliography of that work.
Rhythmic analysis, in the sense in which I use the term here, is the study of how music works—how it is structured, organized and generated in time. It is the study of some of the most fundamental aspects of music, and tells us not only about the music itself but also about the culture which produces it, about the importance of universal and culturally specific factors in its organization, and ultimately perhaps about how it may be used to represent our knowledge of the world. If we can begin to understand the processes by which music is conceived, performed, perceived and understood temporally, this must add greatly to our understanding of music both as an autonomous art form and as a product of culture in a wider sense.

This paper will introduce a few of the principles and analytical techniques developed in the course of research into the rhythmic organization of North Indian classical music, and concentrates on their application to a particular case study. This study demonstrates the potential of rhythmic analysis in studies of areas such as performance process and formal structure, and the historical development of and the relationships between different forms and styles (especially those between vocal and instrumental music). After a brief introduction to the rhythmic concepts and terminology of North Indian music, the case study itself will be outlined.

**North Indian rhythmic concepts: an introduction**

North Indian (or Hindustānī) classical music may be either unmetered (as in the introductory ālāp), or else organized by the highly developed metrical system known as tāl. The term tāl refers both to the system in general, and to any of the cyclically repeating patterns belonging to that system. Tāls are usually conceptualized as a combination of a tēkā (basic drum pattern) and a clap pattern—a recurring sequence of tālis (claps) and khālis (waves) used to aid time-keeping.

The first, and structurally most important, beat of a tāl cycle is called sam. The basic time unit is the mātra; the most common tāl cycles comprise between 6 and 16 mātrās. The cycle (āvart) is subdivided into groups of several mātrās, termed vibhāg (section), each of which is marked by either a tāli or a khāli gesture. Each tāl structure therefore determines the relationships between three levels of pulsation, or three units of time, from the mātra (the smallest) through the vibhāg to the cycle or āvart (the largest).

Tempo, in both its senses as the rate of pulsation, and the rate of rhythmic events, is regulated by the concept of lay. These qualities are described below as ‘(metric) tempo’ and ‘rhythmic density’ respectively, since the term lay itself may refer to either, or even to the relationship between the two. In most genres of Hindustānī music, metric tempo and/or rhythmic density accelerate substantially

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4Unmetered music is described as anibaddh (lit.: unbound), metered as nibaddh (lit.: bound).

5Although the former sense is that usually intended by the term ‘tempo’, a number of musicologists prefer the latter usage, largely because it provides a more objective measure for comparative studies (see e.g. Kolinski 1959).
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over the course of a performance (deceleration, where it occurs, does so only at a local level and is usually reversed). In several styles of Hindustānī music the relationship between rhythmic density and metric tempo—described here as the 'lay ratio'—is consciously manipulated as an aspect both of rhythmic variation and of the process of acceleration. Rhythmic variation, especially but not exclusively that involving manipulation of this kind, is termed *laykārī.*

Although all metrically bound music in the Hindustānī tradition is organized by the same system, *tāl,* the ways in which it is organized are surprisingly diverse; it is fair to say that the apparent homogeneity of the system conceals much of this diversity from the casual observer. Both the historical reasons for this fact, and its implications, are too complex to discuss here in any detail, although it must be borne in mind that the detailed findings of this case study cannot be assumed to apply to the tradition as a whole, or to any other particular part of it. In some respects, the rhythmic concepts discussed here are specific to the particular musical lineage or *gharānā* in question, perhaps even personal to the one musician considered. However, what can be stated with confidence is that the same analytical methods could be usefully applied to much if not all Indian music, and probably (with appropriate modifications) to other music traditions as well.

II THE CASE STUDY

This study will concentrate on two important types of instrumental composition or *gat,* as performed by an eminent sitārist. The artist in question is Deepak Choudhury (hereafter referred to as ‘DC’), a senior disciple of Pandit Ravi Shankar and hence a representative of the Maihar *gharānā,* and this author’s teacher since 1985.

The compositional forms under scrutiny are the *madhya lay gat* and the *vilambit gat.* In DC’s repertoire *madhya lay* (‘medium tempo’) *gats* are set in irregular *tāls,* with structures which may be described as ‘additive’. They are performed immediately after a full *ālāp-jor,* the unmetered and unaccompanied introduction to the *rīg.* Vilambit (‘slow’) *gats* are set in the quadratic *tīntāl,* and performed without an extended *ālāp.* The performer’s view, as expressed to the author, is essentially that the reasoning behind the performance of these two *gat* forms in the repertoire of Maihar *gharānā* artists, is that a complete concert performance should ideally comprise items derived from all three major *gāyakis* or vocal styles, namely *dhruPAD,* *khyāl* and *thumrī.* Each of the *gats* under consideration is supposedly modelled on, or at least analogous to, important stages in vocal performances in the genres *dhruPAD* and *khyāl.*

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6The suffix *kārī* denotes “performance of an act or a doer”; see Chaturvedi and Tiwari (1986:132).
7For more background information on Maihar *gharānā sitār* style, see Slawek (1987).
8Sachs distinguished rhythm in which time is divided into unequal parts, which he called ‘additive’ (or ‘quantitative’), from ‘divisive’ rhythm in which time is divided into equal parts (also called ‘qualitative’) (1953:24-6, 93).
This three-part principle was established by Ustad Allauddin Khan (d. 1972), the founder of the Maihar gharâna, who built on earlier instrumental gat forms in so doing. The vilambit gat was developed using an extant form, the masitkhâni gat, which was based on a fixed stroke pattern in tîntal (see below). The masitkhâni gat was originally (from the 18th or early 19th century) performed at a moderate tempo; it was subsequently slowed down, and elements of khyâl gâyaki incorporated, the result being known as the vilambit (slow) gat.9 The type of madhya lay gat described here was created more recently, probably within this century; the inspiration for this was the perceived need to create a medium tempo form to complement the alâp-jor, thus completing the ‘dhrupad âng’ (dhrupad component).

Consequently the first segment of a sitâr recital by DC, should consist of alâp, jor and a medium tempo composition (the madhya lay gat). This sequence is derived from the vocal genre dhrupad-dhamâr,10 in which the major râg development precedes the introduction of tâl. The second item comprises a combination of slow and fast tempo compositions, analogous to the baRâ- and chotâ khyâl, in which the main râg development takes place within the context of the slow tempo tâl; finally a lighter item (dhun) is performed, usually based on folk melodies and preferably incorporating some influence from thumri gâyaki.11

DC refers to these three stages as the dhrupad âng, khyâl âng and thumri âng respectively; âng means ‘part’, literally ‘limb’, hence ‘component of repertory’.12 The madhya lay gat belongs to the dhrupad âng and is held to be analogous to the dhrupad (or dhamâr) composition, while the vilambit gat belongs to the khyâl âng and is similarly comparable to the baRâ (‘great’, i.e. slow) khyâl. These relationships are set out in figure 1.

The clearest connection between the respective instrumental and vocal forms is that described above, and illustrated in figure 1; DC’s dhrupad âng and khyâl âng imitate the large-scale organization of recitals in their respective ‘parent’ genres.13 Thus the vocal models provide a rationale for the arrangement of different elements in DC’s recitals, suggesting the appropriate performance order for the various instrumental forms.

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9According to Slawek, Ravi Shankar credits this development to both Allauddin Khan and the sitârist Rameshwar Pathak (1987:19). A similar development took place at roughly the same time (probably within the first half of this century) in the Imdadkhâni sitâr gharâna (see Hamilton 1989: e.g. 74, 175).

10Dhamâr is a vocal form related to dhrupad, and also sung by dhrupad singers; hence the compounded term sometimes employed for the genre, ‘dhrupad-dhamâr’.


12These terms are also mentioned by Slawek (1987:20).

13Although in practice a variety of sequences may be used, for khyâl recitals in particular, the best known archetype is arguably the one given in fig. 1. Like DC’s khyâl âng, many khyâl performances begin with a brief alâp (similar in style to that of dhrupad, but shorter and less thorough).
Fig. 1  The division of DC’s sitar repertoire into three ângs

<table>
<thead>
<tr>
<th>âng</th>
<th>instrumental forms</th>
<th>vocal ‘models’</th>
</tr>
</thead>
<tbody>
<tr>
<td>dhrupad âng</td>
<td>a. extended âlāp-jor</td>
<td>dhrupad-style âlāp</td>
</tr>
<tr>
<td></td>
<td>b. madhya lay gat (medium tempo composition)</td>
<td>dhrupad, dhamār</td>
</tr>
<tr>
<td></td>
<td>c. (optional drut gat,14 fast tempo composition)</td>
<td>(optional fast dhrupad)</td>
</tr>
<tr>
<td>khyāl âng</td>
<td>a. brief âlāp (optional)</td>
<td>khyāl-style âlāp (optional)</td>
</tr>
<tr>
<td></td>
<td>b. vilambit gat (slow tempo composition)</td>
<td>barā khyāl (slow tempo khyāl)</td>
</tr>
<tr>
<td></td>
<td>c. drut gat (fast tempo composition)</td>
<td>chōtā khyāl (fast tempo khyāl)</td>
</tr>
<tr>
<td>thumri âng</td>
<td>a. dhun</td>
<td>stylized folk tune; some thumri influence</td>
</tr>
<tr>
<td></td>
<td>b. (optional drut gat)15</td>
<td></td>
</tr>
</tbody>
</table>

If the performer’s view is confirmed by analysis, one would expect to find a clear distinction between the performance style of the madhya lay and vilambit gats, and indications that the differences are not derived simply from the different tempi, but determined in some way by analogies with dhrupad and barā khyāl. One would expect to observe distinctions in one or more of the following areas: the use of particular tāls; the rhythmic structure of the gats; the techniques used in the improvised development; the ranges and patterns of change of both tempo and rhythmic density; and the style of drum accompaniment. The approach of the study described here was to look at each of these areas in turn. The intention was to develop rhythmic profiles of each gat type, incorporating the most important rhythmic parameters, and then to compare these profiles, both with each other, and with those of vocal genres.

The analytical techniques employed in this study combined appraisal of the sitar performance—on the basis of a knowledge of Maihar gharānā technique and style, and wherever possible in terms of categories found within the music culture itself—with an objective and scientific analytical approach. The principal methods employed were therefore:

a) Analysis of the tāl structure, taking into account both thekā and clap pattern (see below).

14 Although many dhrupad performances also feature a fast tempo composition (usually in the 10-mātrā sūtāl, or the 7-mātrā tivrā tāl), the drut gats performed here are very similar in performance style to those in both the khyāl and thumri âṅgs.

15 See above, n.14.
b) Determination of the rhythmic structure of the gat, based on reconstructed bol (stroke) patterns, and its relationship to tāl structure.

c) Analysis of the rhythmic structure of improvised passages (again, by means of reference to bol patterns), and correlation of these structures with those of the gat and/or of the tāl itself. This included recognition of idiomatic rhythmic techniques, such as various types of tīhās (triple repetitions), and analysis of their application, as well as consideration of the preferred rhythmic style. Rhythmic style is characterized in terms of two archetypes; these are named ‘syllabic’ (in which a clear relationship exists between notes and bols, and between both and the tāl structure), and ‘melismatic’ (in which this relationship is broken down due to the use of extended melisma, i.e. more than one note is sung or played for each text syllable or stroke).

d) Measurement of lay; in both its aspects as metric tempo and rhythmic density, with consideration for the relationship between the two. Lay charts were used to clarify patterns of acceleration, and these were correlated with formal schemes of the performances studied, to illustrate the relationship between changes in tempo and those in technique.

e) Analysis of the style of percussion accompaniment.

A study was carried out on a representative selection of 6 madhya lay gat and 5 vilambit lay performances by DC, comprising both concert and commercial recordings (detailed in the discography). This study concentrated on each of the areas listed above in turn, and also correlated the different parameters in order to build up a clear picture of rhythmic styles.

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16 Bolks are (potentially) spoken syllables, which in this context represent the strokes played on the sitār. There is clearly a powerful relationship between the prominence of such representation, and the traditional preference for syllabic organization and style in Indian music.

17 An important distinction may be made in Indian classical music between these two rhythmic styles. The former, ‘syllabic’ style is typical of South Indian music and of the older North Indian vocal styles such as dhrupad, while the latter, ‘melismatic’ style is associated with more recently developed vocal genres such as the baṛā khyāl. This issue is discussed in more detail in my thesis (1993:45ff). See the similar use of these terms independently arrived at and applied to Beijing Opera by Wichmann (1991:265).

18 Lay measurements were made with a timer application, ‘HyperTimer’, developed by the author using the HyperCard programme on an Apple Macintosh computer; data was processed using a spreadsheet application (Excel), which also generated the lay charts below (figs. 8 to 11).
III RESULTS

The results of these investigations are many and complex; those relevant to the questions under consideration are summarized below in six sections (tāl structure; gat structure; development procedures; lay; accompaniment style; and the correlation of rhythmic parameters), together with observations on their significance.19

I Tāl structure

There is a clear distinction between the types of tāl employed in the two gat types. In madhya lay gats, DC uses a variety of tāls which are composed of vibhāgs of different lengths (e.g. 2+3+2+3 or 4+4+3). The most important of these, according to DC himself, are the six shown in figure 2.20

In contrast, all vilambit gats are set in tīntāl, in which all sections are the same length (4+4+4+4) (fig. 3).

Thus we may observe distinctions here between many tāls (in the madhya lay gat) and one tāl (in the vilambit gat), and between additive and largely asymmetrical structures on the one hand, and a divisive and symmetrical pattern on the other. The six main tāls used in DC’s madhya lay gat appear to have been selected to fulfil a requirement for rhythmic complexity and diversity; there is also a significant preference for a final vibhāg of 3 mātrās. Neither of these factors applies to the vilambit gat, which is always set in tīntāl.

The selection of tāls does not however present a clear picture of influence from vocal genres. The greater emphasis on rhythm in DC’s madhya lay gat is clearly evident in the greater variety and complexity of the tāls used, and this reflects a greater emphasis on rhythm in dhrupad than in khyāl (although, in the case of the vocal genres this emphasis is not similarly reflected in a greater variety of tāls used for dhrupad). Of DC’s madhya lay gat tāls jhaptāl, dhamār tāl, occasionally matta tāl and even rūpak tāl may be used for dhrupad, and the two savāri tāls for the associated genre of solo pakhavaj (barrel drum) performance: however, the main dhrupad tāl, the 12-mātrā cautāl, is conspicuous by its absence from this list. On the other hand although tīntāl is employed for khyāls, so too are other tāls (e.g. jhūmrā tāl, ektāl) which are not used for vilambit gats. Moreover, clear distinctions between the types of tāl structures employed, such as those noted above, are not observed between dhrupad and khyāl. Overall therefore, evidence for the influence of vocal genres on instrumental forms in tāl use is limited.

19More detailed discussion, including transcribed music examples, is to be found in my thesis (1993:179ff).

20DC also occasionally performs madhya lay gats in a tāl of 13 mātrās (jay tāl), and in ½-mātrā tāls (e.g. 9½, split 4+4+1½).
Fig. 2 Tāls used in DC's 'dhrupad ang’ madhya lay gat.  

**jhaptāl:** 10 mātrās, 2+3+2+3

<table>
<thead>
<tr>
<th>X(1)</th>
<th>dhin nā</th>
<th>dhin dhin nā</th>
<th>tin nā</th>
<th>dhin dhin nā</th>
<th>X</th>
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<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
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<td></td>
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<td>10</td>
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</tbody>
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**rūpak tāl:** 7 mātrās, 3+2+2

<table>
<thead>
<tr>
<th>X(0)</th>
<th>tin tā tirakita</th>
<th>dhin nā</th>
<th>dhin nā</th>
<th>tin</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
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**matta tāl**: 9 mātrās, 4+2+3

<table>
<thead>
<tr>
<th>X(1)</th>
<th>dhin tirakita dhin nā</th>
<th>tū nā</th>
<th>dhindhin nā, dhin dhinnā</th>
<th>dhin</th>
</tr>
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<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>6</td>
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<tr>
<td></td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>1</td>
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**cārtāl ki savārī (savārī tāl):** 11 mātrās, 4+4+3

<table>
<thead>
<tr>
<th>X(1)</th>
<th>dhī tirakita dhin nā</th>
<th>tū nā kat tā</th>
<th>dhidhi nā, dhī dhinā</th>
<th>dhī</th>
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<td>1</td>
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<td>11</td>
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**pañcam savārī tāl:** 15 mātrās, 4+4+4+3

<table>
<thead>
<tr>
<th>X(1)</th>
<th>dhin tirakita dhin nā</th>
<th>tū nā kat tā</th>
<th>tārakita dhinnā tūnā kattā</th>
<th>dhindhin nā, dhin dhinnā</th>
<th>dhin</th>
</tr>
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<td>12</td>
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<tr>
<td></td>
<td>13</td>
<td>14</td>
<td>15</td>
<td>1</td>
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</tbody>
</table>

**dhamār tāl:** 14 mātrās, 5+5+4

<table>
<thead>
<tr>
<th>X(1)</th>
<th>ka dhī ta dhī ta</th>
<th>dhā — ge ti ṭā</th>
<th>ti ṭā tā —</th>
<th>ka</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>X</td>
<td></td>
</tr>
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<tr>
<td></td>
<td>12</td>
<td>13</td>
<td>14</td>
<td>1</td>
</tr>
</tbody>
</table>

21In each tāl the top line illustrates the clap pattern, the bottom line the tablā thekā. Top line symbols used are 'X' for sam (1st mātrā), numerals for tālis (claps), and 0 for khāli (wave); vertical lines separate vibhāgs (sections). The repetition of X (sam) indicates the repeating nature of the pattern. On the bottom line, syllables represent tablā bols (mnemonic syllables); each mātrā is either filled with one stroke, or divided equally between a number of syllables grouped together in the notation. The sign — indicates a rest (absence of drum stroke), and the comma indicates a stress on the stroke following, where this stroke occurs in mid-mātrā; i.e. dhin = ṭ, tirakita = ṭṭṭṭ, — = ṭ, dhindhin nā, dhin dhin nā = ṭṭṭṭṭ.  

*The thekās given here for matta, savārī and pañcam savārī tāls are from tablā player Arup Chattopadhyay (pers. comm.). The bols ‘dhi’ and ‘dhin’ are equivalent; I have reproduced them here as they were recited to me.
In both *gat* types, the fixed compositions appear to be based on idiomatic *sitār* patterns; however they are organized according to slightly different rhythmic principles. *Vilambit gats* are almost invariably based on modified versions of the *masītkhānī gat* form (fig. 4); the *masītkhānī gat* has a stereotypical *bol* pattern, which features a 5-ṃatā *mukhrā* (anacrusis) leading up to *sam* (the first beat), and hence overlaps the *tāl* structure. This pattern was apparently created by the *sitārist* Masit Khan in the 18th century, and therefore predates the influence of *bara khyāl* on instrumental *gats*, which took place largely in the 20th century.

Most of DC’s *madhya lay gats* are based on the *tāl* structure itself, employing relatively simple *bol* patterns and with no overlap or syncopation across the *vibhāg* divisions (although with a preference for hemiola in the final *vibhāg* of 3 ṃatās). DC has however developed a new type of *gat* in recent years which incorporates a 2½-ṃatā *mukhrā*; thus apparently transferring a feature of the *vilambit gat* to the *madhya lay gat*. Examples of these *gat* structures, in *jhaptāl*, are given in figure 5.

All the *gat* types illustrated in figures 4 and 5 are clearly idiomatic instrumental forms; in the absence of text syllables, it is the patterns of strokes (*bols*) which form the basis of their rhythmic organization. The basic pattern of the *vilambit gat* has been retained over some two centuries, and the decrease in performance tempo over this period has been compensated for by an elaboration of the basic pattern, which is particularly prominent in the *mukhrā* (see figure 4b). Patterns for *madhya lay gats* are of more recent origin, and are clearly based in the first instance on the structure of the *tāls*. These have tended to crystallize into archetypal patterns, such as those cited above (figure 5).

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23Indeed the *masītkhānī gat* dates from a period before the fashion for very slow *khyāl* performance had been established. There may have been a connection between *khyāl* and the *masītkhānī gat* at this stage (see Slawek 1987:17), but it is not directly relevant to this discussion.

24Except in some *gats* in *rūpak tāl*; see Clayton (1993:201)
Fig. 4 Examples of bol sequences for simple and elaborated masïtkhâni gats

(a) masïtkhâni gat—the basic pattern

\[ \begin{array}{cccc}
\text{X} & \text{2} & \text{0} \\
\text{j} & \text{j} & \text{j} & \text{j} & \text{j} & \text{j} & \text{j} & \text{j} & \text{j} & \text{j} & \text{j} & \text{j} & \text{j} \\
/ / \text{diri} & \text{da} & \text{diri} & \text{da} & \text{ra} & \text{da} & \text{da} & \text{ra} & \text{da} & \text{ra} & \text{da} & \text{ra} & \text{da} & \text{ra} // \\
\end{array} \]

(b) masïtkhâni gat—an example of an elaborated pattern by DC

\[ \begin{array}{cccc}
\text{X} & \text{2} & \text{0} \\
\text{j} & \text{j} & \text{j} & \text{j} & \text{j} & \text{j} & \text{j} & \text{j} & \text{j} & \text{j} & \text{j} & \text{j} \\
/ / \text{diri} & \text{da} & \text{diri} & \text{da} & \text{diri} & \text{da} & \text{ra} & \text{da} & \text{ra} & \text{da} & \text{ra} & \text{da} & \text{ra} & \text{da} & \text{diri} // \\
\end{array} \]

Fig. 5 Two bol patterns for sitâr gats in jhaptâl (10 mâtrâs); symbols as fig. 4

(a) madhya lay gat—a typical pattern, sam-to-sam

\[ \begin{array}{cccc}
\text{X} & \text{3} & \text{0} \\
\text{j} & \text{j} & \text{j} & \text{j} & \text{j} & \text{j} & \text{j} & \text{j} & \text{j} & \text{j} & \text{j} & \text{j} \\
/ / \text{da} & \text{diri} & \text{da} & \text{ra} & \text{da} & \text{diri} & \text{da} & \text{ra} & \text{da} & \text{ra} & \text{da} & \text{diri} & \text{da} \\
\end{array} \]

(b) madhya lay gat—a mukhrâ type pattern

\[ \begin{array}{cccc}
\text{X} & \text{3} & \text{0} \\
\text{j} & \text{j} & \text{j} & \text{j} & \text{j} & \text{j} & \text{j} & \text{j} & \text{j} & \text{j} & \text{j} & \text{j} & \text{j} \\
/ / \text{-da} & \text{ra}, \text{da} & \text{-ra} & \text{da} & \text{diri} & \text{da} & \text{ra} & \text{da} & \text{da} & \text{ra} & \text{da} & \text{ra} & \text{da} & \text{diri} & \text{da} // \\
\end{array} \]

If the influence of vocal genres were to be felt, certain features of the ‘dhrupad anâg’ gats might be expected to provide a connection with the typical dhrupad practice, of setting cautâl compositions with a textual/melodic grouping of 3+3+3+3 against a tal structure of 4+4+2+2 (see Widdess 1981a:137). This is not the case: evidently, the influence of dhrupad does not extend into this type of contra-metrical composition structure—indeed, DC does not use cautâl at all for madhya lay gats. In bara khyâl compositions, the most prominent aspect of the rhythmic structure is the mukhrâ, which is a feature also observed in the vilambit gat. However, since almost all fast tempo khyâls, and many dhrupads and thumris, also feature mukhrâs, we must be careful not to read too much into this feature. The use of the mukhrâ

---

25 da = inward stroke, ra = outward stroke, diri = da+ra, in the time previously occupied by a single stroke. The mukhrâ is italicized; the signs //.....// denote the beginning and end of the sequence (ie. repeat marks).

26 This example is transcribed from a vilambit gat by DC in râg jaunpurî (see Clayton 1993:227); there are many other possibilities.
does not necessarily imply the influence of \textit{barā khyāl}, especially as the \textit{masītkhāni gat} pattern appears to predate that influence.27

The structures of the \textit{gats} themselves confirm their histories: the \textit{vilambit gat} developed through adaptation of an earlier form, while the \textit{madhya lay gat} was composed relatively recently on the basis of the \textit{tāl} structure, and is at an earlier stage in its development. Once again therefore, evidence for the influence of vocal genres is less than overwhelming, although the analysis has been productive in other ways.

3 Development procedures

In both \textit{gat} types, a rough distinction may be drawn between development techniques and procedures that are suited to a low rhythmic density and immediately follow the statement of the \textit{gat sthāyī} (first section of the gat), and those that are suited to higher rhythmic densities and are therefore employed towards the end of the performance—although in practice no clear division is made. Since in the \textit{khyāl aṅg, rāg} development occurs within the metered form, the melismatic \textit{vistār} (the ‘spreading out’ of the \textit{rāg})28 has an important place in the early stages of DC’s \textit{vilambit gat} development. At a comparable stage in the \textit{madhyā lay gat}, the technique employed by DC, loosely termed ‘\textit{tōdā},’ involves the generation of new rhythmic and melodic combinations based on material already introduced.29 The \textit{vilambit gat vistār} is comparable to the \textit{vistār} in some styles of \textit{barā khyāl}; the \textit{tōdā} of medium tempo compositions is, arguably, similarly analogous to the \textit{bol bāt} (‘text division’) procedures typical of \textit{dhūrand} performance.

At a later stage and at faster tempi, however, \textit{ekhārā} \textit{tāns} (fast runs with one note per stroke) are performed in both \textit{gats}. In \textit{vilambit gats} the normal ‘\textit{lay} ratio’ (maximum rhythmic density + metric tempo) for \textit{tāns} is 8:1, with occasional bursts of up to 12:1.30 In \textit{madhyā lay gats} the normal \textit{lay} ratio for \textit{tāns} is 4:1, with some extra-fast passages of 6:1 or even 8:1. This reflects the preference for fast \textit{tāns} in \textit{sitār} performances of all \textit{gat} types; in vocal music they occur principally in \textit{khyāl}.

27 Another difference between \textit{barā khyāl} and the \textit{vilambit gat} is in the adjustment of the \textit{mukhrā} to slow tempi; in \textit{barā khyāl} as a general rule, the slower the tempo the fewer \textit{mātras} the \textit{mukhrā} takes up—in this way the variability of both the rhythmic pattern and density are limited. In the \textit{vilambit gat} the \textit{mukhrā} always takes up 5 \textit{mātras}; the slower the tempo, the more elaborated the pattern becomes.

28 \textit{Vistār} is used in both a general sense, meaning ‘expansion’ or ‘development’ and—as here—in a more specific sense to refer to \textit{rāg} exposition in melismatic style. Some musicians prefer the term \textit{barhat} (lit.: increase, expansion) in both these senses, or either \textit{ālāp} or \textit{ālap} in the latter, more limited sense only.

29 \textit{Tōdā}, like \textit{vistār}, has a range of senses. Specifically it refers to development based on stereotypical \textit{bol} patterns which combine single and double strokes; more generally to any development in a syllabic style (as here). In DC’s \textit{madhyā lay gat}, \textit{tōdā} refers to the generation of new rhythmic combinations, using melodic material already introduced in the foregoing \textit{ālāp}. There is a considerable degree of overlap between the usage of the terms \textit{tōdā}, \textit{vistār} and \textit{barhat}.

30 I.e. a maximum of 8 or 12 \textit{bol} per \textit{mātra}. I have avoided introducing terminology for these \textit{lay} ratios here for the sake of brevity; see my thesis (1993:147-9), or Gottlieb (1977:42-5, or 1993:37-41).
The transition from *vistār* or *toda* through to *tāns* is smoothly effected in both cases, by means of a progression through various intermediate *lay* ratios—this progression is a notable feature of Maihar *gharānā* style. In *vilambit gats* the progression from the point at which this ratio becomes clear (as it is not in the early stages of *vistār*) may be $4:1-5:1-6:1-(7:1)-8:1$; in *madhya lay gats* it would be $2:1-3:1-(7:2)-4:1$ (against a metric tempo twice as high as that of the *vilambit gat*). In both cases these levels are used in a more systematic way than in either *khyāl* or *dhrupad* performance, and in fact such use is largely the result of influence from solo percussion repertoires and from South Indian music (on Ravi Shankar in particular). The process of stepwise acceleration is an important feature of DC’s performance style, usually described as an aspect of *laykārī*.

Other aspects of development technique may be considered, in addition to the preference for *toda* (emphasis on rhythm and stroke patterns, syllabic in style) or *vistār* (emphasis on melody and fluid continuity, melismatic in style), or the common use of *tāns* and of South Indian-influenced ‘*laykārī*’ (stepwise acceleration). In any *gat* form, following the initial statement of the *gat* itself (usually in fact following the *sthāyi* or first section only), the improvised development is organized into ‘episodes’ separated by refrains consisting of repeated statements of the first line of the *gat* *sthāyi*. The way in which development processes are integrated with this episodic performance structure is clearly important.

Episodes of development may start from any point and in many different ways; a pattern is more discernible in the way in which improvised episodes end, and link back to the *gat* refrain. In all cases this transition from improvisation episode to fixed refrain is effected as smoothly as possible. In the *vilambit gat*, both *vistār* and *tāns* link back either to the *sam* or to the start of the *mukhārā*. In a large proportion of cases this link involves a *tihār* (a phrase repeated three times), calculated to end on *sam* or before the *mukhārā*, or to elide with the start of the *mukhārā*. *Tihās* are also common in the *madhya lay gat*. In the case of simple *gats* which run *sam*-to-*sam* (see fig. 5a), they generally end on *sam* itself; where the *gat* includes a *mukhār* (see fig. 5b) they more often conclude just before the *mukhār* begins.

The use of potentially complex rhythmic techniques such as *tihās* may suggest *dhrupad* influence, since there is generally more emphasis on rhythmic virtuosity in *dhrupad* than in *khyāl* performance. However a comparison with *dhrupad* performance reveals that, as with the technique of stepwise acceleration (‘*laykārī*’), the *tihār* is employed far more in both *gat* styles than it is in *dhrupad*. This suggests that the main inspiration for this high usage of *tihās* in *sitār gats* also lies elsewhere.

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31 *Lay* ratios in parentheses are optional.
32 South Indian terms for changes in subdivision of the *tāl* pulse (ie. *lay* ratio) include *gati* (*bheda*) and *nadai* (*svara*). See Sambamoorthy (1964:100), Shankar (1974:90 or Frishman (1985:2).
33 Or in some circumstances the first line of the final section, the *antarā*.
34 *Tablā* player Bikram Ghosh describes this style of improvisation—ending just before the *mukhār* begins—as the ‘*muqām*’ style (pers. comm.). *Muqām* means literally ‘halting place’ (Chaturvedi and Tiwari 1983:606).
The most probable sources are the repertoires of the drums pakhāvaj and tablā, of the kathak dance and even possibly of South Indian music; in all these cases tihāis are used extensively. Therefore, study of development procedures in these two types of gat provides evidence for the influence of the vocal models (in the distinction between techniques and styles of toḍā and vistār); for mutual influence (in the use of tāns, a khyāl feature, in the madhya lay gat); and for influence from other sources (the use of laykārī, and of tihāīs). Although the evidence for the modelling on vocal forms is modest, the analysis highlights a number of other interesting issues.

4 Lay

Analysis of lay includes measurement of tempo (and recognition of patterns of variation), calculation of rhythmic density, and recognition of the relationship between the two. Firstly, tempo ranges of madhya lay gats are considerably higher than those of vilambit gats, with maxima approximately double, as figure 6 shows. This evidence serves to confirm the information given in the names of the gat types—the vilambit gat is slow, the madhya lay gat performed at medium tempo. Measurements for rhythmic density are perhaps more interesting however. In the early stages of the improvised development (immediately following the statement of the gat sthāyi), a calculation based on the number of bols (strokes) in each cycle reveals that the average bol density is much lower in vilambit than in madhya lay gats (in fact, it is approximately half). This confirms that the rhythmic style of the former is more melismatic, as described above: one would expect that a more melismatic style would use fewer strokes per minute, and this is precisely what the figures show.

Fig. 6  Tempo ranges for vilambit and madhya lay gats, as performed by DC

<table>
<thead>
<tr>
<th>composition type</th>
<th>range of tempo (MM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>vilambit gat</td>
<td>32-92</td>
</tr>
<tr>
<td>madhya lay gat</td>
<td>85-180</td>
</tr>
</tbody>
</table>

35In South Indian music they are known as mora.
36I.e. number of bols in cycle + length of cycle (in secs) x 60 = average bol density.
37The ranges given are from the lowest initial tempo to the highest final tempo.
38Based on a sample of 5 performances; see discography.
39Based on a sample of 6 performances; see discography.
By the second half of the performance however, rhythmic density levels are almost identical. The reason for this is that while the technique and rhythmic style of the performance are quite different in the early stages of the development, in the latter stages they are basically the same; fast tâns are performed. Figures taken from one example of each gat type are given in figure 7.

**Fig. 7 Lay measurements for two gat performances by DC**

<table>
<thead>
<tr>
<th></th>
<th>rāg Bhaṭiyār</th>
<th>rāg Pūriyā</th>
<th>vilambit gat tīntāl</th>
<th>madhya lay gat jhaptāl</th>
</tr>
</thead>
<tbody>
<tr>
<td>tempo:</td>
<td>43-82 MM</td>
<td>89-160 MM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>average rhythmic density (initial development):</td>
<td>67-90 bols/min</td>
<td>110-185 bols/min</td>
<td></td>
<td></td>
</tr>
<tr>
<td>maximum rhythmic density (tāns):</td>
<td>290-656 bols/min</td>
<td>294-640 bols/min</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This pattern is not found in the vocal genres, since tâns are exclusive to khyāl. In the later stages of a performance, rhythmic densities are higher in most khyāl performances than in dhrupad, whereas they are very similar in the two gat forms.

Acceleration patterns for the two gat types are remarkably similar; in the earlier part of the performance rhythmic density increases over a more or less constant tempo, in the later the tempo increases by a number of significant, and clearly deliberate, increments. Patterns of tempo change are illustrated in figures 8 and 9 with respect to two typical performances, one for each gat type. The patterns for vilambit and madhya lay gats are very similar to each other; they are derived from neither dhrupad nor khyāl, although they are certainly more similar to those of khyāl performances. Analysis of sample performances suggests that tempo in dhrupad performances does generally accelerate significantly, although never by clear and deliberate increments (the acceleration is a gradual and possibly unconscious process). Khyāl performances often retain very steady metric tempi for long periods, but do often include stepped increases in tempo as well. This indicator gives useful corroborating evidence of the similarities in performance practice between the two gat types. Overall the results of the analysis of lay corroborate the earlier findings—that is, that while there are some indications of the influence of vocal forms, a number of other factors are equally important.

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40 At this stage maximum rhythmic densities were calculated by multiplying the metric tempo by the lay ratio (e.g. if tāns were performed with a lay ratio of 8:1 at a tempo of 60MM, the maximum rhythmic density would be calculated as 60x8 = 480 bols/min).

41 See Clayton 1993:97ff.
**Fig. 8** Lay (metric tempo) chart for a vilambit gat performance of rāg Bhaṭiyār in tīntāl, by DC

![Tempo Chart](image)

**Fig. 9** Lay (metric tempo) chart for a madhya lay gat performance of rāg Pūriyā in jhaptāl, by DC

![Tempo Chart](image)

### 5 Accompaniment style

The style of tabla accompaniment is almost identical in DC’s madhya lay and vilambit gats. The tabla plays the thekā in an elaborated form throughout, except when playing solos to the accompaniment of the gat sthāyī played as a refrain. This accompaniment style is similar to that of khyāl, in which the thekā is used for a very high proportion of the performance, but with a greater allowance for tabla solos. The only concession to dhruPAD style accompaniment (as played on the pakhāvaj) is in a brief episode of sāth saṅgat (‘synchronized accompaniment’⁴³) with which

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⁴²NB: the greater fluctuation in this chart (compared to fig. 8) is caused by the greater sampling rate, since the error in timings is proportionally higher for the shorter and faster tāl cycles of the madhya lay gat.

⁴³Also referred to as larant (‘fighting’) accompaniment. See Kippen 1988:102.
DC's madhya lay gat performances are usually concluded. This is a feature included no doubt as the result of a conscious attempt to imitate dhrupad practice.44

6 Correlation of rhythmic parameters

So far this discussion has focussed on five distinct areas; tāl use and structure; gat structure; development technique and style; lay (tempo and rhythmic density) and the style of percussion accompaniment. Although it is convenient and effective to divide the analysis according to rhythmic parameters in this way, it must be emphasized that all these factors must necessarily be interdependent; each is dependent on the others, and a change in one would have inevitable knock-on effects.

Connections between the parameters are many. The simplest way for some of these to be illustrated is graphically, as in figures 10 and 11. Using tempo charts as the base line, a second trace has been added, using the calculations of rhythmic density described above. Aligned with these charts are lines illustrating the alternation of gat, improvised development and refrain in the sitār part, the stage of performance and techniques employed including tihāṣ, and the lay ratio. In this way, both the overall progression and acceleration process, and the episodic performance structure are made clear; so too are changes in technique and laykāri correlated with the measured changes in lay. Two charts are given here, one from a madhya lay gat (fig. 10) and the other a vilambit gat (fig. 11).

These charts not only allow different rhythmic parameters to be correlated, they also graphically illustrate the similarities and differences between performance styles. Not only are patterns of tempo and rhythmic density increase rather similar (except that the rhythmic density in the vilambit gat starts lower, yet reaches the same maximum); so too is the episodic structure of the performance, in which tabla solos intersperse development episodes.45 In both cases the sthāyi only is stated at the beginning, and the antara introduced after two episodes of development. Both performances start with one or two strokes per mātra (a similar lay ratio), and both end with very similar rhythmic densities (but with different lay ratios). Both feature at least two significant accelerations by the soloist (and the vilambit gat performance has several others due to the tabla player accelerating for his solo interludes). Both also last approximately the same time, although this is slightly misleading since vilambit gat performances tend on the whole to be longer.

The differences are the more melismatic style of the vilambit gat (illustrated here through the lower rhythmic densities in the early part of the performance), and the greater number of lay ratios employed there (due to the need to shift from a lower rhythmic density than the madhya lay gat to the same maximum). Surprisingly, given the otherwise greater emphasis on rhythm in the madhya lay gat, of these two examples the vilambit gat actually employs more tihāṣ than the madhya lay gat. One

44 Some musicians believe that the selection of tabla bols in madhya lay gat accompaniment is, or should be, limited to those derived from the pakhāvaj, but this lies beyond the scope of this paper.
45This episodic structure is also described, in slightly different terms, by Wade (1984:41).
possible explanation for this is that the cycle of jhaptāl in the latter performance is
so short (c. 4–6.5 sec.) that tihās must either be very short, or they must cover
more than one cycle, as does the ending nauhār tihāi. In the cycle of vilambit tintāl
(12–22 sec.) on the other hand, there is enough time for a substantial tihāi leading to
either the mukhrā or sam, and this partly explains the high number counted.
Therefore the comparison between the charts points to considerable similarity
between the performance styles, besides confirming the significant difference in
approach at the early stages of the development.

A number of features are illustrated clearly in both charts. These include the
association of the first significant increase in tempo with the switch to tāns (in the
case of the vilambit gat in figure 11, the acceleration actually follows the first burst
of 8:1 tāns), the use of a stepwise increase in lay ratio to raise the rhythmic density
to a suitable level for fast tāns, and the episodic structure common to both
performances. Useful as these charts are however, they cannot illustrate all the
important rhythmic parameters, nor can they illustrate connections with vocal
genres. In order to compare a wider range of rhythmic parameters—not only madhya lay versus vilambit gat, but also each of these versus its vocal ‘model’, the
most important parameters are set out in figure 12.

In this chart the comparison may be made between the four columns, and it is
clear that in several respects the gat forms do appear to correlate with their vocal
‘models’ (see rows 2,3,5,14 and possibly 10,15 and 16). However, in other cases
the gats compare more closely with each other (see rows 7,8,12,13 and possibly
15), or demonstrate the influence of some other source (such as South Indian
music), or in some cases present a situation too complicated to be summarized
simply (rows 4,11). In this way the search for correlations with vocal music not
only provides evidence of exactly that, but also of mutual influence between the gat
forms, of the independent development of instrumental music, and of the influence
from other sources on both gats.

IV CONCLUSIONS

The aim of the rhythmic analysis summarized above was to look for evidence to
support the view that these two gat forms were in some sense modelled on two
analogous vocal forms. Differences in performance practice were recognized and
analysed, with a view to determining whether they may be associated with the
influence of vocal genres (and not simply due to, say, the differences in
performance tempo). Evidence to support DC’s contention on vocal influence
included the difference in metric tempo, the presence of melismatic vistār in the
vilambit gat and the relatively syllabic style of the madhya lay gat, and the bol
density calculations which confirm the more melismatic style of the slow gat. The
use of the mukhrā in the vilambit gat, and the limited use of sāth saṅgat in the
madhya lay gat accompaniment, may also be cited as possible evidence for the
influence of vocal genres. However, the areas in which the vocal genres most
clearly exert influence are in the large scale organization (particularly in the fact that,
as in khyāl, rāg development in the khyāl aṅg is concentrated in the metered
section); and in a greater emphasis on rhythm in the dhrupad aṅg (although in several respects its realization is different from that in dhrupad).

**Fig. 10** A correlation of rhythmic features of a performance of a madhya lay gat in rāg Pūriyā by DC, in jhaptāl\(^{46}\)

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\(^{46}\)The nauhār tihāī is a variety in which each phrase (ie. each third) of the tihāī itself consists of a shorter tihāī. The nauhār therefore concludes on the ninth repetition (nau = nine). This is closely related to another variety called the cakkardār (lit.: with a spin, spiral), in which each phrase of the tihāī consists of a short phrase plus a tihāī.
**Fig. 11** A correlation of rhythmic features of a performance of a vilambit gat in rāg Bhaṭiyār by DC, in tītāl

<table>
<thead>
<tr>
<th>Performance scheme</th>
<th>gat</th>
<th>t</th>
<th>t</th>
<th>t</th>
<th>t</th>
<th>t</th>
<th>t</th>
<th>t</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>e1</td>
<td>e2</td>
<td>e3</td>
<td>e4</td>
<td>e5</td>
<td>e6</td>
<td>e7</td>
<td>e8</td>
<td>e9</td>
</tr>
<tr>
<td></td>
<td>e10</td>
<td>e11</td>
<td>e12</td>
<td></td>
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<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Stage of performance</th>
<th>sth.</th>
<th>ant.</th>
<th>vis.</th>
<th>vis.</th>
<th>layk.</th>
<th>tān</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tīhāśi</th>
<th>t</th>
<th>t</th>
<th>t</th>
<th>t</th>
<th>t</th>
<th>t</th>
<th>t</th>
<th>t</th>
<th>t</th>
<th>n</th>
<th>n</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Lay ratio (x:1)</th>
<th>1-2</th>
<th>(2-3)</th>
<th>2</th>
<th>(3-4)</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Tempo (MM)</th>
<th>$\ell = 47$</th>
<th>59-64</th>
<th>73-79</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Lay (MM)</th>
<th>(Average)</th>
<th>(Maximum)</th>
</tr>
</thead>
</table>

- $\square$ = gat
- $\square = t$ = tablā solo
- $\square = \ell$ = tabla solo ant.
- e1, etc = dev't episodes
- $\ell = $ tīhāśi
- $\ell = $ tūbhāri
- $\ell = $ nādhāri tīhāśi
- n = nādhāri tīhāśi

Rhythmic density

Tempo

Cycle

Time (16'30")
Fig. 12  A comparison of rhythmic parameters between dhrupad, bařā khyāl, and DC’s madhya lay gat and vilambit gat

<table>
<thead>
<tr>
<th></th>
<th>dhrupad (dhamār)</th>
<th>madhya lay gat (dhrupad aṅg)</th>
<th>vilambit gat (khyāl aṅg)</th>
<th>bařā khyāl</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 vocal influence</td>
<td>n/a</td>
<td>said to be analogous to dhrupad</td>
<td>said to be analogous to bařā khyāl</td>
<td>n/a</td>
</tr>
<tr>
<td>3 performance context</td>
<td>follows full ālāp sometimes precedes fast dhrupad</td>
<td>follows full ālāp-jor sometimes precedes drut gat</td>
<td>follows aochār (brief ālāp); precedes drut gat</td>
<td>begins recital or follows brief ālāp preceded choṭā khyāl</td>
</tr>
<tr>
<td>4 principal tāls</td>
<td>cautāl (4422), jhapāl (2323), dhāmār tāl (554)</td>
<td>jhapāl (2323), rūpak tāl (322), cāntāl ki savārī (443), pakhām savārī tāl (4443), mata tāl (423), dhāmār tāl (554)</td>
<td>tintāl (4444)</td>
<td>ektāl (4422), jhūmrā tāl (3434), tīntāl/tīvādā tāl (4444)</td>
</tr>
<tr>
<td>5 lay (tempo)²</td>
<td>47-128 MM</td>
<td>85-180 MM</td>
<td>32-92 MM</td>
<td>10.7-60 MM</td>
</tr>
<tr>
<td>6 lay (average rhythmic density)²</td>
<td>n/a</td>
<td>110-185 bols/min</td>
<td>67-90 bols/min</td>
<td>n/a</td>
</tr>
<tr>
<td>7 lay (maximum rhythmic density)</td>
<td>up to 256 bols/min</td>
<td>294-640 bols/min</td>
<td>290-656 bols/min</td>
<td>up to 378 bols/min</td>
</tr>
<tr>
<td>8 lay (acceleration pattern)</td>
<td>most common: gradual acceleration. in some passages, tempo constant or with wide fluctuation.</td>
<td>starts stable, stepped acceleration around change to tān phase and one or more further increases.</td>
<td>(as madhya lay gat)</td>
<td>most common: constant, or gradual acceleration. stepped acceleration to tāns in some styles.</td>
</tr>
<tr>
<td>9 lay ratios used (those in parentheses optional)</td>
<td>most common: 2:1, (3:1), 4:1</td>
<td>2:1, 3:1, 4:1 (and 4:3, 5:2, 7:2, 6:1, 8:1 occasionally)</td>
<td>3:1, 4:1, (5:1), 6:1, (7:1), 8:1, (12:1)</td>
<td>most common: 4:1, (6:1) and 8:1 against perceived pulse (up to 32:1 against mālātā)</td>
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</tr>
<tr>
<td>10 bandiś or gat structure</td>
<td>syllabic, cover whole cycle</td>
<td>syllabic, cover whole cycle</td>
<td>syllabic, cover whole cycle (with some melisma interpolated)</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>either sam-to-sam or with mukhra. cautel bandiśes often with contra-metric setting.</td>
<td>either sam-to-sam, or with 2½ mātra mukhra. most tāl-based, some syncopated.</td>
<td>most based on modified masikhāni gat (with 5 mātra mukhra).</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>consists of bol bāt; syllabic, text-based rhythmic development.</td>
<td>starts with syllabic rhythmic development (tdā, laykārī). gat antarā follows.</td>
<td>starts with rāg development (vistār). gat antarā follows.</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>rhythmic density increases, but no tāns.</td>
<td>tāns in 4:1 in latter part of performance.</td>
<td>tāns in 8:1 in latter part of performance.</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>accompanied by combination of thekā, pakhāvaj solo, and sāth sahagat.</td>
<td>ends with episode of sāth sahagat.</td>
<td>no sāth sahagat.</td>
<td></td>
</tr>
</tbody>
</table>

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1 Figures refer to the sample of performances cited in the discography, unless otherwise stated.

2 Average and maximum rhythmic densities are taken from the two gat performances illustrated in figure 7 above; those for vocal genres are based on the performances cited in the discography.
Against this evidence, however, must be set the use of tāns in both genres (reflected in the near-identical maximum rhythmic densities), extensive use of tihās and of South Indian-influenced laykārī techniques, and a common accompaniment style. These factors, and others such as DC's recent introduction of mukhrās into his madhya lay gats, suggest both the diversity of influences brought to bear on the gat forms, and a powerful tendency to mutual influence, illustrating the difficulty for a creative artist in limiting cross-fertilization between theoretically distinct forms.

It is clearly not the case that the gats are intended as literal imitations of the vocal genres. This is inevitable, since a number of factors would render imitations of vocal forms on sitār less than satisfying. The loss of the text and its meaning might be felt to diminish the music, unless it were compensated for—as it is here by a greater rhythmic complexity in both gat forms. Moreover, and perhaps more importantly, the severe lack of sustain of the sitār relative to the voice means that this must be balanced by a higher rhythmic density; consequently, differences in rhythmic style between vocal and instrumental music are inevitable.

The development of the vilambit and madhya lay gats as part of the khyāl and dhrupad āṅgs respectively has succeeded in generating diversity and rhythmic interest in the Maihar gharānā sitār repertoire. However, each of the gat forms has continued to develop, and various forces are felt which continue to influence that development, of which three are particularly important: (1) the retention of certain elements which suggest the influence of the vocal forms (as perhaps initially envisaged); (2) the inevitable cross-fertilization of techniques and structural elements between gats; and (3) the adoption of elements from sources other than the two stated vocal genres. The later historical development of these gats may be understood to a great extent as the result of the interaction of these factors.

This study shows how investigation of the information available within the oral tradition led to a productive analysis. Although the main thrust of that tradition (at least in DC's interpretation)—that the difference in performance styles between the gats was due principally to their different origins in vocal forms—could be only partially confirmed, this undoubtedly remains an important factor. The investigation also brought to light other factors contributing to the complicated pattern of historical development of these gats, such as mutual influence between the different forms, and influence from other quarters such as the percussion repertoire and South Indian music. As had been hoped, rhythmic analysis proved to be a powerful tool in this investigation.

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