

Performance Style in Elena Gerhardt's Schubert Song Recordings

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• ABSTRACT

Performance style is conceptualised as a collection of small 'expressive gestures' consisting of changes in frequency, loudness or duration within or between notes or phrases. Collections differ somewhat between individuals (personal style) and change in content over time (period style). The changing style of Elena Gerhardt (1883-1965), as documented in her recordings of Schubert Lieder (1911-1939), is analysed through her habits of timbre, vibrato, scoops, portamento, tuning, and rubato. Beneath the general impression of consistency throughout her career, more detailed analysis of the data, especially concerning vibrato and rubato, reveals a process of gradual evolution consistent with the hypothesis that performance style changes in unrecognisably small steps which accumulate rapidly across a musical culture.

1. INTRODUCTION

The work of CHARM has focused attention on performance style, a phenomenon whose importance rests on two facts in particular. First, anything one might wish to claim that involves the sound of music at any stage in the argument—regardless of whether the argument concerns production or perception—depends on assumptions about how the music is performed, and this is true regardless of whether the performance is imagined or real. Secondly, performance changes: people do not perform scores, nor unwritten 'standards', in the same way across the generations. To the (very large) extent that music is perceptible only via performance, therefore, music changes over time. We cannot rely on scores being understood in the same way from generation to generation. This has significant implications for work on music cognition (Leech-Wilkinson, 2007). Findings made recently may not be valid a century hence, and might not have been valid for participants a century ago. Understanding performance style, and how and why it changes, is thus important for everyone who works on the perception or reception of music.

In Leech-Wilkinson (2009b) I proposed a cultural-evolutionary mechanism that may underlie performance style change, allowing unnoticeably small innovations to accumulate very rapidly, producing change that is audible from generation to generation, and large enough from century to century that musical habits become unrecognizable, leading on occasion to uncomprehending laughter from audiences confronted with an

early recording. Leech-Wilkinson (2009a) modeled performance style as a collection of expressive gestures. A gesture can be defined as an irregularity in one or more of the principal acoustic dimensions (frequency, loudness, timing), introduced in order to give emphasis to a note or chord (Leech-Wilkinson, 2009a, chapter 8). Gestures model sounds and other temporally shaped phenomena (including feelings) that we recognize from life, and in so doing attach meanings to gestures in sound, making them expressive of something (Leech-Wilkinson (2006a; 2009a, ch. 8, where some of the enormous bibliography dealing with the perception of musical meaning is referenced and discussed). Manners of making gestures in sound, and of making them expressive, change over time (and to an extent, less now than before, change from place to place). At any one place and time there is considerable agreement among performers about how to be expressive (period style), and there is a shared understanding with and among listeners as to what is 'musical' (which simply means the currently agreed period style of expressivity in performance). Within this general period style, each performer has a slightly different manner of expressivity, their personal style. But the consistency is such that a performer can generally be placed immediately into a historical context by a knowledgeable listener.

Personal and period styles, therefore, must be relatively confined subsets of a much larger range of possibilities, most of which are inconceivable at any one place and time. Readers can test this for themselves by playing Sound Example 1 and Sound Example 2, both extracts from performances of Schubert's 'An die Musik', the first recorded in 1911 by Elena Gerhardt (mezzo-soprano) and Artur Nikisch (piano),¹ the second in 1997 by Bernarda Fink and Gerold Huber. These two performances, so different in so many ways, could not have been produced in the same period context. The audience to whom one seems just right may find the other a travesty. Even to a listener experienced in many different recorded performance styles, the contrast is deeply unsettling. In short, the understanding of musical communication required to make sense of one cannot be used to make sense of the other.

There is a limit to how much we can do experimentally to explain this extraordinary situation. We have no listeners from 1911, and the experiences of listeners today can tell us little reliably about them. There is nothing we can do to clarify more than marginally how music was heard a century ago. Our best hope, in the medium term, comes from study of the interrelationship between styles of performance and other kinds of style, including styles of communication through writing, speaking and acting. Because expressive music-making is so period-bound, there must be relationships with period styles further removed from sound, including fashion, design and other visual arts (Cook forthcoming); but at the moment we seem a very long way from any detailed understanding of the links. Our first step, therefore, must be far more modest. We need a way of studying musical performance style in some detail. Once we have access to some of its component parts it may in due course become possible to see similarities (procedural or formal) with the components of other kinds of style.

There are many potential routes towards an analysis of some of the components that make up a performance style. One very promising approach has been taken by Cook

and his CHARM team working on Chopin mazurkas, using large numbers of recordings to generate data that can be searched for patterns (see Cook in this volume). My own approach within CHARM has drawn more on psychology, both in work with Renee Timmers (Timmers, 2007a, 2007b), and in using the findings of many previous studies to illuminate the processes underlying the communicative singing of Schubert songs (the fullest working-out of this approach in Leech-Wilkinson, 2009a, ch. 8). The purpose of the current article, the last under the auspices of the CHARM Schubert song project, is to examine personal style in one early recorded singer, Elena Gerhardt.² In view of everything I have said about the impossibility of understanding, this may seem paradoxical. But it is not so much understanding as simply observation and characterisation of style that I hope to provide here. One could use a modern singer for this, but there are two practical disadvantages: first, the major record companies rarely respond to requests for copyright clearance; secondly, at close distances in time performance style is much harder to recognize, because its details seem so natural that one hardly hears them as components in the construction of style. A less familiar style is much easier to break down into its constituent parts. And so it makes a good place to begin to develop appropriate analytical techniques.

Early recordings bring some complicating factors, however. Until her 1925 sessions Gerhardt was recording with the acoustic process, singing into a horn that focused sound waves onto a diaphragm that in turn caused a stylus to cut a groove in a revolving wax disc. From 1926 she was using the new electrical process involving microphones as pickups, which produced a somewhat more natural sound. But in both cases the frequency response was very poor, and a great deal of noise and other kinds of distortions were introduced into the signal. Each recording produces a slightly different sound, because the equipment either was different, was set up slightly differently, or had warmed up and settled in different ways. Together with Andrew Hallifax, the CHARM sound engineer, I have tried to allow for this as far as possible by making new transfers from original 78rpm discs. We have also tried to make them consistent, allowing for the fact that each disc requires different equalization and noise-reduction in order to get the most plausible results from the individual source discs.³ There are no rules because there is no knowledge of the setup nor access to the original equipment; one can use only the judgement of the modern ear. It is worth bearing in mind that these kinds of problems are not entirely absent from modern recordings either. Sound engineers have very personal ideas about the kind of sound they want, and the same voice or instrument may seem considerably different when recorded by a different engineer or on different equipment or in a different venue. Recordings are never transparent.

2. TIMBRE

It is necessary to be very careful, therefore, when one looks at the colour (timbre) of a recorded voice, which is the first of the stylistic features I shall discuss. Nothing very precise can be said based on a recording. Nevertheless, a number of features of Gerhardt's sound can be observed; indeed they must be since they are essential to a definition of her personal style. One might think that the voice itself (a given) would lie outside considerations of style (adopted, whether intentionally or not), but in fact the situation is

much less straightforward. The sound she makes is necessarily something developed over time using what her body seemed to afford, yet using that in the light of current norms of artistic singing. In other words, she trained her voice to work well for her contemporaries (for a theoretical model see Leech-Wilkinson, 2009a, ch. 7, fig. 16). And then like any singer, Gerhardt had to develop a way of working with the remaining peculiarities of her voice, those aspects of its sound that may have seemed less than perfect but that could not be trained or practised away. That is to say, she had to find a way of turning them to apparent artistic use. Singers are very good at this, disguising vocal problems by well-placed vocal gestures or breaths that seem to have expressive purpose.

In Gerhardt's case there are problems of register whose 'solution' forms an important aspect of her personal style. In conformity with Sundberg's analysis of vocal registers (Sundberg, 1987, p. 50f.), Gerhardt's voice falls fairly clearly into three registers: a 'chest' voice up to about d'/f, a 'middle' voice, and a 'head' voice from about e''/f#. The boundaries are fuzzy because of her (typical) ability to sing in either voice at the cross-over, but her d' is clearly in chest voice, while her head voice is sometimes avoided even as far as f#'' where the high note is climactic in the composition (e.g. 'Die Krähe', b. 32, apparently transposed down a semitone: the score here has g' (Sound Example 3).⁴ The differences in timbre are very obvious in Gerhardt's voice, so much so that leaps in a composition that jump over register boundaries produce a marked change of timbre liable to disrupt a sense of melodic continuity. How serious a problem this is depends to some extent on the vowel. Formants generating vowels may emphasise or reduce the effect of stronger upper harmonics in chest notes. So high-front vowels tend to produce harsher chest notes than low-back vowels: see for example 'Im Frühling', at 'und' (b. 12) and 'die' (b. 28: Sound Example 4.)⁵

In the third of her four recordings of 'Wohin?' from *Die schöne Müllerin* (1925), 'meinem', leaping a fourth down to bottom d' at bb. 17 and 21 (Sound Example 5) and thus crossing from middle to chest registers, produces a very marked change of timbre. For the previous b'-g' the first and fourth harmonics are strong, the third and fifth weaker; whereas at the low d' the first and second harmonics are weak, the third and fourth strong, while the fifth to eleventh are approximately equal and louder than the first and second, producing a dissonant, rasping tone. Rapid changes of register in and out of chest voice present problems for Gerhardt, as at 'es gehn' (bb. 65-6; Sound Example 6, first extract), where in the 1925 recording the brief 'es' on bottom d' is more a croak than a note. The 1927 performance is somewhat more successful in sounding the chest note, perhaps because it is slower and more cautious (Sound Example 6, second extract). Similarly, in 'Geheimen', recorded the following year, Gerhardt covers several of the leaps down into chest voice by singing the low note much more quietly. Compare the crude contrast at 'Äu-]geln' (b. 10) with the tentatively quieter effect at '[Leu-]te' (b. 15) and then the much more successfully covered leap that follows at '[dage-]gen' (b. 23). (Sound Example 7). Thereafter all the remaining leaps down into chest voice are sung quietly. Here we seem to see Gerhardt learning to work with the characteristics of her voice (at least, as it was that day) and with the deficiencies of her technique which left her so much at the mercy of melodic lines that crossed her lower break.

It may not be irrelevant that Gerhardt was plucked from studenthood at the Leipzig Conservatoire by Artur Nikisch, the director, and propelled at the age of 20 into a career as a Lieder recitalist, with Nikisch as her accompanist, when she might usefully have been continuing her training. Gerhardt's strength was her exceptional ability to communicate with her voice; but in singing emotional communication is in important respects at odds with technical perfection. Every note emphasized by a change in loudness or pitch or timing for expressive effect disrupts melodic continuity and timbral consistency, and in a period in which expressive effect is highly valued, as it was in German singing in Gerhardt's youth, the technical ability to maintain vocal consistency through expressive gesturing in sound is more important than ever. Had Nikisch been less attracted by her (and he clearly was: see Gerhardt, 1953, p. 11) we might have been listening to a better-formed voice, if indeed we had heard of her at all.

Gerhardt's vocal problems varied from day to day. It is one of the consequences of the pre-tape processes of recording that we hear (as almost never thereafter) unedited takes on disc, and using the company paper-trail (Kelly & Cosens, 1987; Kelly, 2004), which shows what was recorded in each session, it is possible to reconstruct a recording career in the studio day by day. The 9th March 1927—on which, accompanied by Conraad Bos, Gerhardt recorded several songs from *Winterreise*—was a productive day but marred by markedly differentiated chest notes. Her 'Der Leiermann', the fifth and last song recorded that day, while for the most part remarkably successful at restraining the harshness of her chest voice for the leaps down to bottom d' (the performance appears to be transposed down a tone), nevertheless fails several times to cover the leap, especially in the cruel octave jumps at the very end. Yet in songs recorded earlier in the day, when she was surely less tired, Gerhardt's ability to put her vocal condition to artistic use is fascinating. In 'Der Lindenbaum' (the first track of the day) the stormy middle section with its low c' and b ('Kopfe, ich wendete mich nicht', b. 51) sounds not just windy (which would be sufficient for a literal reading of the text) but threatening: in the context of an unsettled performance, which emphasizes the wanderer's distress more than the calm of the linden tree, these unattractive sounds work remarkably well (Sound Example 8). The immediately following contrast, 'Nun bin ich manche Stunde' (b. 58), in which Gerhardt cuts down the upper harmonics to produce a consonant, fundamental-rich sound more characteristic of head voice, again goes way beyond any suggestion in the text, but uses an ability Gerhardt has to modify her timbre for expressive effect to intensify the performance as a whole by exaggerating contrasts offered by the poem (Sound Example 9).

The same control of timbral change could be used also for formal articulation. 'Das Lied im Grünen' (recorded 24 March 1925) offers a clear example in its repeated 'im/in's Grünen', the phrase occurring eighteen times in Schubert's setting. Gerhardt colours pairs of these phrases differently at the ends of stanzas, placing the 'Grü-' and the '-nen', especially the latter, higher and more forward in the mouth the first time, at the musical climax (bb. 15-16), and lower and further back the second ('nen' becomes 'nern', bb. 16-17), as the stanza cadences at its close (Sound Example 10, which adds the parallel case from the final stanza). In other words the timbre modulation from more tense to more relaxed mouth position and vowel matches the de-intensification or unwinding of

the musical structure and its descending melodic line. A more carefully calibrated example, spread over a larger part of the song, is offered by 'Der Wegweiser' (11 March 1927). Schubert's setting states its final phrase three times, and Gerhardt darkens the vowels at each repetition, bringing a powerfully increasing sense of gloom and foreboding to the closing page of the song, 'die noch keiner ging zurück' (from which no one has yet returned). (Table 1, Sound Example 11.)⁶

<i>Text</i>	<i>Vowel quality</i> <i>bars 64–6</i>	<i>bars 74–6</i>	<i>bars 78–80</i>
	3' 08.3"–3' 08.6"	3' 41.9"–3' 42.2"	3' 54.9"–3' 56.1"
die	(er)	more forward (ü)	darker (ö)
	3' 08.6"–3' 08.9"	3' 42.3"–3' 42.5"	3' 56.7"–3' 57.5"
noch	(ah)	darker (er)	darker still (or)
	3' 10"–3' 12.7"	3' 44.1"–3' 46.5"	3' 58.5"–3' 59.6"
kei-		slightly darker	much darker
	3' 13.2"–3' 14.2"	3' 46.9"–3' 47.9"	4' 00.3"–4' 02.1"
-ner	(ah)	same (ah)	much darker (er)
	3' 14.2"–3' 15.2"	3' 47.9"–3' 49.1"	4' 02.2"–4' 03.9"
ging		same	darker
	3' 15.3"–3' 16.5"	3' 49.3"–3' 50.7"	4' 05.1"–4' 07"
zu-		darker	darker
	3' 16.5"–3' 19.5"	3' 50.6"–3' 53.3"	4' 06.7"–4' 15"
-rück		same	lighter?

Table 1: changing vowel qualities in Schubert's 'Der Wegweiser', recorded in 1927

3. VIBRATO

Another aspect of Gerhardt's personal style, formed through practice and yet so deeply ingrained as to have become fundamental to her voice, is her vibrato. Singers vary a lot in the extent to which they can modify their vibrato: some can do so in detail at will, some not at all. Gerhardt lies some way from those extremes, with a vibrato that, in so far as it is under control (not always), is relatively consistent in rate (speed) at 0.16–0.17 secs, more varied in width, with both rate and especially width able to be graduated into and out of notes for emphasis. 'Der Wegweiser' shows it in its mature form (Figure 1).

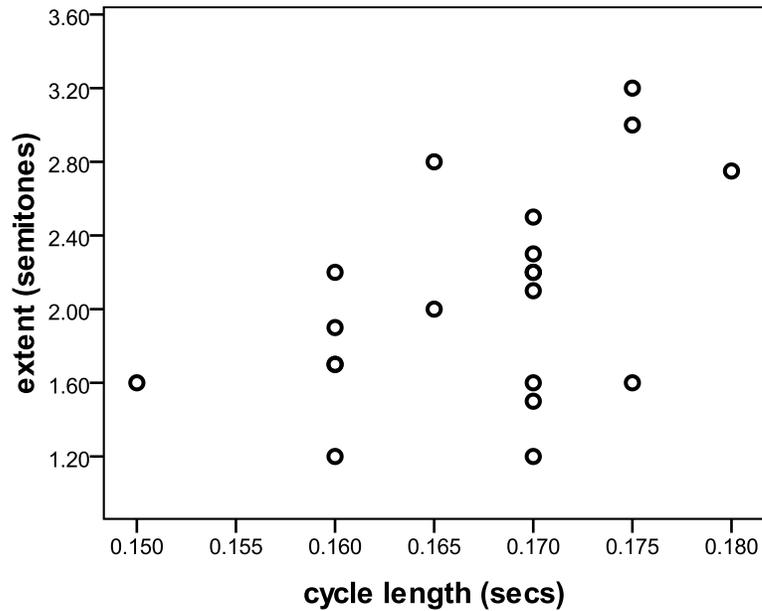


Figure 1: Gerhardt's vibrato in 'Der Wegweiser' (1927), based on a sample of longer notes for which averages can be reliably established.

It is, however, difficult to be precise because Gerhardt's vibrato generally varies in width from cycle to cycle, as her pitch shifts up and down. She has a marked tendency, not uncommon in singers, to allow the pitch to drift upwards during a note, which brings a sense of striving or yearning, and through that an intensified expressivity. When this occurs vibrato cycles inevitably get extended along the upward part of the cycle and shortened on the downward part, causing difficulties in measuring. But too much precision is of doubtful perceptual relevance, so the figures here probably suffice to indicate the typical range within which her vibrato operates at this stage in her career.

Her earliest recordings, however, show a more regular and narrower vibrato, as in 'Du bist die Ruh' (12 January 1914; Figure 2):

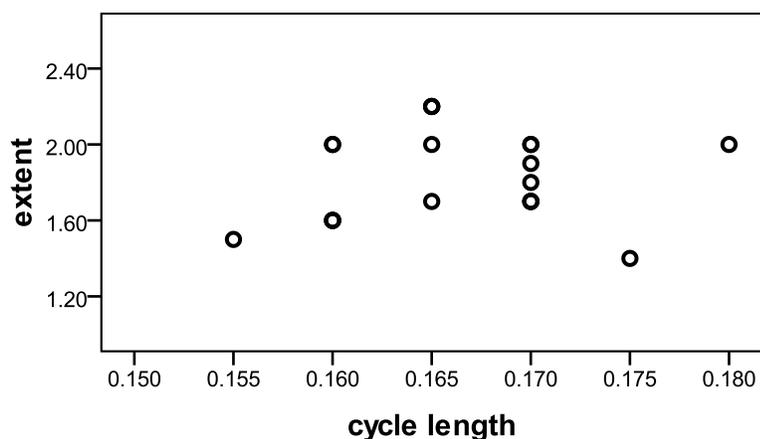


Figure 2: Gerhardt's vibrato in 'Du bist die Ruh' (1914)

By contrast, in a late recording, 'Die Stadt' (12 October 1939; Figure 3), the range is very large (Figs 1-3 are plotted on approximately the same vertical scale; their contrasting heights therefore reflect the overall range of vibrato in each). Notes with very narrow vibrato produce an appropriately eerie effect for this text, while the exceptionally wide five-semitone example included in this sample also responds to the text, setting 'Die Sonne hebt'. Most of the vibrato here is much wider than in the earlier recordings, probably reflecting the aging of Gerhardt's voice. Another feature of changed style is the relatively frequent use, now, of notes in which vibrato grows and then diminishes, clearly a characteristic of her late manner. The aging is beyond her control, of course, but otherwise what we see here is a wider variety of vibrato rates and extents being applied for expressive ends in relation to the text and score.

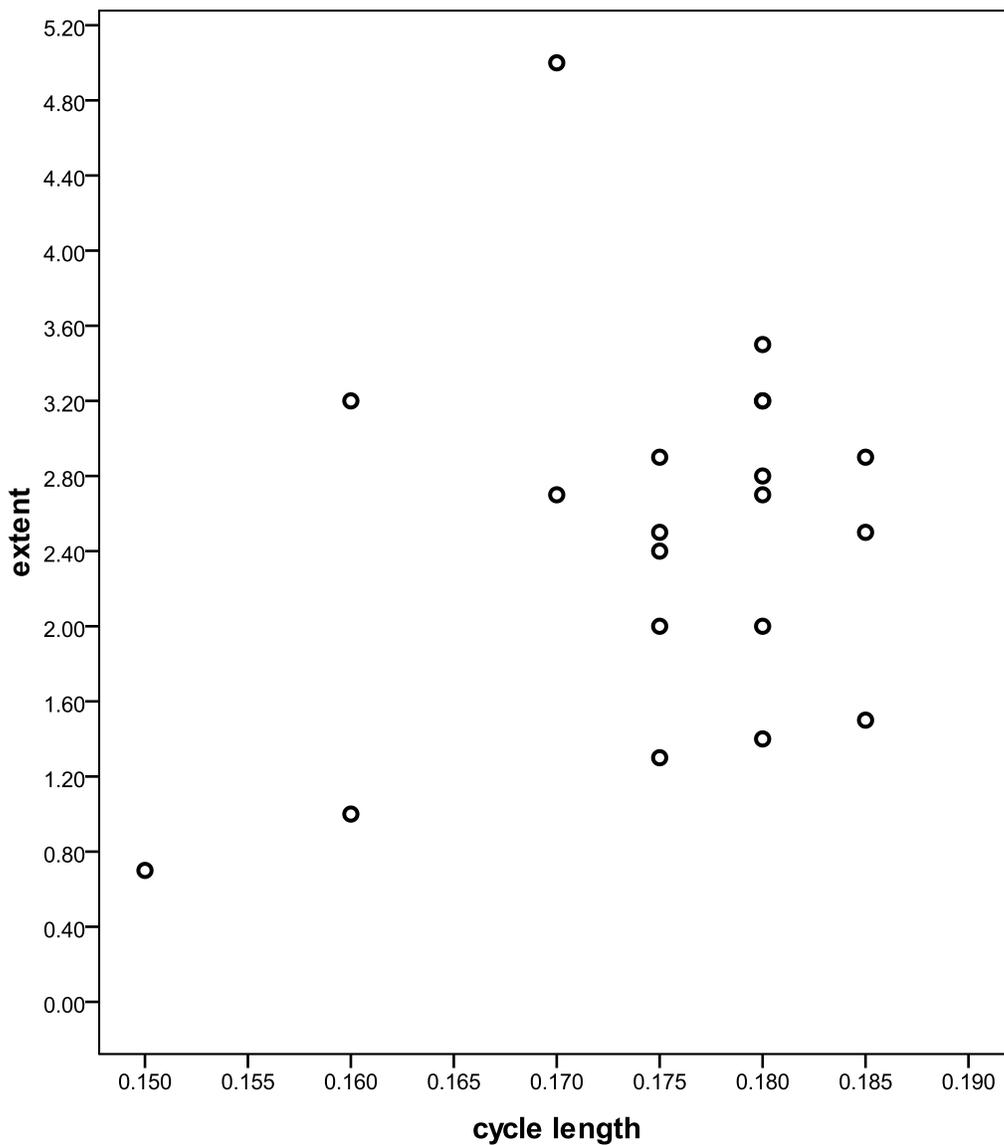


Figure 3: Gerhardt's vibrato in 'Die Stadt' (1939)

In other words, Gerhardt's use of vibrato changes, becoming a little slower but also more controlled, flexible and expressive. Something similar happens at about the same time in violin playing. Violinists born in the 1870s (Flesch, b. 1873; Kreisler, b. 1875) gradually learn to use—and players born in the 1880s (especially Hubermann, b. 1882, the year before Gerhardt) use from the start—regular vibrato which varies according to the dynamics of the compositional phrase. At the points of greatest tension in a phrase, especially at melodic climaxes, notes are louder and vibrato is deeper; at points of musical resolution, especially phrase-ends, loudness and vibrato both tail off. And this coordination of loudness and vibrato remains surprisingly constant among violinists of succeeding generations up to the present day (Leech-Wilkinson, 2009,

chapter 5). But this is not quite what we see in Gerhardt. Rather than relying on a simple coordination of loudness and vibrato extent, she seems to use both as variables that can be combined in different proportions for different effects. In this she is also an early practitioner of an approach to expressive singing that became common and has remained so among those singers able to vary vibrato for expressive purposes. Gerhardt's developing practice, therefore, relates to developing practices in other musical domains (her response to developments in period style), yet shows considerable individuality in ways that are amenable to relatively precise analysis.

The most detailed analytical work on singers' vibrato, also using recordings as sources of data, is that of Carl Seashore's group at the University of Iowa from the late 1920s and early 1930s (Seashore, 1932, 1936). Their essays remain indispensable, the findings compromised only by their not having been able to know, at that early stage in the history of recording, that vibrato changes from generation to generation. So some of the features they identified as 'The Vibrato' are not in fact immutable. Although Gerhardt's vibrato is more or less contemporary with their work, most of their recorded examples were of older singers, and so a direct application of their findings to her recordings is not appropriate. Nonetheless, it is safe to say that the aspects of vibrato they identified that are more complex than simply extent and rate apply to Gerhardt's voice just as much as to their examples. Several of Seashore's team, notably Milton Metfessel (1932) and Joseph Tiffin (1936), examined intensity vibrato, the change in the relative loudness of harmonics during the vibrato cycle which the listener perceives as a richness of timbre. In singing this is intimately bound up with vowel formants. As vibrato in harmonics crosses formant boundaries, which it easily does between around 1500Hz and 3000Hz, the lower or upper parts of vibrato cycles may be emphasised, with corresponding variation in the vowel and vocal timbre. The louder the note, the more evidently this happens, and so on longer, louder notes a singer produces a considerably more complex spectrum. In Gerhardt's case we can add into this picture her ability to vary vibrato when text or composition affords a more expressive result. The end result is that Gerhardt has at her disposal a considerable range of effects inextricably bound up with her vibrato.

4. SCOOPS

A feature of national style for German-trained Lieder singers of Gerhardt's generation is the 'scoop' or 'swoop', a fast slide up to the start of a note. Among later singers scoops were generally too fast to be perceived as slides, but are heard rather as emphases, and as such tend to be placed on particularly important words or at moments in a compositional phrase that, for harmonic, metrical and/or melodic reasons, afford the greatest degree of expressivity. Gerhardt's practice, though, is more varied, though not overall as marked as that of her slightly younger contemporary, Lotte Lehmann (b. 1888), who represents scooping at its most developed (Leech-Wilkinson, 2006a). Gerhardt's scoops become barely perceptible at around 0.03 secs, and remain sensed only as emphases up to around 0.18 secs. From around 0.22 secs they are clearly slides, and Gerhardt commonly extends them as far as 0.45 secs, a slow slide up to a note of a sort that rapidly fell from favour among the following generation.⁷

The effect of a scoop depends on several features of the context. In a fast and rhythmical performance its only function may be to emphasise specific words in the text or notes in the musical structure. Gerhardt's two recordings of 'Der Musensohn' illustrate this well. The earlier (29 May 1924) uses fast scoops up to 'alles' (0' 18", borderline perceptible as a slide) in 'bewegt / Sich *alles* an mir fort' (*everything* moves with me) and to 'Denn' at the beginning of stanza 4 (1' 15"), 'Denn wie ich bei der Linde' (*For* when by the Linden tree I find young people. Sound Example 12). The latter is not so obviously word-led, but rather brings to the picture conjured up by the text and key-shift to mediant major a sense perhaps of surprise or stealth (the suddenly rising voice indexing conventional vocalised surprise). In the later recording (11 May 1928) Gerhardt adds two further scoops, both less prominent. At stanza 2's 'Sing' ich noch *jenen* Traum' (I still sing *that* dream, bb. 41-8), occurring three times (0.06 secs, 0.05 secs, 0.3 secs in length) Gerhardt emphasizes not so much 'jenen' as the magical quality of a dream, the scoop here indexing wonder as conventionally expressed in speech vocalization. The other is at 'findet / Sich *auf* bebauten Höhn' (bb. 61-3), which with its significant 0.16 sec length is so trivial as text illustration that it seems to function only as quasi-rhythmic emphasis in the metrical structure. (Sound Example 13.) We see in this pair of performances, then, scoops used as effects borrowed from speech, emphasizing moments in the text, and also as purely rhythmical effects, emphasis in the pitch domain doing rhythmic work in the metrical structure.

But scoops relate also to the world of portamento which, as I have argued in detail in a previous study (Leech-Wilkinson, 2006b), indexes the slides of carer-infant vocalization in order to bring a powerful, perhaps (because naturally selected) an ineradicable sense of intimacy and loving safety to a musical performance. These associations are very clearly invoked in the extensive scooping of Gerhardt's 'Das Rosenband' (11 May 1928, following immediately on the same disc-side from the second recording of 'Der Musensohn'). The text's description of a sleeping woman whom the poet loves at first sight involves the sleep motif to which Gerhardt applies unusually heavy portamento in 'Schlaflied' (discussed further below). Here she scoops at least once in almost every bar, producing a high concentration of affective vocal gestures. She tends to scoop on the same notes in each of the two stanzas, implying that the scoops are here not here as much to bring specific associations to particular words as to imbue the whole song (by invoking 'parentese') with a sense of protective love. Where there are differences between the two stanzas a reason is often easy to find (italics indicate scoops): '*wachte*' as the girl wakes (stanza 2), the absence of a scoop on 'auf' (she wakes UP, stanza 2; cf. '*schlummerte*' in stanza 1), '*fühlt es wohl*' (stanza 1) as opposed to '*um uns ward*' (stanza 2, a case which clearly has nothing to do with the text but perhaps works better with the changed accompaniment), and more interestingly '*und wüßte es nicht*' (stanza 1) as opposed to '*Elysium*' (stanza 2) where the long scoop to 'si' in particular emphasizes the sensuousness of the word and (in this text) its associations (Sound Example 14). We do not and surely would not expect to see a single function for scooping through these examples. Its associations and effects are various, and can therefore be drawn on in a range of different contexts. Gerhardt deploys quite a wide variety of scoops, and in this song in particular takes them much closer to portamento

than most of her contemporaries. We should see this, perhaps, as an indication of the extent of the associative imagination that underlies Gerhardt's expressivity and that made her singing so appealing in its day.

5. PORTAMENTO

Curiously, or perhaps as a result, Gerhardt uses portamento in normal singing considerably less than many of her colleagues. Apart from the special cases I shall discuss in a moment, the early recording of 'An die Musik' (30 June 1911) shows the heaviest use of portamento in her surviving work. Here every portamento slide is downwards, and its only function seems to be to increase melodic continuity, overcoming Gerhardt's strong tendency otherwise to separate notes (on which see Plack, 2008, p. 38). This is another sense in which she is characteristic of her generation, as the 1910s and 20s saw in general, especially among German singers, a retreat from the melody-driven singing of the oldest generation on record (classically Adelina Patti, b. 1843). By treating each note separately it was easier to allow each the possibility of being expressive in a slightly different way from one note to the next. In other words, it is driven by an inflation in the value of emotional as opposed to purely melodic singing.⁸ Portamento, while useful in special cases, is somewhat at odds with this newer approach, and so it is not surprising to find it declining. Gerhardt is relatively radical, though, in the extent to which she avoids portamento in her later work, except in very special cases. Later examples are rather striking, therefore, when they occur.

The 1925 recording of 'Wohin?' uses a big upward portamento (0.26 secs) to the melodic climax of the final stanza ('Mülleräder in', b. 71), which Gerhardt cuts right back in the 1927 recording to 0.09 secs (Sound Example 15). 'Liebesbotschaft' (11 February 1926) employs a very similar upward slide in the structurally equivalent place, the final melodic climax of the song (on 'Träume', b. 65. Sound Example 16). But both these cases have large ascending leaps at crucial structural positions, and it would seem almost perverse to eschew portamento for a singer of any generation in which portamento was acceptable (as it has not been for most later singers). Though, on the whole, Gerhardt's personal style does not find much room for portamento, there are some very remarkable exceptions. The most striking of these is 'Schlaflied' (also known as 'Schlummerlied'), recorded on 9 May 1928.⁹ I have referred to this performance already and have written about it extensively elsewhere (Leech-Wilkinson 2006b). Portamento here is doing special expressive work, evoking carer-infant communication in a song addressed to a sleeping child, and it does this with remarkable intensity, the more so for being so uncharacteristic of Gerhardt in general.

In fact we can think of this style as a separate manner developed by Gerhardt and held in reserve for special occasions. This is one of them. Another is the 'Romanze' ('Der Vollmond strahlt auf Bergeshöhn', D. 797, no. 3b) from Schubert's incidental music for Helmina von Chézy's play, *Rosamunde: Fürstin von Zypern*,¹⁰ which Gerhardt recorded earlier on the same day, 9 May 1928. The scoop-rich style of 'Das Rosenband' is here too, but with portamenti (up and down) and at times a near merger between the two. Thus some portamenti are shorter and narrower than some scoops, and the difference is only

one of function: scoops lead up to new notes, portamenti join old to new, and can lead downwards as easily (indeed, more easily) than upwards. Together they produce a much more connected melodic line than in Gerhardt's normal singing, a kind of reconstruction in modern guise of pre-verismo style (though of course the effect is quite different, far more specialised). Consonants are made as soft as possible for the same purpose, removing the principal obstruction in German singing to melodic vocalisation in the Italian manner. Many notes crescendo from the start, and a good number go on to decrescendo towards the end, again softening the disjunction from note to note. Notes which set 'n' sounds tend to nasalize these earlier than usual, producing a more rapid decrescendo.

6. TUNING

Gerhardt's tuning is hard to measure precisely in relation to the piano because of her vibrato, but here in 'Romanze' she seems to eschew her normal tendency to sharpen notes; and the long scoops which keep a substantial part of a note below pitch may also contribute to a sense that the vocal line is being pulled down and intervals somewhat narrowed, resulting in a warmer, less dominant vocal sound. Her vibrato is very markedly narrowed, falling between 80 and 200 cents rather than the more typical 160–320 cents. It barely overlaps, for example, with her vibrato in 'Der Abschied', the side recorded on 9 May 1928 between 'Romanze' and 'Schlaflied', whose vibrato ranges between 200 and 300 cents almost throughout. (The rate, at 0.15–0.17 secs per cycle, is as usual: it is much harder to change vibrato speed than extent.) Many notes begin with almost no vibrato and introduce it slowly, generating in this context a sense of naivety, set apart from the everyday world. Similarly the slow scoops strongly suggest, in this expressive environment, the concentrated intimacy indexed by parentese. The gestures summarised here all tend to restrain a normal style, pulling back, looking inwards, depressed, thoughtful, sad. Nonetheless, Gerhardt's vibrato remains characteristically irregular when examined closely. Many notes, and especially those towards the end (3' 11" onwards), show quite gross irregularities in pitch, and yet these remain too small and are over too quickly to be perceived as imperfections: rather one senses colour, subtle variations of intensity, and vulnerability, clearly generated subconsciously by the irregularities.

Another feature of style that is particularly well illustrated by this performance of the 'Romanze' is Gerhardt's responsiveness to changing harmonies in the accompaniment. The long notes at 1' 02" (b. 17), at 2' 10" (b. 33) and at 3' 24" (b. 49) offer good examples of widening vibrato coordinated with loudness, intensity and harmony (Sound Example 17). More complex is 1' 38"–1' 45" where changes in the vibrato coincide with changes in the piano harmony: at 1' 39" the quietening pulls back the upper harmonics and dulls the sound as the harmony turns minor; at 1' 42.5" it widens for the dominant 7th (b. 27i), and then (1' 43.9") narrows somewhat for the accented passing-note and its resolution (b. 27ii) (Sound Example 18). Spectrographic analysis of three notes on the same pitch starting at 2' 57.8" (b. 44) shows the last, from 3' 00.7", to be about 20 cents flatter, a difference which is easily perceptible:¹¹ it is matched to this note's resolving immediately downwards, whereas the two previous notes marked the top of the phrase. The text here is 'im Tode dein' (yours in death; Sound Example 19, first extract). The

equivalent place in the first stanza is 0' 39.1"—42.2" (b. 12). (Sound Example 19, second extract.) Here the first and second notes are each drifting up, but the third, though very irregular, is falling overall, making the same point about sensitivity to melodic and harmonic context. The text here is 'ist so schön', which is of course more positive. That also concords with the suggestion that tuning and harmony are intentionally matched: 'schön' here sounds more comfortable and grounded after the upwardly straining 'ist so'.

These are, from a perceptual point of view, rather subtle examples, and one would need a lot in order to be fully convinced; but the possibility that there is a consistent relationship could be tested in a more detailed study. At this provisional stage one can only suggest that there is logic to Gerhardt's expressivity which is apparent in many different kinds of details, and which relates coherently musical structure, sound and response. Fundamentally, I suggest, this is the relationship that performance has to create in order to be deeply persuasive. Such relationships are made by performers and found by listeners, it hardly needs to be said, through the modular brain's unending attempt to find similarities between components of sounds and components of other things (Leech-Wilkinson, 2010).

7. RUBATO

Gerhardt's detailed habits of rubato—expressive flexibility in the length of beats—are relatively consistent. She has a marked tendency to begin scooped notes early, treating most of the scoop as an *appoggiatura* before the beat, which gives the emphasis brought to the word/note a double aspect. *Ritardandos* at major climaxes can be very large indeed, even in her later performances, though (as the following discussion of data confirms) they become fewer and the basic tempo is left later and restored more quickly. In general, tempo slows more gradually than it speeds up, so *accelerandos* are rarer than *ritardandos*, and approximate basic tempi (in so far as any Gerhardt tempo is consistent enough to be called 'basic') are restored at once, not through gradual speeding up. This is most obvious in the piano interludes, where the pianists almost always restore a faster tempo than Gerhardt's, slowing again when the voice re-enters. This is very much a period habit, reflecting the lower status of accompaniment and accompanist. The aim, one often feels, was to get on to the next vocal phrase as fast as was decently possible. But in vocal phrases, too, Gerhardt normally does not linger at a slower tempo once the music-structural or textual reason for a *ritardando* has passed. A single example can stand for a great many: 'Die Forelle', b. 38, where the tempo is restored immediately the large *ritardando*—marking both the trout revealed struggling on the fisherman's line and the music-structural climax—has done its work.

There is not the space here to give proper attention to the relationship between singer and accompanist. Comparing the few Schubert songs she recorded more than once with different pianists reveals very similar habits of rubato, and this suggests that Gerhardt's accompanists learned in rehearsal how she liked a song to go, and then did their best to anticipate (usually very successfully) the placing and extent of her *ritardandos* in performance. Nevertheless, they bring some remarkably interesting details of their own on occasion, none more so than Paula Hegner's handling of the chromatic

sextuplets in 'Die Forelle', which form a shorter first beat in every bar in which she has control (and some in which she probably should not), their accelerando seeming to evoke the motion of the trout in the water, which was presumably Schubert's thought too (Sound Example 20).

But we can attempt to look, also, at how Gerhardt's rubato changed over her career. Measuring rubato is very easy, but analysing the data is not.¹² Rubato depends to a very large extent on how the performer imagines the character of the composition. Does she understand the piece as thoughtful ('An die Musik', 'Du bist die Ruh') or cheerful ('Der Musensohn', 'Das Lied in Grunen'), or does it have moments that seem to her to require great flexibility within a much more constant norm ('Die Forelle', 'Der Lindenbaum')? And so on. Every piece is different in character and therefore seems to encourage different extents of rubato from moment to moment, responding to what she perceives to be the emotional implications of the shifting musical and verbal texts. Where we have several recordings of the same song made at different moments in her career, we can test relatively easily whether her rubato practice changed.

One of Gerhardt's first Schubert recordings, 'An die Musik' with Artur Nikisch (1911), has a range of crotchet beat lengths from 0.8 to 4.4 secs and a standard deviation (which has been used in other studies as a measure of rubato extent) of 0.57. By contrast, her 1924 recording with Harold Craxton shows a range from 0.7 to 3.2 and a SD of 0.33. The later recording appears to be almost 20% faster: what this amounts to in relative musical terms is a somewhat less extremely irregular performance at a somewhat less extremely slow speed. And it suggests that over time Gerhardt's taste for rubato may have declined. Boxplots of the beat lengths in the four recordings of 'Wohin?' seem to confirm a relationship with date, the marked outliers tending to become less numerous and less extreme in the later recordings (Figure 4).

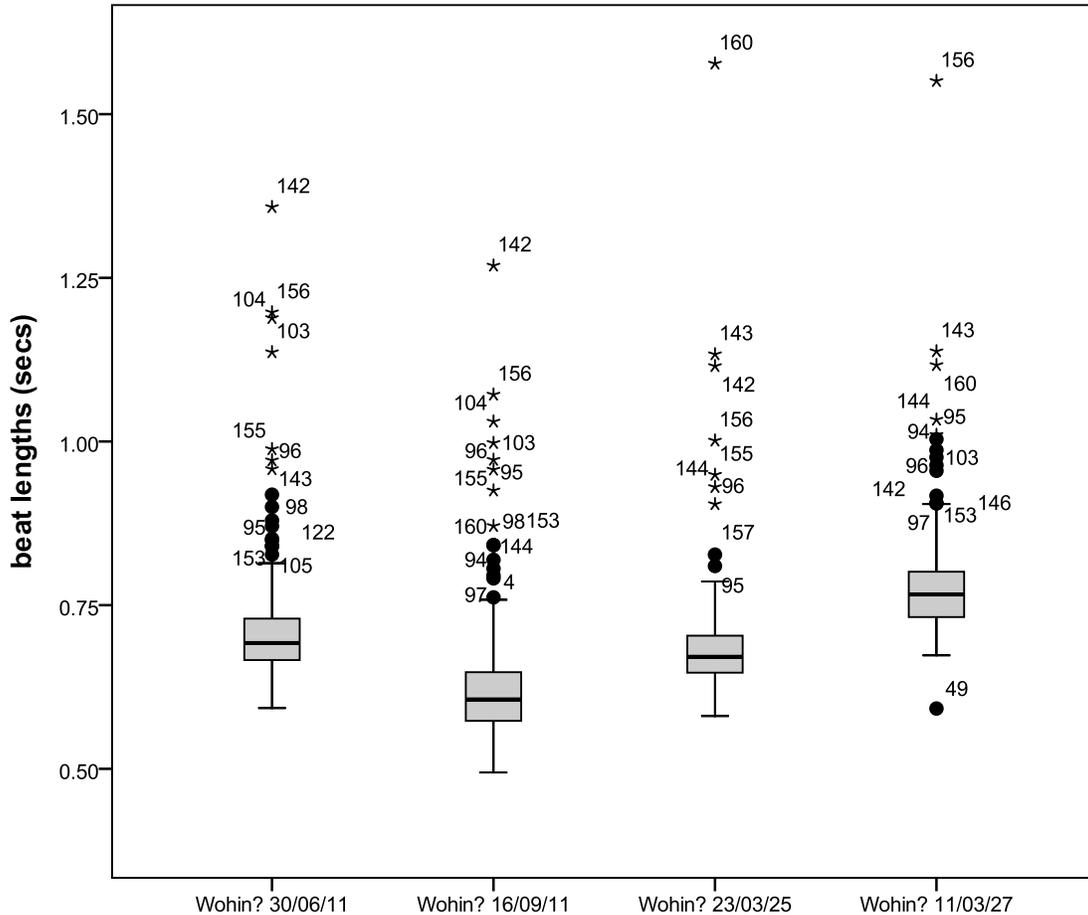


Figure 4: Gerhardt's beat lengths in four recordings of 'Wohin?' (Divide the outlier numbers by two to arrive at bar numbers in the score; figures from 159 upwards belong to the closing piano accompaniment.)

The two recordings from 1911, less than three months apart, are strikingly similar in the beats that are most extended (the upper outliers on the plot). The two later recordings have a slightly different pattern of outliers, suggesting that over time Gerhardt's musical understanding of the score altered a little.

But Gerhardt recorded few Schubert songs more than once, and no others this far apart. So if we are to study her underlying attitude to rubato we need to be able to compare performances of different scores in some useful way. To do this we need to be able to ignore the extremes—those beats whose wide difference from the value of the beats around them is determined first and foremost by the text and its relationship to the score—and focus instead on the inner range of beat lengths, that is to say the contents of the boxes in the boxplots above.

We also need a better measure of rubato than standard deviation. For these purposes skewness is much more useful, since instead of measuring variation in either direction from the mean, it reflects the tendency of the larger deviations to be in one or

other direction from the mean. In the case of rubato these larger deviations, at least for performers of Gerhardt's generation, are almost always above the mean beat length. Rubato for these musicians, as I have said, is a matter of slowing down towards a moment of heightened expressivity, and then returning much more immediately to something like a normal tempo (in so far as any one tempo can be thought of as the norm in performances like these). Skewness measures this one-sidedness well and, because it is corrected for the standard deviation, it responds only to the asymmetrical shape of the distribution of beat lengths and not to the overall speed of the piece, as the standard deviation inevitably does.

Figure 5 plots the skewness values of all Gerhardt's Schubert song recordings (save the four I've been unable to acquire—see Appendix) arranged in date order along the x axis. Positive values of skewness indicate that the larger deviations of beat length are above the mean.

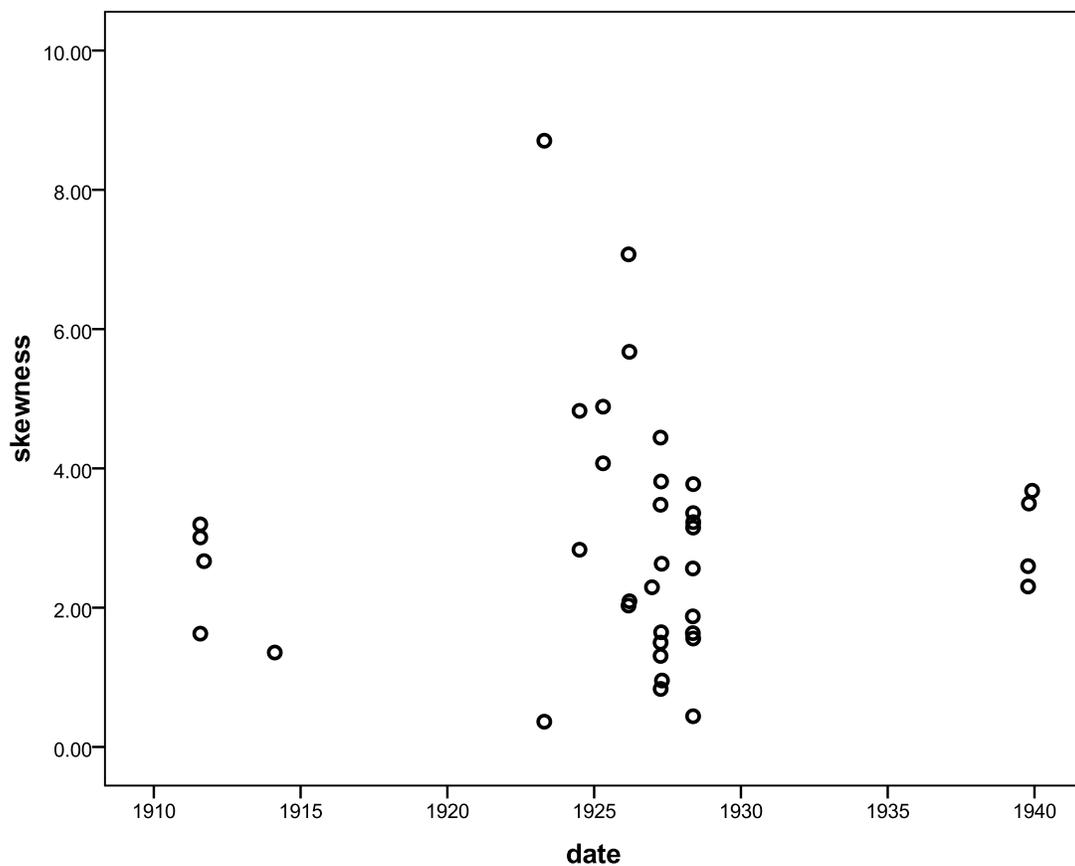


Figure 5: Beat-length skewness values for Gerhardt's Schubert song recordings

On the face of it this suggests an explosion of rubato in her performances of the 1920s, but in fact it is seriously misleading because of the greater number of different pieces recorded then and therefore the greater variety of opportunities for rubato in different

scores. A way of moderating the influence of the score is to calculate the skewness among the beat lengths that lie within the interquartile range (25% either side of the median), omitting therefore all the largest ritardandos or (though these are much less extreme) accelerandos. This leaves us with what we might call Gerhardt's 'normal' beat-to-beat rubato, as used in the absence of any large expressive gesture; and it produces a much more realistic spread (Figure 6) with the early performances near the top of the range, the first 'An die Musik' right at the top of the 1911 group, as subjective impression would lead one to expect. (The top point of the 1920s group is 'Der Tod und das Mädchen', whose score includes a tempo change which renders the skew data unreliable as evidence of overall rubato, and this piece should perhaps either be ignored or treated as more than one song.) A regression analysis yields an estimate for b of $-.01$, having a standard error of $.005$. The ratio of b to its standard error gives a t -value of -2.219 , with an associated (two-tailed) probability of $.033$, indicating a significant downward trend in rubato. The coefficient of correlation between skew and date is $r = -.347$, whose square, $r^2 = .12$, seems a plausible measure of the extent to which variability is shared between rubato and date, the remaining variation in rubato relating to other factors (probably still the score above all, perhaps to a lesser extent the accompanist, and other factors). The regression line described by the estimated equation is superimposed upon the skewness values in Figure 6.

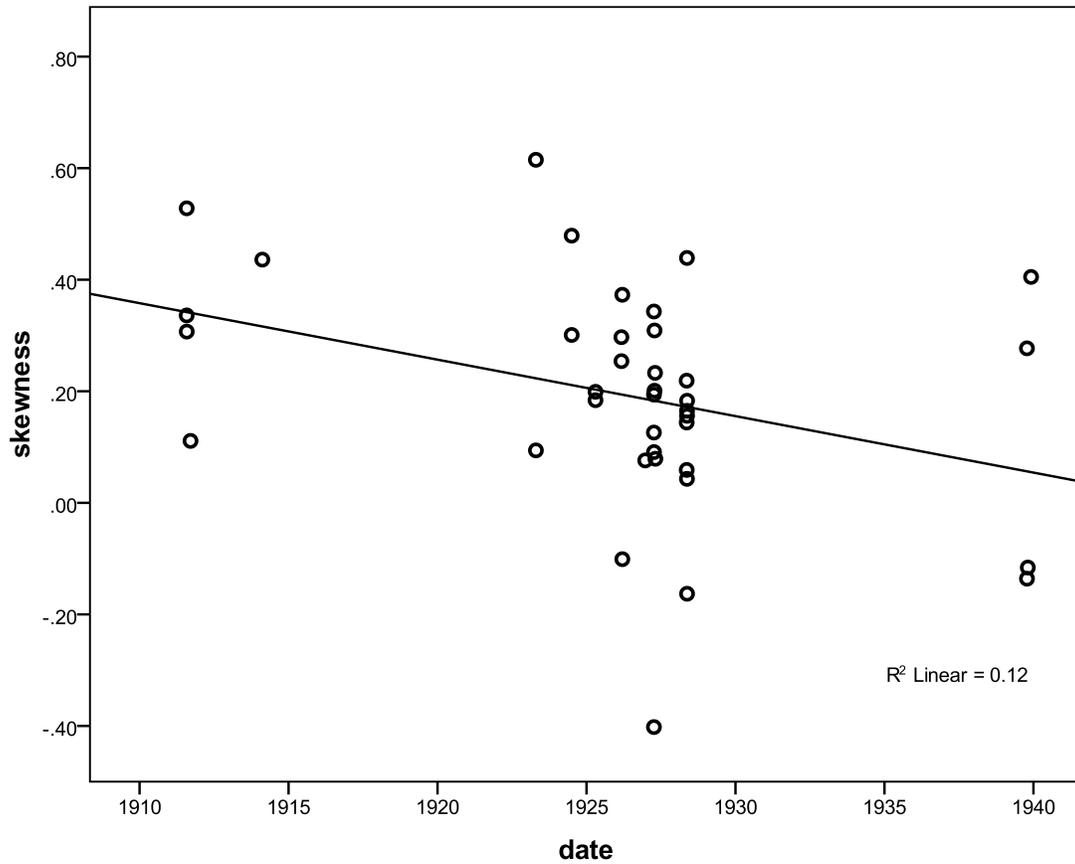


Figure 6: Skewness within the interquartile range as a measure of underlying rubato

The extensive spread of skewness values in the middle of the date range is no more than would be expected given that most of these recordings were made during the 1920s and bearing in mind that the larger a sample is the greater its spread is likely to be. That this is so is shown by a plot of the deviations from the regression line. Their distribution is close to that of a normal distribution (Figure 7), and there is no value which is certainly an outlier. Moreover a Pearson correlation confined to the 1920s data gives a value of -0.370 with an associated two-tailed probability of $.048$, indicating that the decline in skewness continues during the 1920s and is not simply an artefact of the lower skewness in the recordings of 1939.

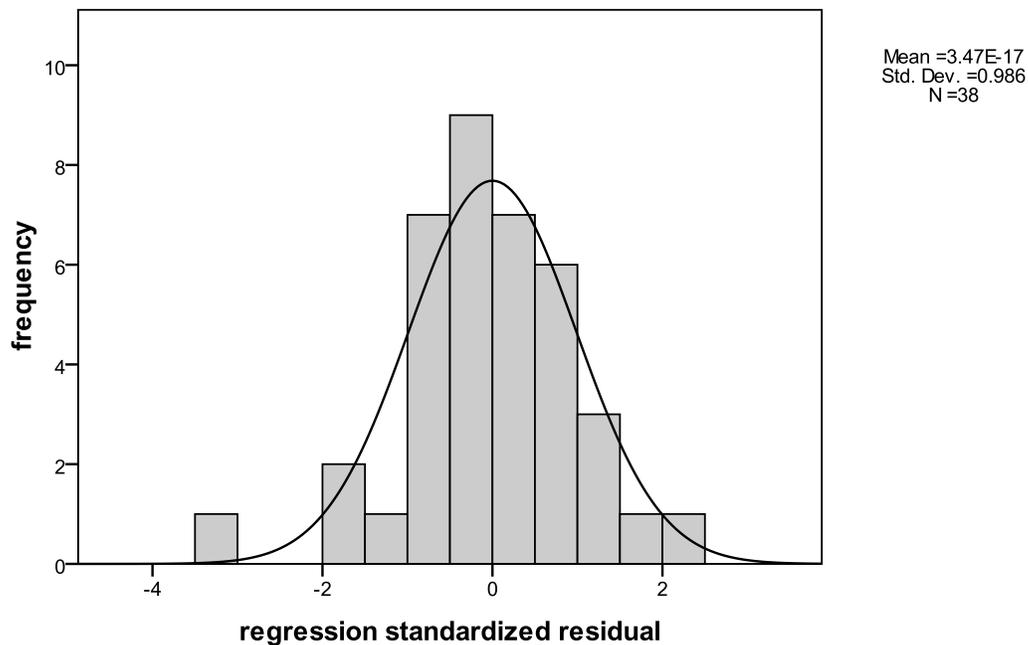


Figure 7: Deviations from Figure 6’s regression line (dependent variable: skew)

What these figures suggest is that although Gerhardt’s rubato was relatively consistent in manner, and although its extent varied greatly according to her response to each composition, nevertheless lying within the data is evidence that over time her rubato style did change, slowly but steadily. While as listeners we may find her performance style relatively consistent over her lifetime, we can now see that there is real and continuing change, which seems likely to be related to changing performance styles in the wider musical culture around her. The regression coefficient of $-.01$, indicating an average yearly decrease of skewness of $.01$ units, indeed seems a slow change, but, cumulated over 28 years, these small changes amount to the noticeable decrease of $.28$ units of skew. A broad hypothesis, then, might be that even among performers who seem to maintain a stable performance style over many years, gradual change—in the direction taken by other musicians—does occur. If performance style changes too slowly for anyone to notice while it happens, yet fast enough for it to be obvious when one looks back over a generation—which recordings show is clearly the case—it changes for the most part by many minute steps, each unrecognisably small as it is taken (Leech-Wilkinson, 2009). And that being so, the figures we see here are no less than one would expect to see if the vast amount of data necessary to test this hypothesis properly were available. That does not mean to say that the hypothesis is anything like adequately tested by this sample. It simply gives us food for thought, and further reason to test on a larger scale. Gerhardt’s non-Schubert recordings would be a good place to start.

8. PORTAMENTO WITH RUBATO

There are endless examples of finer details of timing characteristic of Gerhardt and her contemporaries which index quite specific meanings when taken together with the text. (Obviously, both signals are needed, the text to pin down one from the range of possible associations that each sound affords.) Rather than offer a scattering of very different examples, I should like to focus on just one technique for which Gerhardt has a particular fondness. Portamento and rubato tend to be used together, applying expressive weight in two parameters simultaneously, just as we saw for scoops and beat anticipations. Many of Gerhardt's gestures are not subtle, and this duplication of signals in different domains is one reason for that impression. Bars 71-2 of her 1925 'Wohin?' (1' 35.6"–1' 37.8") offer an obvious example, where a long portamento across a leap of a 7th is combined with a crescendo and a ritardando to mark this unmistakably as the emotional climax of the performance (Sound Example 21). A similar example exists in both performances of 'Der Musensohn' at b. 103 (1924 1' 43", 1928 1' 48": 'wann ruh' ich ihr am Busen' (when rest I on her bosom)), albeit slightly scaled down in 1928 (Sound Example 22): again, portamento, crescendo and ritardando work together.

There are less obvious examples. In 'Die Forelle', at 1' 44.4" (b. 45: 'die Betrogne' (the cheated one)), and at 0' 26" (bb. 11-12: 'süBer Ruh' (sweet peace)), portamento and rubato combine with diminuendo for more compromised affects (Sound Example 23). In 'Im Frühling', at 25" (b. 7: 'das Lüftchen' (the little breezes)), separated quavers (indexing the diminutive) drift upwards for 'das Lüft-' and then scoop up and slide down for '-chen', all in a slightly lengthened, quietening bar, indexing perhaps the eddying of the breeze. At any rate, one perceives easily enough a sense of light movement (Sound Example 24). In 'Im Frühling', at 'ihrer' (42.5"–43.5", b. 11), ritardando and descending portamento model the surge of feeling at the poet's thought of 'her' (Sound Example 25).

And of course there are many more subtle examples. In 'Die Forelle', at 17.7" (b.5: 'launische Forelle' (the *moody* trout)), a portamento of just 0.17 secs is shaped by a slow start and then rapid acceleration through the curve so as to suggest a throw-away lightness that relates more to the light-hearted character of the musical fabric and of this early part of the story than to the word that's being set (Sound Example 26). It has a longer-term function than mere word-painting, then, expressed through its particular shape and speed. All these 'expressive gestures' (Leech-Wilkinson, 2006, chapter 8) work by indexing experiences from outside music in order to give it meaning. And the rubato/portamento pairing is just one example of a variety of means that Gerhardt can deploy for effects drawing on and combining into complex mixtures the associations we bring to sounds.

How these effects changed during her career can again be seen in a comparison of the multiply-recorded Lieder. Judging by their evidence (which needs to be tested in other parts of her output), Gerhardt's performance of a song remained in important respects unchanged over the years, even though, as we have seen, it may have become much less irregular. That is to say, she uses essentially the same expressive devices at the

same moments, albeit on a smaller scale (Plack, 2008, p. 112 ff). In this she was quite typical (Leech-Wilkinson 2009, chapters 4 and 6).

9. CONCLUSIONS

The kinds of details examined here, accumulating over Gerhardt's performances of many different compositions, lead to a personal style more flexibly expressive than was usual for her generation, which in turn led, despite her vocal shortcomings, to a strikingly successful career through decades of the twentieth century in which intense expressivity became the period-stylistic norm. Gerhardt's singing, controversial as it was (Plack 2008, 104), represented an ideal for many (Shawe-Taylor, 1987, p. 173; Leech-Wilkinson, 2009a, ch. 4). Her large recorded output, consisting of some 132 items (and there were a further 197 unissued), recorded in forty-one sessions from 1907 to 1948—far more than just the thirty-eight Schubert recordings considered for this study—offers huge potential for more detailed work on a singer's performance style and communicative language.

Why would that work be worth doing? Aside from the usual academic justifications—that it is interesting, that it is professionally useful in the sense that a subject can be made of it, that it is increasingly possible given the availability of suitable software for sound analysis, and that it is a stone one must turn in order to find out what lies beneath—there are, I think, at least five good reasons for taking this approach further in a more scientific direction, and over many more performers in different instrumental and vocal media from different periods. First, it may have some application in teaching and learning the art of performance, at the very least in sensitizing students to the huge range of possibilities for performance expressivity that lie outside the boundaries of current period style. Secondly, it illuminates the trade-off which seems to be unavoidable between vocal perfection and the integrity of melody, on the one hand, and the production of expressiveness through the indexing of speech, vocalizations, and sounds from life, on the other. Each generation, to judge by the evidence of 110 years of Schubert song recording, finds a different balance appropriate, and we need to know much more about why. Thirdly, it may help us understand how it is that performance style, differently for each generation, affords certain kinds of meanings to emerge from scores but not others. And fourthly, it is a necessary step towards the ultimate goal of understanding how musical compositional and performance styles relate to other kinds of style and thus to the changing cultural and communicative world around us.

But finally, it is important because, as claimed at the start, performance style necessarily lies beneath everything else that involves the sound of music, including every imagined, read or heard performance of a score. Scores may stay more or less the same (give or take fashions in editing), but the music produced from them changes radically. Responses to music, therefore, cannot be relied upon to remain stable over long periods of time, and research findings that depend on them are not reliable in the long term. We need to understand much more about performance style in order to allow for this effect in formulating and reusing research findings. Analysing personal and period performance

style is an essential step towards all these more nuanced understandings both of music and of our response to it.

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Appendix: Elena Gerhardt's Schubert Lieder recordings.¹³ (*Asterisked recordings not available to this study.)

D. no.	Title	Accompanist	Recording date	Matrix no.	Issue no.
D 795/02	Wohin?: Die schöne Müllerin - No. 2	Arthur Nikisch	1911/06/30	ab 13721 e	HMV 2-43405
D 547	An die Musik	Arthur Nikisch	1911/06/30	ac 5112 f	HMV 043202
D 776	Du bist die Ruh'	Arthur Nikisch	1911/06/30	ac 5113 f	HMV 043201
D 795/02	Wohin?: Die schöne Müllerin - No. 2	Arthur Nikisch	1911/09/16		Marston Records, 'The Dawn of Recording: the Julius Block cylinders', CD 3, track 29
D 776	Du bist die Ruh'	Bruno Seidler-Winkler	1914/01/12	1308 s	HMV 043258 / Polydor 72551
*D 795/02	Wohin?: Die schöne Müllerin - No. 2	Bruno Seidler-Winkler	1914/01/13	13435½ r	HMV 2-43438 / Polydor 70606 / Polydor 70607
D 531	Der Tod und das Mädchen	Ivor Newton	1923/03/23	03202	Vocalion B-3107 / Vocalion L 5036
D 328	Erkönig	Ivor Newton	1923/03/23	03206 X	Vocalion 70030 / Vocalion A-0215 / Vocalion C 1095
D 547	An die Musik	Harold Craxton	1924/05/29	03545 X	Vocalion 38017 / Vocalion A-0220 / [KCL copy C-0220]
D 764	Der Musensohn	Harold Craxton	1924/05/29	03547 X	Vocalion 21011 / Vocalion B-3112
D 795/02	Wohin?: Die schöne Müllerin - No. 2	Harold Craxton	1925/03/23	Bb 5913-2	HMV DA 706
D 917	Das Lied im Grünen	Harold Craxton	1925/03/24	Bb 5930-1	HMV DA 706
*D 917	Das Lied im Grünen	Harold Craxton	1925/03/24	Bb 5930-2	HMV DA 706
D 957/01	Liebesbotschaft: Schwanengesang - No. 1	Paula Hegner	1926/02/11	Cc 7884-2	HMV DB 917
D 118	Gretchen am Spinnrade	Paula Hegner	1926/02/11	Cc 7885-2	HMV DB 916 / Victor ND 196
D 343	Am Tage Aller Seelen (Litanei)	Paula Hegner (piano); Marjorie Hayward (violin)	1926/02/16	Cc 7912-1	HMV D 1462 / HMV DB 917 / HMV ES 401
D 774	Auf dem Wasser zu singen	Paula Hegner	1926/02/16	Cc 7913-1	HMV DB 916 / Victor ND 196
D 550	Die Forelle	Paula Hegner	1926/11/15	Bb 9436-1	HMV DA 835 / Victor NT 4133
D 911/13	Die Post: Die Winterreise - No. 13	Conraad Valentijn Bos	1927/03/09	Bb 10422-2	HMV E 460 / HMV EW 29 / HMV ER 233 / Victor 1342
D 911/15	Die Krähe: Die Winterreise - No. 15	Conraad Valentijn Bos	1927/03/09	Bb 10423-2	HMV E 460 / HMV EW 29 / HMV ER 233 / Victor 1324
D 911/05	Der Lindenbaum: Die Winterreise - No. 5	Conraad Valentijn Bos	1927/03/09	Cc 10420-2	HMV AB 276 / HMV D 1262 / HMV EJ 156 / HMV ES 273 / Victor 6846 / Victor ND 461
D 911/11	Frühlingstraum: Die Winterreise - No. 11	Conraad Valentijn Bos	1927/03/09	Cc 10421-2	HMV AB 278 / HMV D 1263 / HMV EJ 155 / HMV ES 274 / Victor 6881
D 911/24	Der Leiermann: Die Winterreise - No. 24	Conraad Valentijn Bos	1927/03/09	Cc 10424-2	HMV D 1264 / HMV EJ 154 / HMV ES 275 / Victor 6838 / Victor ND 535
D 795/02	Wohin?: Die schöne Müllerin - No. 2	Conraad Valentijn Bos	1927/03/11	Bb 10437-2	HMV DA 1219
*D 911/20	Der Wegweiser: Die Winterreise - No. 20	Conraad Valentijn Bos	1927/03/11	Cc 10435-1	HMV EJ 154
D 911/20	Der Wegweiser: Die Winterreise - No. 20	Conraad Valentijn Bos	1927/03/11	Cc 10435-2	HMV D 1264 / HMV EJ 154 / HMV ES 275 / Victor 6838 / Victor ND 535
D 911/01	Gute Nacht: Die Winterreise - No. 1	Conraad Valentijn Bos	1927/03/24	Cc 10486-2	HMV AB 276 / HMV D 1262 / HMV EJ 156 / HMV ES 273 / Victor 6846 / Victor ND 461

D 911/06	Wasserflut: Die Winterreise - No. 6	Conraad Valentijn Bos	1927/03/24	Cc 10487-2	HMV AB 278 / HMV D 1263 / HMV EJ 155 / HMV ES 274 / Victor 6881 / Victor NS 321
D 797/03b	Romanze (Der Vollmond strahlt)	Conraad Valentijn Bos	1928/05/09	Cc 12962-2	HMV D 1462 / HMV ES 401
D 957/07	Abschied: Schwanengesang - No. 7	Conraad Valentijn Bos	1928/05/09	Cc 12963-2	HMV D 1460 / HMV ES 400
D 527	Schlaflied (Es mahnt der Wald)	Conraad Valentijn Bos	1928/05/09	Cc 12964-2	HMV D 1460 / HMV ES 400
D 881	Fischerweise	Conraad Valentijn Bos	1928/05/11	Cc 12969-2	HMV D 1459 / HMV ES 399
D 957/10	Das Fischermädchen: Schwanengesang - No. 10	Conraad Valentijn Bos	1928/05/11	Cc 12970-2	HMV D 1459 / HMV ES 399
D 719	Geheimes	Conraad Valentijn Bos	1928/05/11	Cc 12970-2	HMV D 1459 / HMV ES 399 / Victor ND 321
D 280	Das Rosenband	Conraad Valentijn Bos	1928/05/11	Cc 12971-1	HMV D 1461 / HMV ES 402
D 764	Der Musensohn	Conraad Valentijn Bos	1928/05/11	Cc 12971-1	HMV D 1461 / HMV ES 402
D 882	Im Frühling	Conraad Valentijn Bos	1928/05/11	Cc 12972-1	HMV D 1461 / HMV ES 402
*D 717	Suleika II (Ach um deine feuchten Schwingen)	Conraad Valentijn Bos	1929/09/24	CLR 5647-1	HMV DB 1544
D 957/11	Die Stadt: Schwanengesang - No. 11	Gerald Moore	1939/10/12	OEA 8307-1	HMV GR 19
D 801	Dithyrambe	Gerald Moore	1939/10/12	OEA 8308-1	HMV GR 19
D 838	Ellens Gesang II (Jäger, ruhe von der Jagd!)	Gerald Moore	1939/10/20	OEA 8311-1	HMV GR 20
D 867	Wiegenlied (Wie sich der Äuglein)	Gerald Moore	1939/11/08	OEA 8312-2	HMV GR 20

¹ Complete transfers of all the Elena Gerhardt recordings discussed in this article, save three whose copyright is not owned by King's College London and from which I have not taken sound examples, may be downloaded from <http://www.kcl.ac.uk/kis/schools/hums/music/dlw/sound/eg/N.wav>, where N is the sound example number; thus sound example 1 is 1.wav, etc. Copyright in all the sound files used here, except Sound Example 2, belongs to King's College London © 2009, and they should not be published elsewhere except by permission. Contact the author in the first instance. Sound File 2 is extracted from 'Schubert Lieder', HMC 901991, track 2 (recorded 2007), © Harmonia Mundi 2008; used here under the provision in the UK Copyright Designs and Patent Act 1988, Section 30, allowing fair dealing for purposes of criticism or review.

² The only substantial studies of Gerhardt's singing to date are Shawe-Taylor (1987) and the much more detailed Plack (2008, especially pp. 104-118), which focuses valuably on Gerhardt's technique.

³ I am happy to express my thanks to Andrew Hallifax for making the transfers as part of the CHARM transfer project, to Karsten Lehl for supplying raw transfers of 78rpm discs from his collection, and to Simon Trezise for providing a crucial recording.

⁴ There is no way, since it was hardly ever noted in the record company paperwork, of knowing the exact speed at which a particular recording lathe revolved, and therefore we cannot know the correct speed at which to play the published discs. A speed change brings a change in pitch (faster = higher). So speed/pitch can only be guessed, based on experience of a singer's other recordings (which of course are subject to the same problem). In the end, each transfer engineer makes a choice based on what sounds 'natural' to them. Through Gerhardt's recordings, as transferred by the CHARM team, there does seem to be a trend towards transposition down as she gets older, which one would expect, and this gives us some reason to hope that our transfers are broadly appropriate.

⁵ A convenient way to compare these is to import the sound file into the sound analysis software Sonic Visualiser (www.sonicvisualiser.org) and use the select tool (the arrow icon) and CTRL to select both notes, then press 'play', having previously selected the 'constrain playback to selection' and 'loop playback' buttons.

⁶ The timings refer to the full transfer available at <http://www.kcl.ac.uk/kis/schools/hums/music/dlw/sound/eg/>.

⁷ It is extremely difficult to be precise about the lengths of scoops: the main pitch has to be perceived through vibrato, and it is hard to pinpoint exactly where the scoop ends and the first vibrato cycle begins to define the central pitch, whether through self-observation assisted by spectrograms (the method used here) or by experiment. More research is needed.

⁸ Plack, 2008, chapter 2, helpfully focuses on 'registration' in discussing the contrast between melody-driven and expression-driven singers, and sees these approaches as two continuing options rather than symptoms of changing aesthetics.

⁹ For a tiny confirmatory example, which illustrates how the association worked for Gerhardt, see 'Liebesbotschaft' (bb 55-6, 2' 11"-2' 18") at the words, 'wiege das Liebchen in *Schlummer* ein'.

¹⁰ *Rosamunde: Drama in fünf Akten von Helmina von Chézy; Musik von Franz Schubert. Erstveröffentlichung der überarbeiteten Fassung; mit einer Einleitung und unbekanntem Quellen.* Ed. Till Gerrit Waidelich. Veröffentlichungen des Internationalen Franz Schubert Instituts, xii. Tutzing: Hans Schneider, 1996.

¹¹ Measured in Sonic Visualiser using the harmonic cursor's horizontal line (values at the left) placed centrally in the cycles to estimate the average frequency.

¹² Sonic Visualiser was used to tap the beats, and the placement of markers was then corrected by hand and the inter-onset interval measurements exported to SPSS. I owe a very great debt of gratitude to John Valentine for discussion of the best ways to analyse this data, for guiding me through the process and refining my reporting of it.

¹³ Data kindly provided by Karsten Lehl.