Phonological analysis of consonance:
A case study of a 19th-century poet's works

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Abstract. Rhymes (as a poetic device) in English poetry can be roughly classified into two types: a perfect rhyme, in which both the nucleus and the coda of the last syllable in a line are repeated, and an imperfect rhyme, in which either the nucleus or the coda is identical. Among sub-classes of imperfect rhymes is consonance, which has an unmatching nucleus and an identical coda. Prior studies have shown that vowels in consonance pairs are phonologically restricted; Zwicky (1976) points out that the difference in features of the vowel in a pair must be one feature, and Okazaki (2014) argues that vowels in consonance pairs must be "a perfect rhyme at an underlying level" (p.119). This paper analyses the poems by Gerard Manley Hopkins using the same technique developed by Zwicky (1976), with a finer definition of features, and with examples containing weak vowels and diphthongs (which were not found in Zwicky (1976)'s data). After reading through the poems and collecting examples of consonance pairs, a list of words and the vowels used was created. Finally, phonological features of the vowels were compared to evaluate their similarity. The result shows that the "one-feature-apart rule" suggested by Zwicky (1976) also holds true for consonance pairs in poems by Hopkins, and also for pairs containing diphthongs and weak vowels.

1. Introduction

Rhyme is inarguably one of the most essential poetic devices in English poetry. Ever since the time of *Sir Gawain and the Green Knights*, poets have made maximum effort to choose the right word that comes at the end of each line and would create a soothing rhythmic effect as one read through the stanzas. Rhyme – a repetition of identical or similar sounds at line ends – is so widely

used that it can be found not only in most poems but also in the lyrics of popular songs. Almost every poet, except for when using blank verse or other special forms, follows the rule of rhyme as they weave their thoughts into English poems.

The essence of rhyme is the repetition of an identical or similar sound. This can be described using the terminology of phonology as repeating the nucleus and the coda (if any) of the last syllable in a line. Among the sub-class of rhyme is consonance, which is a slightly loosened version of a full rhyme. Consonance typically repeats the consonants but has a different vowel, as in the following example:

(1) What immortal hand or *eye* /aɪ/[1]

Could frame thy fearful *symmetry*? /sɪmətri/

William Blake, *The Tyger*

Here, consonance is used to rhyme *eye* and *symmetry*, a pair that would not be allowed in a familiar perfect rhyme.

Again, the essence of rhyme is the repetition of sounds; if the pair of nucleus and coda sounds too distinct, it cannot work as a rhyme. Then, the question arises: How similar must vowels be when a poet uses consonance? This paper looks at consonance in works of the 19th-century poet, namely Gerard Manley Hopkins, and examines phonological properties of sounds used in pairs of consonance.

2. Rhymes and their sub-classes

In poetry or lyrics of popular music, (a narrowly defined) rhyme is a repetition of an identical or similar nucleus and coda (if any) belonging to a line-final syllable. Here is an example:

[1] Pronunciations of words cited in this paper are from *Longman Pronunciation Dictionary*, unless otherwise specified.

(2)

1. Who loves me here and has my *love*,
2. I think he will not tire of me,
3. But sing contented as the *dove*
4. That comes again to the woodland tree.

[…]

Gerard Manley Hopkins, *Daphne*

(Line numbers and emphasis added)

The nucleus and coda (if any) of a line-final syllable are 1. [ʌv] 2. [iː] 3. [ʌv] 4. [iː]. Here, the sounds are repeated at line ends, constituting a rhyme.

Some dictionaries and handbooks define rhyme differently. For instance, *the Princeton Handbook of Poetic Terms* (2016) describes rhyme as follows:

> "the linkage in poetry of two syllables at line end [...] that have identical stressed vowels and subsequent phonemes but differ in initial consonant(s) if any are present"

(Greene & Cushman, 2016, p. 294)

The difference from our definition is that it is not only a nucleus and coda of a line-final syllable but also phonemes following stressed vowels that should be identical. However, we can easily find examples in which only the nucleus and the coda of a line-final syllable are repeated, as cited below:

(3)

[…]

17. Things that she likes seems often to despise,
18. And loves – a fatal fault – to patronize;
19. Has wit enough, if she would make it *known*
20. And charms-but they should be more freely *shewn*.

[…]

Gerard Manley Hopkins, *Miss Story's character*

(Line numbers and emphasis added)

Here, only /aɪz/ is repeated in lines 17 and 18. Nevertheless, they function perfectly as a rhyme. Therefore, in our definition of rhyme, repetition does not necessarily have to be a stressed vowel and sounds following it; rhyme is a matter of line-final nucleus and coda.

We now proceed to a definition of sub-classes of rhyme. Rhyme is roughly classified into two types: perfect rhyme and imperfect rhyme. Perfect rhyme is the most typical of rhymes, and also the one that is used most often: a repetition of an identical nucleus and coda (if any) belonging to a line-final syllable. Imperfect rhyme, on the other hand, is a slightly loosened version of perfect rhyme: either or both of the line-final nucleus and coda (if any) are similar, but not identical. If the coda is different, it is called assonance, and if it is the nucleus that does not match, it is called consonance. An example of consonance is as follows:

(4)

[…]

17. There is a vapour stands in the *wind*;
18. It shapes itself in taper skeins:
19. You look again and cannot *find*,
20. Save in the body of the rains.

[…]

Gerard Manley Hopkins, *The Earth and Heaven*

(Line numbers and emphasis added)

This example follows the so-called abab rhyming pattern (odd-numbered lines and even-numbered lines rhyming respectively), and *wind* – *find* is used as a rhyming pair. This pair shares the same coda, but has mismatching nuclei.

Finally, assonance and consonance can be used together, as in the following example:

(5)

[…]

15. The bell-drops in my mallow's *mouth*
16. Hów are théy quenchèd *not*?
17. These drops in starry shire they drew:
18. Which are théy? stars or dew?

[…]

Gerard Manley Hopkins, *St.Dorothea*

(Line numbers and emphasis added)

This section of the poem follows an *aabb* pattern (two consecutive lines rhyming), and *mouth – not* is a rhyming pair. In this example, both the nucleus and the coda are different – /aʊ/ and /ɒ/, /θ/ and /t/. Although this kind of assonance-consonance hybrid pair is relatively rare, they are observed not only in poetry but also in lyrics of popular music.

3. Previous studies

There are only a few papers on consonance from a phonetic or phonological perspective.

3.1 Zwicky (1976)

Zwicky (1976) is a study on irregular rhymes in rock music lyrics. Zwicky (1976) states that most of the consonance (as well as assonance) pairs in rock music have vowels that "are one feature apart in anybody's feature system" (p. 691). The most frequent of these are cited below:

ɪ – ɛ :	19 examples
ʌ – ɔ :	10
i – e :	9
ʌ – a :	8

u – o :	6
ε – æ ε – e	4
a – ɔ :	6

(Zwicky, 1976, p. 691)

Taking the first pair for example, /ɪ/ – /ε/ as in *winds* – *ends* (p. 691) share every feature except for their openness, with /ɪ/ being a *close* front unrounded vowel and /ε/ a *mid* front unrounded vowel. Zwicky (1976), based on these facts, calls consonance *feature rhymes*.

3.2 Okazaki (2014)

Okazaki (2014) is another study on consonance, focusing on its use by modern-day poets. Okazaki (2014) states that consonance can be grouped into the following three types:

a) Pairs corresponding to a vowel alternation triggered by suffixation
b) Pairs to a vowel alternation triggered by ablaut
c) Pairs consisting of multiple pairs coupled by a common vowel

Examples:

a)	st*ee*l – t*e*ll	[i:] – [e]	<<	ser*e*ne – ser*e*nity
b)	h*i*m – n*a*me	[i] – [ei]	<<	g*i*ve – g*a*ve
c)	th*e*se – *eye*s	[i:] – [ai]	<<	*ea*t [i:] – *a*te [ei]
				l*ay* [ei] – l*ie* [ai]

(Okazaki, 2014, p. 114 - 120)

Taking a) for example, [i:] – [e] in *steel* – *tell* is the same pair of vowels seen in a pair of suffixed and unsuffixed words such as *serene* – *serenity*; the same goes for b). Okazaki (2014), based on this fact, claims that type a) and type b) are actually "a perfect rhyme at an underlying level" (p.119); just as *serene* and *serenity* share the underlying vowel (and their surface forms are derived through

complex phonological rules), it is claimed that *steel* and *tell* also shares the same underlying vowel, making them underlyingly a perfect rhyme (despite the fact that *steel* and *tell* are not morphologically related). As for c), Okazaki (2014) describes such cases as a pair consisting of two or more pairs of alternating vowels, which are mediated by a common vowel; in example c), [ei] meditates and connects the two pairs [i:] – [ei] and [ei] – [ai] to form a pair [i:] – [ai].

4. Problems

4.1 Zwicky (1976)

Zwicky (1976) provides an important insight into the character of consonance: the vowels involved must be similar. However, it has to be pointed out that "the feature system" Zwicky (1976) refers to is only vaguely defined, using the word "anybody's feature system" (p. 691). Zwicky (1976) has not even clarified whether the "features" are *phonetic* features or *phonological* features. Zwicky (1976) citing Chomsky and Halle (1968) (henceforth SPE) to show the two-feature difference observed in an exceptional pair a – ɔ (p. 691) might suggest that the "features" are phonological ones, proposed in studies of Generative Phonology. The problem is that the symbols used by Zwicky (1976) do not correspond to the symbols commonly used in the SPE. For instance, "a" does not appear in SPE's feature system. In addition, Zwicky (1976) writes that "ɔ" is [-low] in the SPE. However, SPE actually lists ɔ as [+low] (p. 176). Even if we interpret "ɔ" as ɔ̄, we still get [+low]. The discrepancies illustrated so far suggest that Zwicky (1976) is using their own set of symbols and a (phonetic or phonological) feature system, the detail of which is unfortunately not provided therein. The blurriness of the basis of the discussion is an issue that must be addressed.

Another problem with Zwicky (1976) is that the data listed does not seem to include diphthongs. It is unclear whether diphthongs were not found in the data by coincidence or this is due to the way Zwicky (1976) lists the vowels. In anyways, data that includes diphthongs in a pair is necessary for the observation of diphthongs' behaviour in consonance.

4.2 Okazaki (2014)

Okazaki (2014) proposes an interesting approach to an analysis of consonance: the pairs are actually a perfect rhyme at an underlying level. However, taking a closer look at examples provided by Okazaki (2014) reveals that the data includes some pairs that cast doubts on this assertion. Taking *tell – steel* (p. 115) for example, this pair is said to parallel *serene – serenity*, sharing the same vowel /ē/ underlyingly. Assuming that this is true, it follows that [i:] in *steel* and [e] in *tell* are both underlyingly /ē/. However, there is no evidence other than this analysis that suggests the underlying vowel of *tell* is long. The assumption also leaves a shortening of underlying /ē/ undescribed; there seems to be no phonological rule that derives the surface form [e] from the underlying /ē/ in this context. Similarly, *date – that* (p. 115), which parallels *nation – national*, lacks strong evidence that their underlying vowel is /ǣ/, and a vowel shortening in *that* is left unexplained. These examples suggest that consonance being underlyingly a perfect rhyme is doubtful.

Another problem of Okazaki (2014)'s analysis is that it is unclear how the coupling of alternating vowel pairs (as illustrated in Example c) above) contributes to the rhyming effect of consonance. As Okazaki (2014) admits, some pairs must be analysed as two or more vowel alternations coupled by their common surface form. This means such pairs cannot be regarded as underlyingly a perfect rhyme. Then, why are such pairs used? This question is unfortunately left unanswered.

5. Study on consonance

5.1 Goals and Methods

This paper aims to perform a similar analysis conducted by Zwicky (1976) with a finer definition of symbols and phonological features. As we are interested in consonance used in British poems, we collected data from works by a poet from the late-19th century, namely Gerard Manley Hopkins (1844 - 1889). After we read through the poems and collected examples of consonance, we created a list of words and the vowels used. Finally, we compared phonological features of the vowels to evaluate their similarity. Details of the steps taken are as follows.

5.1.1 Choosing a poet and their work

We chose Gerard Manley Hopkins as the subject of this case study. One of the reasons we chose Hopkins is that he is a poet from the late-19th century and thus the difference between the phonology of present-day English and English used at Hopkins's time is small enough to be ignored. Although there are minor changes in vowel positions, such as the position of [ʌ] (Barber, 1978, p. 130), since the 19th century, there are no significant changes to the English phonological system that have to be taken into consideration. Since we are conducting a phonological comparison of vowels and not a phonetic comparison, changes to a vowel position do not pose a serious problem to our analysis.

5.1.2 Collecting the data

In collecting the data, we read through *Gerard Manley Hopkins* (The Oxford Authors series), a collection of works by Hopkins. As we read through the poems, we identified the rhyming pattern of each poem such as *abab* or *aabb* by looking at lines that rhyme perfectly. Then we looked for a pair of words that are supposed to rhyme according to the rhyming pattern but do not have the same vowel in their final syllable. Such pairs were collected as consonance pairs. Here is an example:

(6)

1. It was a hard thing to undo this knot.
2. The rainbow shines, but only in the thought
3. Of him that looks. Yet not in that *alone*,
4. For who makes rainbows by *invention*?
5. And many standing round a waterfall
6. See one bow each, yet not the same to all,
7. But each a hand's breadth further than the *next*.
8. The sun on falling waters writes the *text*
9. Which yet is in the eye or in the thought.

10. It was a hard thing to undo this knot.

Gerard Manley Hopkins, *It was a hard thing*

(Line numbers and emphasis added)

This poem has an aabb rhyming structure, as seen in *waterfall – all* (line 5 – 6), *next – text* (line 7 – 8). Following this pattern, it can be inferred that line 1 – 2, 3 – 4, 9 – 10 are also a rhyming pair. However, these lines end with words whose vowel in the final syllable does not perfectly match. Thus, we can conclude that they are consonance pairs.

There were some poems which have an unclear rhyming pattern and thus were impossible to identify rhyming pairs. An example is shown below:

(7)

1. He hath abolished the old drouth,
2. And rivers run where all was *dry*,
3. The field is sopp'd with merciful *dew*.
4. He hath put a new song in my mouth,
5. The words are old, the purport *new*,
6. And taught my lips to quote this word
7. That I shall live, I shall not *die*,
8. But I shall when the shocks are stored
9. See the salvation of the Lord.
10. We meet together, you and *I*,
11. Meet in one acre of one land,
12. And I will turn my looks to *you*,
13. And you shall meet me with *reply*,
14. We shall be sheavèd with one band
15. In harvest and in *garnering*,
16. When heavenly vales so thick shall stand

17. With corn that they shall laugh and <u>*sing*</u>.

Gerard Manley Hopkins, *He hath abolished the old drouth*

(Line numbers and emphasis added)

The poem does employ rhymes and is not a blank verse. However, there seems to be no pattern for which line rhymes with which. In such cases, the work had to be dismissed.

In checking the pronunciation of words, we referred to the Longman Pronunciation Dictionary 3rd edition (Wells, 2008) (henceforth LPD). Since Hopkins is a British poet, we cited Received Pronunciation. (Localized forms were not cited.) If there are multiple possible pronunciations in RP, we added every candidate to our consonance pair list.

Before proceeding to a comparison of phonological features, it is worth discussing whether symbols listed in LPD represent phones or phonemes. LPD calls its representation "generally phonetic" (p. xxxi). As inferred by the expression "generally", LPD does not adopt full phonetic representation, resulting in their transcription sometimes looking phonemic. For instance, LPD does not distinguish aspirated voiceless plosives from unaspirated voiceless plosives, transcribing, for example, *[pʰ]in* and *s[p]in* as *pɪn* (p. 614) and *spɪn* (p. 764), respectively. Indeed, it requires careful consideration before regarding LPD's symbols as phonemic – LPD makes an allophonic distinction regarding /t/ in American English pronunciation, for instance, transcribing *city* as *sɪt̬i*, *t̬* representing an allophone of /t/ (an alveolar tap). However, for most of the symbols representing English vowels and consonants, a distinction between allophones is not rigid. As for symbols representing vowels, LPD does not make an allophonic distinction at all (except for *i* and *u*, which will be discussed later). Therefore, we can treat vowel "phonetic" symbols in LPD as representing phonemes.

5.1.3 Defining the phonological features

Our last step is to define phonological features of the vowels. Our phonological feature system is largely based on a feature system proposed by Giegerich (1992). The merit of using Giegerich (1992)'s system is that its theoretical framework is simple and has enough number of

features to make a simple comparison between vowels. Features and their specifications are cited below:

	i	ɪ	u	ʊ	e	ɛ	o	ʌ	ɑ	a	ɔ	ɒ
[Consonantal]	-	-	-	-	-	-	-	-	-	-	-	-
[Sonorant]	+	+	+	+	+	+	+	+	+	+	+	+
[Continuant]	+	+	+	+	+	+	+	+	+	+	+	+
[Back]	-	-	+	+	-	-	+	+	+	-	+	+
[High]	+	+	+	+	-	-	-	-	-	-	-	-
[Low]	-	-	-	-	-	-	-	-	+	+	+	+
[Round]	-	-	+	+	-	-	+	-	-	-	+	+
[Tense]	+	-	+	-	+	-	+	-	+	-	+	-

Giegerich (1992, p. 110)

One of the problems in employing Giegerich (1992)'s system is that the symbols used by Giegerich (1992) are different from LPD. This requires us to "translate" the symbols when we wish to find feature specifications of vowels listed in LPD. Symbols in Giegerich (1992)'s feature system were interpreted as follows:

Giegerich (1992)	i	ɪ	u	ʊ	e	ɛ	o	ʌ	ɑ	a	ɔ	ɒ
LPD	iː	ɪ	uː	ʊ	eɪ	e	əʊ	ʌ	ɑː	æ	ɔː	ɒ

Another downside of Giegerich (1992)'s system is that it does not include diphthongs, schwa, or /ɜ/ (a neutralized vowel before /r/, as in *word*, *heard*, *bird*). To deal with the problem, we added further modifications to the proposed feature system, which are as follows.

First, we regarded diphthongs as a sequence of two vowels, each having its own phonological feature. For instance, /aɪ/ as in *find* is interpreted as /a + ɪ/. Note that /eɪ/ and /əʊ/, which are represented as diphthongs in LPD, are interpreted here as monophthongal tense vowels. The reason for this treatment is that, in RP, the diphthongization that results in /eɪ/ and /əʊ/ is autonomous. We therefore regard them to be monophthongs on a phonemic level, and on phonetic level diphthongs.[2]

[2] Even if we regard /eɪ/ and /əʊ/ as diphthongs on a phonemic level, the result in this study will not be affected; alternative analysis would make their feature specification [+high], but there were no examples that would deviate from the one-feature-apart rule if we adopt the new analysis.

Second, we added a new feature [place] which is defined as below:

[place]: a sound produced with its place-related features specified

Here, "place-related features" refer to a set of features that specify the place of articulation, namely [high], [low], [back], [round], and [tense].[3] In schwa and /ɜ/, which are defined as [-place], those sets of features are unspecified. This reflects the fact that schwa and /ɜ/ are neutralized vowels, positioned phonetically in the centre of the vowel space, which arose by full vowels losing their discriminatory features; full vowels weakened in unstressed syllables result in schwa, and in RP, /ʌ/, /ɪ/, and /e/ are neutralized before /r/, resulting in /ɜ/.

As for vowels transcribed as *i, u* in LPD, we treated them as having [tense] feature unspecified. Sometimes called a happY vowel, *i* denotes a neutralization of /iː/ and /ɪ/ in certain phonetic environments (Wells, 2014, p. 52); *u* is for neutralization of /uː/ and /ʊ/. In other words, vowels transcribed as *i* and *u* result from a loss of distinction between [+tense] and [-tense]. Therefore, we treated *i* and *u* as having no [tense] specification.

5.2 Results

The results are as listed below. Vowels on the left column in each table form a pair with vowels on the right column.

[3] [tense] is here classified as place-related feature because [+tense] vowels are generally produced with a tongue raised slightly higher than their [-tense] counterparts. (According to Ladefoged (2001, p. 40), a frequency of the first formant corresponds to a height of a vowel. Ladefoged (2001, p. 45) shows that vowel that we call [+tense] vowels have higher first formants than their [-tense] counterparts, except for /æ/ and /ɑ/.) [round] is also classified as place-related feature, because according to Halle (1992, p. 211), "± Rounded" belongs under the same node as other place-related features such as "±High", "±Low", and "±Back".

iː	i
iː	ɪ
iː	eɪ

ɪ	iː
ɪ	i
ɪ	e
ɪ	aɪ
ɪ	ə

i	iː
i	ɪ
i	aɪ

eɪ	iː
eɪ	e
eɪ	aɪ

e	ɪ
e	eɪ
e	æ
e	ə

æ	e

ə	ɪ
ə	e
ə	ɜː
ə	ɔː
ə	ʌ
ə	eə
ə	əʊ

ɜː	ɔː
ɜː	ə

ɪə	eə

eə	ɪə
eə	ə

aɪ	ɪ
aɪ	i
aɪ	eɪ

aʊ	uː
aʊ	ɒ

uː	ʊ
uː	ʌ
uː	ɒ
uː	aʊ
uː	əʊ

ʊ	uː

əʊ	uː
əʊ	ə

ʌ	uː
ʌ	ɒ
ʌ	ə

ɔː	ə
ɔː	ɜː
ɔː	ɒ
ɔː	ɑː

ɑː	ɔː

ɒ	uː
ɒ	ɔː
ɒ	ʌ
ɒ	aʊ

5.3 Discussion

The result was similar to Zwicky (1976)'s analysis: for most of the pairs, the difference is only one feature. In addition, we revealed how diphthongs, schwa, and /ɜ/ behave when they are used in a consonance pair: the rule that is applied to monophthong pairs is also applied to the second element of diphthongs, and to the [place] feature of /ɜ/ and schwa. As for *i* and *u*, their specification of [tense] feature is copied from another vowel in a pair. Details are discussed below.

5.3.1 Monophthongs and Diphthongs

Monophthongs (except schwa and /ɜ/) and diphthongs are vowels marked as [+place]. These vowels, when used in consonance, can be paired together as long as their difference is no more than one phonological feature. (We henceforth call this rule, referring to Zwicky (1976), "the one-feature-

apart rule".) When diphthongs are used, it is the secondary segment that is restricted under this rule. Here are some examples:

/ɪ/ – /e/ e.g. chapleted – head

Difference in features: [+high] – [-high]

/iː/ – /eɪ/ e.g. beat – Grate

Difference in features: [+tense] – [-tense]

/ɪ/ – /aɪ/e.g. wind – blind

Difference in features: None

/aɪ/ – /eɪ/ e.g. dies – ways

Difference in features: None

Note that in the second example, the secondary segment ɪ of /eɪ/, not the primary segment e, follows the one-feature-apart rule when /eɪ/ is coupled with /iː/. Features of a primary segment are irrelevant to whether a diphthong can form a pair with another vowel to be paired. Also note that as in a pair involving diphthongs, there could be no feature difference between a monophthong and the secondary segment of a diphthong (as in the third example), or between the secondary segment of diphthongs (as in the fourth example). This does not violate the one-feature-apart rule, since the rule states that the difference should be *less than* one, not that there *should be* one feature difference.

There were, however, some examples that do not follow this rule. The followings are exceptions, which have more than one feature difference:

/ʌ/ – /uː/ e.g. blood – food

Difference in features: [-high] – [+high]

[-tense] – [+tense]

[-round] – [+round]

/ɒ/ – /aʊ/ e.g. not – mouth

Difference in features: [-high] – [+high]

[+low] – [-low]

/ɒ/ – /uː/ e.g. of – approve

Difference in features: [-tense] – [+tense]

[-high] – [+high]

[+low] – [-low]

For some reason, those exceptions all involve back vowels, and /ɒ/ appears in 2 out of 3 cases. It is unknown whether this is by coincidence (due to a small number of samples collected in this study), or there is some reason for back vowels to override the general rule; we were unable to reach a conclusion.

5.3.2 Schwa and /ɜ/

Schwa and /ɜ/ are vowels marked as [-place]. These vowels, when used in consonance, can be paired with any vowel. Here are some examples:

/ə/ – /e/ e.g. miracle – well

/ə/ – /əʊ/ e.g. invention – alone

/ɜː/ – /ɔː/ e.g. earth – forth

/ə/ – /ɜː/ e.g. miniver – fur

Schwa and /ɜ/ can be coupled with any [+place] vowels (the first, second, and third example), or with any [-place] vowel (the fourth example). None of the examples violate the one-feature-difference rule, because the first three cases have one feature that is different, which is [place], and for the last case, the number of different features is zero.

5.3.3 /i/ and /u/

/i/ and /u/ are vowels with no [tense] specification. When they are used in consonance, their [tense] specification seems to be copied from their counterpart: if they are paired with [+tesne] vowel, they obtain [+tense] specification and become /iː/ and /uː/ retrospectively, and vice versa. Here are some examples:

/i/ – /iː/ e.g. Dorothy – see

/i/: [ø tense] → [+tense] – /iː/: [+tense]

/i/ – /ɪ/ e.g. lilies – is

/i/: [ø tense] → [-tense] – /ɪ/: [-tense]

/i/ – /aɪ/e.g. fixedly – apply

/i/: [ø tense] → [-tense] – /aɪ/: [-tense]

/i/ has no [tense] specification, which means it can be both [+tense] or [-tense]. When used in a rhyme, it acquires [tense] specification to match its counterpart's feature. Thus, in cases like the first and the second example, a consonance pair becomes a perfectly rhyming pair after /i/ has fully obtained its features. When read aloud, in *Dorothy* – *see*, a reader has to adjust the "length" of /i/ to /iː/ in order to match the "length" of *see*. It is only cases like the last example that are truly consonance pairs. This might sound contradictory – if the first and the second case are a perfect rhyme, then why should we view them as consonance? The answer is, in a typical perfect rhyme,

which is defined as a perfect agreement of vowel (and consonants), /i/ can only be paired with /i/, with their [tense] feature both unspecified. *Dorothy* can only be paired with, say, *Mary*, *lilies* with *cherries*. By contrast, /i/ paired with /iː/ or /ɪ/ is not a perfect match; thus, we classified such cases as consonance.

6. Conclusion

Consonance is a sub-class of rhyme that has the same coda and a similar but mismatching nucleus. However, not much research have been conducted on to what extent a vowel in a nucleus should be similar to function as a consonance. Zwicky (1976) states that vowels used in consonance must be "one feature apart". Okazaki (2014) suggests that vowels used in consonance correspond to a vowel alternation observed in suffixation, and argues that they must be underlyingly a perfect rhyme. Although the previous studies provide important insights into a characteristic of consonance, they come with problems. Zwicky (1976) has not clarified the details of a feature system referred to in the work, and also does not mention how diphthongs, schwa, and /ɜː/behave in consonance. Okazaki (2014)'s analysis unfortunately comes with some flaws. Therefore, we conducted a similar analysis as Zwicky (1976) with a finer definition of feature systems.

In this research, we chose Hopkins as the subject of the case study, and collected data from *Gerard Manley Hopkins* (The Oxford Authors series), a collection of works by Hopkins. After reading through the first 100 pages and figuring out the rhyming pattern of each poem, we regarded pairs that are supposed to rhyme perfectly following the rhyming pattern but have different vowels as consonance pairs. After data was collected, we used LPD to check their pronunciation. Lastly, we compared the phonological features of each vowel, using a modified version of Giegerich (1992)'s feature system.

The result was similar to Zwicky (1976)'s analysis, showing that the maximum difference between the vowel used in consonance is one phonological feature. Our research also exemplified that the same rule can also be applied to diphthongs, schwa and /ɜː/ if we interpret diphthongs as a

sequence of two sound segments, and schwa and /ɜː/ as having a [-place] specification, contrasting with the rest of the vowels which are specified as [+place].

It has to be admitted that our research leaves plenty of room for improvement. One of the major issues is that our analysis ignores the possibility of historical rhymes, conventional historical rhymes, and eye rhymes. In historical rhymes, a pair of words that once used to rhyme perfectly but are now pronounced with a different final nucleus. Some poets employ historical rhymes even if vowels are pronounced differently at the time of composition (Wyld, 1965, p. 11). These are called conventional historical rhymes. In eye rhymes, a poet uses a pair of words whose final nucleus does not sound identical at all, but has the same spelling, such as *love – prove*. These types of rhyme are indistinguishable from pure consonance, and might be mistakenly listed in this research.

Further research is needed to prove whether the "one-feature-apart rule" also applies to other poets and lyricists, or looser constraint is used by some writers. In addition, the number of samples must be increased to draw a firmer conclusion; there were only 68 instances of consonance collected in this research, which might not fully reflect the character of consonance used by Hopkins. Lastly, we have not yet proven how the "one-feature-apart rule" contributes to a rhyming effect, a rhythmic effect created by a repetition of sounds. Although it can be inferred that the closer the features are, the more similar they are to one's ear, for many speakers of English, pairs such as /ɒ/ – /ɔː/ might sound too distinct to function as a rhyme.

As Okazaki (2014) points out, the relationship between rhymes and phonology seems to be one of the least studied areas. Further research on this topic is anticipated.

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