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Characteristics and Constraints in Ballads and Their Effects on Memory

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Four sets of ballads, chosen as a sample of an oral tradition as it existed in North Carolina in the early 1900s, were examined in order to determine whether ballad characteristics used in combination are sufficient to account for the stability observed from performance to performance, as well as across generations of oral transmission. The characteristics included verse length, presence of refrains, presence and location of poetics, the pattern and number of end rhymes, the metrical patterns, average number of syllables per word, the pattern of meaning and imagery in lines, the frequency of repeated lines both within and across ballads in the set, the musical scales used, and the agreement of metrical stresses and musical beats. The combination of these characteristics provides many constraints which limit the possible word choices and can act to stabilize transmissions.

Ballads are a predominantly oral tradition passed from generation to generation, which means that they must rely on human memory for their preservation. In oral transmission experiments (Allport & Postman, 1947; Bartlett, 1932), stories changed such that, in a few transmissions, the beginning and ending story were very different. This holds for stories out of cultural context, such as "War of the Ghosts," as well as for stories in the cultural context, such as descriptions of a bomb explosion at a train station, a cricket game, a scientific argument, and a pictoral scene. However, in contrast to these oral transmission experiments, ballads have not changed greatly over generations.

A comparison of the Child and Brown collections illustrates the stability in ballads. Between 1882 and 1898, Francis J. Child collected English and Scottish ballad texts from sources dating from the 14th to the 19th centuries and identified 305 texts which he determined were authentic ballads collected by oral means from folk singers (Child, 1882–1898). Child's versions, titles, and ballad numbers have subsequently become a standard reference. Between 1912 and 1944, Frank C. Brown, with the help of colleagues, friends, and students, collected 900 ballads and folk songs from singers in North Carolina. Among these 900 songs are 49 ballads from the Child collection. Thus at least these 49 ballads

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have survived oral transmission for over one hundred years. Some of these songs are still sung today by North Carolina ballad singers.

There is no question after examining the 49 ballads in Brown's collection that they tell the same story and are variants of Child's ballads, even though Brown's versions are not *identical* to Child's versions. This observation is in direct contrast to Bartlett's experiments on serial transmission. Bartlett (1932) found that subsequent versions differ so much from the original that one would not be able to link the original with the end product without the benefit of each transmission along the way. This is not to say that deviant versions never occur, but rather that many times, as evidenced by the number of versions collected from different sources, the ballad has been transmitted at least over a century without great distortions in the text.

Why, then, do ballads remain relatively unchanged over many transmissions when other material does not (e.g., Bartlett, 1932; Allport & Postman, 1947)? We suggest that ballads are stabilized by the common characteristics they share and by the specific characteristics of an individual ballad (Wallace & Rubin, 1988b). Several mechanisms can improve recall. First, the chances of a singer correctly recovering original words that were distorted in transmission or guessing an unknown word are increased. Second, the many forms of organization also act as multiple-retrieval cues. Third, characteristics chunk portions of the ballad and provide additional memory associations so that recall of one portion increases the likelihood of recalling other portions. The presence of any one characteristic provides some stability for memory, but the combination of characteristics is much more effective (Rubin & Wallace, 1989).

The presence, or at least the transmitter's knowledge, of such multiple constraints distinguishes the ballads from the materials used by Bartlett (1932) and Allport and Postman (1947). Rumor materials do not appear to have characteristics that constrain to the same extent as is found in the ballads. For example, rumors lack clear poetic and rhythmic structure. In addition, there is not a corpus of rumor material that accentuates whatever characteristics are present to the transmitters of the material.

This article attempts to examine in detail the forms of organization present in one oral tradition to see if that organization is capable of supporting the recall stability that has been observed.

Although ballads have remained stable over several generations, versions are not verbatim reproductions of one another; performances do vary across and within singers. For example, five traditional singers performed a more recent ballad, "The Wreck of the Old 97," on two occasions (Wallace & Rubin, 1988b). None of the performances, either across singers or by one singer, were identical.

What is stable across ballad performances are the characteristics and constraints. Each performance of "The Wreck of the Old 97" told the same essential story. Singers usually maintained the same end-rhyme sound across performances of the same verse. Words that were strongly poetically linked to other words within a line typically did not change across performances. Verses not present in all performances were usually those that added details or gave a setting rather than those that told the essential events in the story. The musical notes sung on the quarter beats of each measure typically did not vary across performances. The verse and beat structure did not change across performances. However, within these constraints, the particular words and phrasing did vary. The same results were found when one singer's performances of several ballads were examined, even when these included some of Child's older ballads (Wallace & Rubin, 1988a).

Not only do singers show evidence of preserving these characteristics across performances, but they also incorporate characteristics when generating a new ballad (Wallace, 1991). Singers have no trouble producing a new ballad when given a newspaper article as the basis for the ballad. On average, singers produce a 16-line ballad in 12 min, including time to read the article. The ballads produced are unique and are not the result of piecing together parts of songs just performed. These created ballads share common characteristics with other similar traditional ballads. For example, the created ballads incorporate the common rhythmical structure, rhyme scheme, and verse structure. In addition, the created ballads use typical meaning structures as other ballads about the same theme. The consistency of the created ballads indicates that singers do have some knowledge about the characteristics typically found in ballads.

Finally, at least some of the ballad characteristics can improve recall of undergraduates who are not familiar with the ballad tradition. For example, undergraduates have better verbatim recall of lines that have a stronger agreement with the metrical pattern, are more causally connected in the ballad, and convey the most imagery for the ballad (Wallace & Rubin, 1988b). In addition, when undergraduates learn a ballad verse in which the poetic constraints have been broken by substituting a nonpoetic synonym, verbatim recall is lower than recall of the original poetic version (Wallace & Rubin, 1988b). That is, subjects are more likely to recall the designated word pair, heard within the verse, verbatim when the poetic constraints are present than when those constraints are missing. In the nonpoetic case, subjects will recall the gist of the word pairs but not the verbatim word pair. Thus, even for subjects who are not familiar with the tradition, the presence of some characteristics can improve verbatim recall.

Thus, from naturalistic observation and laboratory experiments, it is known that the characteristics contribute to the stability of ballad recalls. These data are based on constraints found in a few ballads. If the claim that multiple constraints increase stability is to be generalized, then what is needed is a thorough examination of the extent to which these constraints are present in a ballad corpus, not just the extent to which a few characteristics of interest are present in the stimuli examined thus far. If enough constraints are present within the corpus to account for the degree and kind of stability found thus far, then claiming that multiple constraints increase stability of the ballad tradition over generations of transmission is feasible. To this end, this article determines the extent to which ballads conform to common characteristics and considers the constraints imposed by such characteristics, as well as the impact such constraints should have on ballad recalls.

First, the set of ballads to be investigated are described. Four sets were chosen so that each set should have decreasing constraints present within the set. Second, each set is tested for the commonality of many characteristics in order to determine (a) how unified each set is, (b) if the sets differ from each other, and (c) the extent of the resulting constraints imposed by those characteristics. The characteristics to be considered include structural components such as verse length, presence of refrains, presence and location of poetics, the pattern and number of end rhymes, the metrical pattern, average word length, and the pattern of meaning and imagery in lines as well as some thematic and musical components. Third, the impact of the characteristics, individually and in combination, on memory will be considered.

THE BALLADS

The Frank C. Brown collection, edited by White (1952–1962, Vol. 2), provided the ballads to be examined. This source is ideal for several reasons. First, Brown kept multiple versions of the same song, which allows for a comparison of variants at one time in history. Second, because Brown retained all authentic oral ballads that he found, the collection reflects the ballad tradition as it existed at one time. Third, the collection centers on the singers of North Carolina and thus provides a coherent tradition that can be compared to current versions of these ballads from the same area. Some of the singers in the Brown collection have sons and daughters who are still performing the songs as learned from their parents. Fourth, the original papers are in the Duke University archives and are available for further examination in cases where the full text is not given in the published version.

From the Brown collection, four sets of songs were identified: all versions of "Barbara Allen," all train wreck and shipwreck songs, the most popular ballads, and the most popular folk songs. These four sets provide decreasing constraints. "Barbara Allen" is one ballad, the wreck songs are all ballads involving a single theme, the popular ballads involve several themes, and the folk songs include all songs that were not classified as ballads. Ballads are songs which describe or imply some action; in contrast, folk songs contain an expression of sentiment (White, 1952–1962, Vol. 2).

All versions of "Barbara Allen," the most frequently collected ballad, were included. When a version was not published in full, the original text was recovered from Brown's archival papers. There were 32 versions of this song. This set allowed examination of the properties or constraints operating within one song.

All ballads containing stories with a train wreck or shipwreck were selected. This particular theme was chosen because (a) the theme was easily identifiable, (b) the set including these songs was of manageable size, (c) the songs in this set are intermediate in time of creation between 1800s and 1940s and thus represent the tradition as it existed at the time of the collection, and (d) one of the initial singers from whom we collected preferred these songs. All versions of songs with this theme which were published in full were included because the editors published full texts when other versions were sufficiently different from the first version given. Twenty-two unique ballads and 39 versions published in full contained this theme. The set includes one song from the Child's collection ("The Sweet Trinity"), as well as more recent ballads about train wrecks. This set allowed a comparison between properties of ballads in general and properties of ballads that are more closely related in content. One might expect thematically related ballads to share more characteristics than do ballads in general.

Finally, the most popular ballads and most popular folk songs were included, with popularity defined by the number of times the ballad or song was collected. Since Brown did not exclude versions of a ballad because another version existed, the popularity of the songs during the time he was collecting is roughly preserved. Ballads and folk songs were selected for inclusion if seven or more occurrences were given in Brown's collection. The version printed in full, which had a printed musical score and was compared to other versions most often, was included in the set. There were 29 popular ballads and 22 popular folk songs. The popular ballad set contains one version of "Barbara Allen" and one ballad from the wreck set.

Thus the Brown collection provides a near perfect sample for our purposes. Complete texts of ballads are available, often with musical transcriptions. Further, the frequency of occurrence and variability of a ballad in the collection are good indicators of the frequency and variability in the North Carolina tradition between 1914 and 1944. Thus, the range of variation shown in "Barbara Allen" is representative of the range observed in normal transmission, the wrecks are the complete set of ballads collected on a given theme, and the popular ballads and folk songs are the most prevalent ones of their time. Properties found for these sets are therefore good indicators of the properties present in the tradition at one time.

Verse Length

The percentages of songs with verse lengths of two to eight lines are given in Table 1 (p. 186). Verse length was determined by counting the number of lines per verse as printed in the Brown collection; therefore, verse length was determined by experts who were accustomed to making such decisions. In all four sets, most ballads have four-line verses. The next most common verse lengths contain either five or eight lines. Five-line verses are achieved by either repeating line 4 for line 5 or by repeating the same line for the fifth line of every verse.

TABLE 1
Verse Length

	Percentage of Songs With Verse Lengths of:							
	2	3	4	5	6	7	8	Mixed
"Barbara Allen"	0.0	0.0	93.8	0.0	0.0	0.0	6.2	0.0
Wrecks	0.0	2.6	66.7	5.1	2.6	0.0	23.1	0.0
Popular Ballads	6.9	0.0	72.4	17.2	0.0	0.0	3.4	0.0
Popular Folk Songs	0.0	4.6	81.8	0.0	4.6	0.0	4.6	4.6

Eight-line verses in some ways look like two four-line verses combined; the rhythmical and poetic characteristics of lines 1 through 4 often repeat for lines 5 through 8. An eight-line verse can most easily be distinguished from a four-line verse by a melody that does not repeat exactly for the second four lines. More variations of the standard four-line structure occur in the newer wreck ballads, which may indicate a modern trend toward more complex variations of the four-line structure.

Even the exceptions to the four-, five-, or eight-line verses hint at a basic four-line substructure. Of the 2 two-line ballads, 1 has lines that are twice the length of other ballad lines and could be broken into four shorter lines. The other two-line ballad has an accompanying three-line chorus resulting in a five-line structure in which the last three lines are near repetitions of each other. The one wreck ballad with a three-line structure has an accompanying five-line chorus in which the first two lines of the chorus are identical, again emphasizing the four-line structure. Thus, for all songs examined, there are only 3 songs—1 two-line ballad and 2 six-line ballads—without a four-line verse structure or substructure.

The observation of the commonality of the four-line structure in ballads is not new; almost all folklore scholars have made similar comments (e.g., Bronson, 1969; Hendron, 1936; Sharp, 1908; Wells, 1950). The points to note here are that the tradition in North Carolina follows the same pattern, the pattern is very regular, and the pattern does not increase in regularity as one selects a more constrained set.

CHORUSES

Refrains are not typical for ballads (e.g., Hendron, 1936). No version of "Barbara Allen" has a refrain. Among the popular ballads, six (21 percent) have a refrain. Four of these six repeat the melody of the verse for the refrain. None of these six belongs to the Child ballads. When the verse has four lines, the chorus also has four lines.

In the wreck ballads, 21 (55 percent) of the versions (12 out of the 22 unique songs) have a refrain. Thus, for more recent ballads, refrains are more common, suggesting a change in the tradition. A four-line refrain is most common (68 percent). For two songs with eight-line verses, the refrain also has eight lines. However, four ballads with an eight-line verse have a four-line refrain.

For popular folk songs, about half (55 percent) of the songs have a refrain, with four-line refrains being most common (83 percent). Half of the songs repeat the melody of the verse for the refrain. Three songs create the refrain melody from a systematic variation of the verse melody. Folk songs are shorter and simpler; therefore, it is not surprising to find that these songs frequently have a refrain which contributes to the ease of learning and adds length to the song.

In Table 1 and for other succeeding measures, refrains are counted as if they occurred only once.

POETICS

The number of poetic links within a line were counted where a poetic link consisted of repeating, rhyming, or alliterating words. Only the sound of the word, not the meaning or the spelling, was considered. If a word repeated, the repetition was not counted as either a rhyme or alliteration. The accent used by the North Carolinians was considered as much as possible. For example, in North Carolina "pin" and "pen" are indistinguishable in sound. If these two words occurred in the same line, they would constitute one repetition even though the meaning is different. Where the accent of the singer was noted by the spelling in the text, this was considered. Plurals or possessives of a word were not counted as repetitions of the singular form. Hyphenated words were counted as two words when both halves constituted separate words. This step was undertaken to minimize deviations in the printed text. For example, in versions of one song, the term *death bed* randomly appeared as two words, one word, or a hyphenated word. The measures were completed by one person and checked by a second person.

Poetics links occur for about 17% of the words within a line. One average, 3% of the words in a line rhyme with another word in that line; 10% of the words alliterate with another word; and 4% repeat within the line.

Rhyme is more often found in popular folk songs (5% of words on a line rhyme) than in "Barbara Allen" or popular ballads (3% of words on a line rhyme for both sets); whereas, wrecks contain less rhyme (2%) than do the other three sets, F (3,3956) = 25.53[1]. All described differences among means are significant at $p < .05$ according to Scheffe post-hoc means comparison test, unless otherwise indicated.

In addition, repetition is more often found in the popular folk songs than in the other sets (7% versus 3%, 3%, and 3%), F (3,3952) = 39.10. Popular folk songs are more often sung by or to children; therefore, it is not surprising that these

[1]Because of the sensitivity of ANOVAs with *df* greater than (3,3000), a conservative F test was used. Only F ratios significant at $p < .05$ with (1,3980) *df* are reported in this article.

songs contain more repetition and more rhyme—both characteristics that children should be sensitive to, judging from counting-out rhymes (Kelly & Rubin, 1988).

There is also a significant difference in the percentage of repeating words found on different lines, $F(7,3952) = 20.01$. Lines 1 and 3 contain significantly more repetition (6% and 5%, respectively) than do the other lines (2% to 3%). In addition, there is a small but significant difference in the percentage of alliterating words found on different lines, $F(7,3951) = 5.54$ with line 3 having more alliteration than line 4 (11% and 9%, respectively).

In summary, about 17% of the words in each line rhyme with, alliterate with, or repeat the sound of other words within the line. Popular folk songs, which are more often sung to and by children, contain more rhyme and repeating sounds than do the other sets. Finally, looking across sets at the proportion of poetics on each line reveals that lines 1 and 3 contain more poetic links than do other lines. Poetics occur regularly and in particular patterns.

END RHYME

The end-rhyme pattern was identified by the pattern contained in more than half the verses for each song where end rhyme was exact rhyme and not near rhyme or assonance. Including both near rhyme and assonance would have made the patterns even stronger because end rhymes are often not exact rhymes. Table 2 gives the percentage of end-rhyme patterns for each set.

The most common rhyme scheme occurs at the ends of the even lines (referred to as 2-4 rhyme) for all sets. Almost all versions of "Barbara Allen" contain 2-4 rhyme.

Finally, the popular folk songs contain much more variety of rhyme patterns. These songs also have more lines that repeat within a verse, as well as between verses. In addition, if these repeating words had been counted as part of the

TABLE 2
Frequency of End-Rhyme Schemes for Each Set

	Percentage of Ballads With End-Rhyme Pattern on Lines:					
	2-4	**1-2 and 3-4**	**1-2**	**Varied**	**Other**	**None**
"Barbara Allen"	84.4	3.1	0.0	12.5	0.0	0.0
Wrecks	51.3	25.6	7.7	12.8	2.6	2.6
Popular Ballads	55.2	13.8	10.3	13.8	3.4	3.4
Popular Folk Songs	31.8	9.1	13.6	18.2	18.2	9.1

Note. For eight-line verses, the rhyme pattern for lines 1 through 4 repeats for lines 5 through 8.

rhyme pattern, then there would have been even more songs with rhymes at the end of every line.

Table 3 gives the common end-rhyme sounds for each set. For all sets, very few rhyming sounds account for most of the end rhyme. The most frequent end-rhyme sounds involve words that rhyme with "day," "me", and "by," which together account for 11.0%, 25.6%, 23.4%, and 27.1%, of rhyme pairs in "Barbara Allen," wreck ballads, popular ballads, and popular folk songs, respectively. For "Barbara Allen," most end rhyme (62.9%) occurs by rhyming "Allen" with "-ing" words or by rhyming "-ing" words. In addition, for approximately 1.6 verses in each variant of "Barbara Allen," lines 2 and 4 contain a near rhyme or assonance involving "him" and an "-ing" word. Although the "him . . . -ing" verses were not included in Tables 2 or 3, counting these verses as having a 2-4 rhyme would not have been unreasonable because one charac-

TABLE 3
Common End Rhymes

Rhymes With	Percentage of End-Rhyme Pairs					
	"Barbara Allen"	Wrecks	Popular Ballads	Popular Folk Songs	Average	Cummultive Average
win	62.9	0.0	3.8	4.9	17.9	17.9
me	3.3	14.5	9.2	15.6	10.6	28.5
day	7.7	6.7	8.2	3.3	6.5	35.0
no	9.9	1.3	6.0	2.5	4.9	39.9
by	0.0	4.4	6.0	8.2	4.6	44.5
do	0.0	8.8	4.9	1.6	3.8	48.3
led	0.0	4.0	1.1	6.6	2.9	51.2
more	0.0	4.7	1.6	3.3	2.4	53.6
wall	6.2	0.0	1.6	0.8	2.1	55.7
land	1.6	3.0	1.6	1.6	1.9	57.6
night	0.0	2.4	2.2	2.5	1.8	59.4
town	1.5	2.0	1.1	2.5	1.8	61.2
pa	0.0	0.0	0.0	6.5	1.6	62.8
near	0.0	2.0	3.3	0.8	1.5	64.3
hide	0.4	2.4	1.6	1.6	1.5	65.8
brier	5.5	0.3	0.0	0.0	1.4	67.2
part	0.0	0.3	3.3	1.6	1.3	68.5
gave	0.0	3.0	1.1	0.8	1.2	69.7
stir	0.7	0.0	0.5	3.3	1.1	70.8
cold	0.0	2.0	0.5	1.6	1.0	71.8
plain	0.0	2.7	1.1	0.0	1.0	72.8
Total Number of Rhyme Pairs:						
	272	297	184	122		
Total Number of Unique Rhyme Sounds:						
	12	68	69	50		

teristic of North Carolinian speech is a slurring of the final consonant in a word; thus, "nigh him" and "dying" can sound like rhyme if a North Carolinian is singing.

In summary, end rhyme occurs regularly and at particular locations within the verse. In addition, the number of rhyming sounds used is very limited, so that, on average, 72.8% of end rhyme occurs from the use of 21 rhyme sounds.

METER

The meter of each line was marked by a person with experience in identifying meter in poetry. The meter is a repeated pattern of stressed and unstressed units where the unit corresponds to a syllable. Each repetition of the pattern is called a foot. The four basic metrical patterns in English poetry are (a) u/ or iambic foot, (b) uu/ or anapestic foot, (c) /u or trochaic foot, and (d) /uu or dactylic foot, where / identifies a stressed unit and *u* identifies an unstressed unit (Hamilton, 1940). The following is an example of the meter in a ballad verse from the Brown collection:

u / u / u / u /
In Scarlet Town where I was born

u / u / u / u (/ as a rest)
There was a fair maid dwelling

u / u / u / u /
Made every youth cry 'Well-away'

u / u / u / u (/ as a rest)
Her name was Barbara Allen.

Verse 1 in version A of "Barbara Allen" from the Brown collection (White, 1952–1962, Vol. 2, pp. 111–112)

The meter for each line of each ballad was marked and the number of stressed units per line was counted. Finally, the predominant pattern for each song in each set was determined. Table 4 gives the frequency of each metrical pattern for each set. The predominant pattern for all sets is iambic. However, the wreck set contains a greater variety of metrical patterns than is found in either of the other ballad sets.

The metrical pattern can also be determined with a technique described by Kelly and Rubin (1988) in which accented syllables and monosyllabic nouns, verbs, adjectives, and adverbs are marked as stressed. When Kelly and Rubin's technique was applied to the first verse of each of the popular ballads, 79.6% of stresses marked by Kelly and Rubin's technique agree with stresses marked by the current technique. We choose to use the standard English technique because this method captures more of the stresses that occasionally occur on prepositions and pronouns in addition to indicating more rhythm and fewer stresses for a series of single-syllable adjectives and nouns.

TABLE 4
Metrical Pattern

	Percentage of Songs With Metrical Patterns				
	Iambic u/	**Anapestic uu/**	**Trochaic /u**	**Dactylic /uu**	**Varied**
"Barbara Allen"	100.0	0.0	0.0	0.0	0.0
Wrecks	53.8	20.5	12.8	0.0	15.4
Popular Ballads	85.7	3.6	7.1	0.0	3.6
Popular Folk Songs	72.7	0.0	13.6	0.0	13.6

In addition to the metrical pattern, ballads have two common meters: long and short meter. In long meter, each of the four lines has four stresses; whereas in short meter, the first and third lines have four stresses but the second and fourth lines have three stresses. The short meter can be extended to a long meter if there is a pause at the end of the second and fourth lines and this pause is counted as an unspoken stress (e.g., Bronson, 1969). The ballads in each set follow these patterns. As shown in Table 5, lines 2 and 4 are more likely to have three than four stresses; whereas the opposite is true for lines 1 and 3. This is consistent across all ballad sets. However, in the wrecks and in the popular folk songs, there

TABLE 5
Percent of Lines 1 Through 4 With 3 and 4 Stresses Per Line

	Line Number			
	1	**2**	**3**	**4**
"Barbara Allen"				
4 stresses	94.9	0.0	96.6	0.0
3 stresses	0.0	96.3	0.3	96.8
Other	5.1	3.7	3.1	3.2
Wrecks				
4 stresses	50.4	22.0	59.2	30.7
3 stresses	18.6	48.4	19.9	59.1
Other	31.0	29.6	20.9	10.2
Popular Ballads				
4 stresses	71.2	28.1	80.9	39.0
3 stresses	14.7	62.8	9.2	58.6
Other	14.1	9.1	9.9	2.4
Popular Folk Songs				
4 stresses	67.5	44.4	48.5	34.9
3 stresses	8.7	34.9	16.1	47.7
Other	23.8	20.7	35.5	17.4

are also more lines with neither 3 nor 4 stresses. In these cases the number of stresses vary between either 2, 5, 6, or 7 per line. Only lines 1 through 4 are reported because there are so few verses with more than four lines.

In summary, the ballads have a common metrical pattern. Lines 1 and 3 typically contain 4 stresses whereas lines 2 and 4 contain either three or four stresses. The pattern of stresses both within the set and within a verse is very regular.

NUMBER OF SYLLABLES PER WORD

Most ballad words are one syllable in length. Occasionally, words with three or more syllables are used; however, these are expected to be infrequent because they are more difficult to fit into the metrical pattern than are one- and two-syllable words. The mean percentage of two-syllable words per song for "Barbara Allen," wreck ballads, popular ballads, and the popular folk songs are 16.3%, 18.7%, 16.7%, and 19.3%, respectively; for three or more syllable words the mean percentages are 1.7%, 2.1%, 1.7%, and 0.9%, respectively. There are significant differences between sets in the percentage of two-syllable words, $F(3,116) = 2.78$, $p < .05$; however, the means for each set do not significantly differ from each other by a Scheffe test. There are also significant differences between sets in the percentage of three-syllable words, $F(3,116) = 3.40$, $p < .03$, in which the wreck ballads significantly differ from "Barbara Allen" by a Scheffe test.

In summary, most ballad words (80.6%) are one syllable in length, whereas two-syllable words account for an average of 17.8% of the words. Words with more than two syllables, which should be more difficult to fit into the metrical scheme, account for an average of only 1.6% of the words used in each set.

MEANING RATINGS

Five Duke undergraduates rated the meaning of each line and each verse in all four sets. Raters were instructed to give a "9" to the lines which were most important to the meaning of the story and a "0" to the lines which were not very important to the story. Raters were told that the ratings would represent the clarity with which a line would be transmitted so that a 9 would be transmitted with perfect clarity and a 0 would not be understood. Reliability across judges, as measured by Cronbach's alpha, was 0.81.

There are significant differences in meaning ratings across the line sequence within each verse, $F(7,4419) = 64.40$, and across the set, $F(3,4419) = 70.28$, as well as a significant interaction between line sequence and set, $F(21,4419) = 8.75$.

Overall, for the first four lines within each verse, lines 3 and 4 have significantly higher meaning ratings than do lines 1 and 2 according to a Scheffe test.

This same pattern also occurs within the last four lines of eight-line verses (i.e., lines 5 and 6 are low, whereas lines 7 and 8 are high on meaning.) Thus as a general pattern, the last two lines of each four-line group carry more of the meaning. The popular folk songs have significantly lower meaning ratings as compared to the other sets, according to a Scheffe post-hoc means comparison test. The interaction between set and line sequence is a result of the popular folk songs disrupting the typical line pattern. For popular folk songs, lines 1 and 3 carry more of the meaning for each verse. In addition, line 1 in the wreck ballads tends to have high meaning ratings. Table 6 gives the meaning ratings for each set by line. Buchan (1972) has claimed that lines 1 and 3 contain the essential ideas of the verse; however, this claim is not substantiated by the measures used here.

In summary, the ballad sets contain a regular pattern in which lines 3 and 4 carry more meaning than do lines 1 and 2. Furthermore, the popular folk songs contain more disruption of this pattern than is found in the other sets.

IMAGERY RATINGS

Using the same scale and similar instructions as for meaning ratings, the five raters were also asked to judge the imagery value of each line and verse. Imagery was defined as the ability of a line to evoke a clear picture of the event described by the ballad. Imagery was rated after all meaning ratings were completed in order to minimize the possibility that the same characteristics were judged as meaningful and imageful. Reliability across judges, as measured by Cronbach's alpha, was 0.80.

There is significant effect on imagery ratings of set, $F\ (3{,}4419) = 22.73$, and line sequence, $F\ (7{,}4419) = 14.76$. The wrecks have significantly higher imagery ratings than do the other sets, according to a Scheffe post-hoc means comparison test. Lines 1, 2, and 3 carry more of the imagery for each verse than does line 4, according to a Scheffe test. Furthermore, lines 5 to 8 have lower imagery

TABLE 6
Means for Meaning Ratings

	Line Sequence								
	1	2	3	4	5	6	7	8	*M*
"Barbara Allen"	2.90	3.31	4.53	5.22	3.86	3.53	5.00	5.20	4.00
Wrecks	3.73	3.34	3.73	4.16	3.58	3.60	4.43	5.03	3.78
Popular Ballads	3.38	3.04	4.27	4.58	3.83	3.35	5.04	3.55	3.80
Popular Folk Songs	3.60	2.25	3.94	3.05	3.66	2.83	4.00	5.00	3.23
M	3.33	3.12	4.18	4.53	3.73	3.51	4.61	4.94	3.80
N	1046	1044	1017	986	152	76	73	57	

ratings than do lines 1 to 4, in addition to not following the pattern of the first four lines. Mean imagery ratings for each line in each set are given in Table 7.

In summary, the ballads sets have a regular pattern in which the last line in the first four lines contains the least amount of imagery. In addition, popular folk songs contain the least amount of imagery among all the ballad sets.

THEMATIC PATTERNS

Describing the content of ballads is not easy because each ballad is a unique story, that is, each consists of a unique set of events. Nevertheless, some structures are shared across ballads. The first two shared structures to be considered are motifs and echoic verses.

Motifs refer to common phrases, lines, or events that are used in several ballads. Some examples of motifs are given in Table 8. There are many others, especially when all of the Brown collection is considered instead of just the popular ballads. In order to characterize the frequency of motifs, an independent observer indicated the proportion of lines for each ballad in each set that occur in other ballads within the same set. On average, 35.5%, 5.5%, and 5.0% of lines occur in another ballad in the wreck ballads, popular ballads, and popular folk songs, respectively. The proportion for the wreck ballads is an overestimate since all versions printed in full of a particular ballad were included. Just examining the 13 ballads with only one version yields an average of 2.2% of lines repeating in another ballad. "Barbara Allen" was not included in this measure because all ballads in the set are versions of the same song.

Echoic verses occur when two verses in sequence are nearly identical. This usually occurs when a question is asked and an answer given, when an action is requested and then occurs, or when two characters perform parallel actions. Some examples of these are given in Table 9 (p. 196). The percentage of lines that repeat within the same ballad was marked by an independent observer. The mean percentages of echoic lines for the wreck ballads, popular ballads, and

TABLE 7
Mean Imagery Ratings

	Line Sequence								
	1	2	3	4	5	6	7	8	*M*
"Barbara Allen"	3.72	3.99	3.16	2.85	3.08	2.92	2.07	2.16	3.39
Wrecks	4.05	3.80	3.74	3.39	3.40	3.75	2.25	2.79	3.65
Popular Ballads	3.10	3.28	3.47	3.31	2.35	3.65	3.25	3.90	3.23
Popular Folk Songs	3.20	2.85	3.36	2.32	3.09	2.58	4.33	1.67	2.95
M	3.58	3.61	3.42	3.05	2.88	3.48	2.37	2.67	3.38
N	1046	1044	1017	986	152	76	73	57	

TABLE 8
Examples of Verses That Occur in More Than One Ballad

Example 1: Rose and brier

From "Lord Lovel" (White, 1952, p. 87)
Lady Nancy was laid in the high church yard
Lord Lovel was laid in the tower
And out of her grave grew a red rose
And out of Lord Lovel's grew a brier

It grew and it grew to the church steeple top
It grew till it could grow no higher
There they twingled and twined in a true lover's knot
For all true lovers to admire.

From "Barbara Allen" (White, 1952, p. 117)
They buried him in one church yard
And Barbara in another
From his there sprang a red rose
And from hers there sprang a brier

They grew, they grew to the steeple top
Till they could grow no higher
They tied themselves in a true love knot
The wild rose and the brier

Example 2: White steed and dappled bay

From "Seven Sisters" or "Lady Isabel and the Elf Knight" (White, 1952, p. 17)
She mounted on the milk white steed
And led the dappled bay . . .

From "Sweet William and Fair Ellen" or "Earl Brand" (White, 1952, p. 28)
So he got on the snow white steed
And she on the dappled bay . . .

Example 3: Oh dig my grave

From "Lord Thomas and Fair Ellen" (White, 1952, p. 79)
Oh dig my grave oh dig my grave
And dig it wide and deep
Bury fair Ellen at my arms
And the brown girl at my feet

From "In Jefferson City" or "The Butcher Boy" (White, 1952, p. 273)
Oh dig my grave both wide and deep
Place a marble stand at my head and feet
And at the foot plant a cedar tree
To show the world I died for love of thee

popular folk songs are 19.3%, 24.3%, and 35.9%, respectively. There are no significant differences between these three sets in the percentage of echoic lines, $F(2,89) = 2.91$. "Barbara Allen" was not included in this measure because the

TABLE 9
Examples of Echoic Verses

Example 1: From "Black Jack David" or "The Gysie Laddie" (White, 1952, p. 162)

Oh say will you leave your house and home
And say will you leave your money
Oh say will you leave your husband and babe
And go with the Black Jack David

Yes I will leave my house and home
Yes I will leave my money
Yes I will leave my husband and babe
And go with my Black Jack David

Example 2: From "Lord Thomas and Fair Eleanor" (White, 1952, pp. 77–78)

O Mother O Mother come riddle to me
And riddle us both as one
And say shall I marry the fair Eleanor
Or bring the brown girl home

(6 verses later)
O Mother O Mother come riddle to me
And riddle us both as one
And say shall I go to Lord Thomas's wedding
Or tarry alone at home

ballads were all variants of each other; however, the first version cited in the Brown collection contains 5.6% echoic lines.

In addition to these shared structures, there are other ways to describe the progression of events within a single ballad including (a) a causal chain (Trabasso & Sperry, 1985), (b) the sequence of events that is typical for ballads or what will be referred to as a ballad script, and (c) the progression of events that uniquely defines a particular ballad. Although there are no quantitative measures that can describe how well these structures fit the ballad sets, the structures are described as potential constraints. The first and last of these structures operate at the individual ballad level rather than at the set level.

In a causal chain, B is said to be causally linked to A, if B could not have occurred unless A occurred, where A and B can be either lines, verses, or events. For example, in "George Collins," Mary's mother would not have asked Mary why she was weeping if George had not died. In such a framework, verses and lines that add commentary are not part of the causal chain. For example, again in "George Collins," the following verse is not part of the causal chain:

The blackest crow that ever flew
Will surely turn to white
If ever I prove false to my love
Bright days will turn to night.

Verses outside the causal chain are more likely to be omitted from performance to performance (Wallace & Rubin, 1988a, 1988b). Additionally these verses are likely to be motifs which occur in other ballads.

Ballad scripts refer to the typical events in ballads. These scripts may be general or more specific as in the wreck set. For example, ballads often tell a love story in which one person dies either from tragedy or murder. The remaining member of the pair then usually dies of sorrow or regrets contributing to the lover's death. These scripts are different from a restaurant script (Bower, Black, & Turner, 1979) in that one of several events can occur at a particular point. If restaurant scripts included all the possible events that usually occurred in various types of restaurants, then it would be similar to the type of script implied here. The wreck ballads provide an example of such variations. In wrecks, either (a) a main character, usually a train engineer or a ship captain, dies in an accident or battle; or (b) all passengers of the train or ship die in the accident. The ballad typically gives no details of the accident other than perhaps what was happening at the moment of the tragedy and concludes with a reference to the loved ones who are mourning. (See Wallace, 1987, for a more extensive discussion of wreck scripts.)

The progression of events that distinguish one ballad from another can also describe the story progression. These events are in essence what one would say if one were to tell what the ballad was about in its briefest form. These are also the specifics you could give to a ballad singer to determine if he or she knew the ballad. Many of the causal events would be included, although some would be implied by the ballad script and the logical sequence of events in the world. This is analogous to what a subject would say if he or she were describing something unusual that happened in a restaurant.

In summary, thematic material repeats fairly often within a ballad and less frequently across ballads. An average of 26.5% of the lines in each ballad repeat either in the form of a question and response, a request and an action, or parallel actions by two main characters. On the other hand, on average, 4.2% of the lines in each unique ballad occur in another ballad. Finally, other structures such as causal chains, scripts, and the progression of events can be used to further describe the organization of thematic material within the ballad.

MUSICAL SCALES

Musical scores, where these existed, are given in fourth volume of the Brown collection (White, 1952–1962, Vol. 4). For each score, the number of degrees in each scale and the range were indicated.

Although a musical score is based on a particular scale with seven degrees plus and an eighth degree equal to the octave of the tonic, not all songs employ all the notes of the scale. In medieval times, scales contained five notes, not seven as are found in the modern diatonic scale or twelve as in the chromatic scale. A song is called pentatonic if only five of the seven notes in the diatonic scale are employed in the song; a song is called hexatonic if six out of the seven notes are employed. In all cases, no accidental notes or notes not belonging to the scale are employed.

The range of notes used in a ballad can be classified into one of three groups: plagal, authentic, or mixed. When the notes of a musical score fall between the tonic and its octave (or occasionally one note above the octave), the song is said to be authentic in range. On the other hand, if the notes of the musical score fall between the fourth degree below the tonic and the fifth degree above the tonic (e.g., G to G-octave in the key of C), the range is called plagal. Finally, the range is mixed if the notes of the musical score fall between the fourth degree below the tonic and the octave above the tonic (e.g., G below middle C to C-octave in the key of C). The mixed-range class is Bronson's distinction and is adopted here (Bronson, 1944, 1969). Table 10 gives the frequency of each scale type and range for each set.

The ballads are approximately equally split between pentatonic, hexatonic, and diatonic scales and between authentic and plagal ranges. "Barbara Allen" ballads do tend to share the same scale and range.

CORRESPONDENCE OF MUSICAL BEATS AND METRICAL STRESSES

One of the constraints that music should impose on the text is to emphasize the stressed syllables from the text. In order to test this hypothesis, for the first verse of each song with a printed musical score, the percentage of stressed syllables from the marked metrical feet that fell on the first or middle note of each measure

TABLE 10
Musical Characteristics for Ballad Sets

	Ballads[a] in			
	"Barbara Allen" (n = 18)	Wrecks (n = 19)	Popular Ballads (n = 29)	Popular Folk songs (n = 22)
Scale Type				
Diatonic	5.6	36.8	27.6	31.8
Hexatonic	5.6	31.6	27.6	31.8
Pentatonic	88.9	26.3	41.4	22.7
< 5 degrees	0.0	5.3	3.4	13.6
Scale Range				
Authentic	0.0	31.6	37.9	27.3
Plagal	83.3	42.1	34.5	68.2
Mixed	16.7	26.3	27.6	4.5

[a]Using only those ballads in each set for which music existed.

was counted. The stressed syllables from the metrical feet were marked without knowledge or exposure to any ballad's musical score and thus form an independent measure of the stress that occurs in the text alone. The first and middle notes of a musical measure are the most accented notes in the measure and have been used in describing ballad melodies (e.g., Bronson, 1969). First and middle notes are, for example, the first and third quarter note in a 4/4 time signature or the first and fourth eighth note in a 6/8 time signature. The first verse was used because only the first verse was printed with the musical score and therefore exactly where each syllable fell can only be determined for the first verse.

There was good agreement between the stresses in the text and the stresses in the music. For "Barbara Allen", wreck ballads, popular ballads, and popular folk songs, 89.3%, 83.6%, 83.1%, and 85.9% of stressed syllables fell on the first or middle notes of the musical score, respectively. Most disagreements between text and musical stresses occurred for one of two reasons. First, in a 3/4 time signature, the stresses fell on the first and third quarter notes rather than on the first and middle notes of each measure. The former pattern accentuates one stress more than the other and results in a more rhythmical pattern. Second, some songs have twice as many stresses per measure as others; thus, instead of two metrical stresses per musical measure, there were four. Such cases usually occur in a 2/4 time signature in which all notes were eighth or sixteenth notes rather than quarter notes.

In summary, the text stresses and the musical beats constrain each other so that on average 85.5% of the stressed syllables, as determined by the metrical feet, fall on the first and middle notes of each measure which are the most accented notes in each measure.

DISCUSSION

There is a clear pattern for ballads. The typical ballad has the following characteristics: (a) 4-line verses with no chorus; (b) end rhyme at the ends of lines 2 and 4 with occasional assonance, alliteration, and rhyme within the lines; (c) four feet per line where a foot consists of an unstressed followed by a stressed syllable; (d) a vocabulary consisting mostly of one-syllable words; (e) the meaning being carried predominantly by the last two lines in the verse, whereas imagery is carried predominantly by the first three lines of the verse; (f) approximately 20% of the lines are echoes of other lines within the ballad and 5% are lines used in other ballads, and (g) strong agreement of musical and textual stresses. All variants of one song, "Barbara Allen," are more similar on the characteristics considered than are ballads in general. Finally, folklorists are correct in separating ballads from folk songs because folk songs are less consistent with the typical ballad pattern in that they employ more choruses, more rhyme, more repeated sounds, greater variety of rhyme patterns, and less meaning and imagery per line than do the other ballad sets.

The common properties among ballads result in several advantages for per-sons trying to remember the ballads. First, the common forms can serve as multiple associations that link words together in memory. Second, singers can use these common forms as a guide in trying to recover forgotten or distorted lines. There is anecdotal evidence that the latter could occur on some occasions. When singers are trying to increase their repertoire, they will visit a particular ballad singer and ask that singer to perform a few songs. The teacher usually only does a single song once or twice. The learner then reports going home and trying to put the ballad together. The learner may be relying on pattern knowledge about ballads in general to recreate the ballad they have just heard, to fill in lines they do not recall exactly, and to rehearse the learned ballad. Occasionally a learner will return to the original singer and ask that singer about a particular line or verse as if to check that the reconstruction has been done accurately.

The mere presence of common patterns is not their full power. Rather, the interaction of these forms is what is most powerful in stabilizing ballads over generations. Imagery and meaning properties are one example. The pattern for imagery is exactly the opposite of that for meaning. The last lines of the verse contributed most to the meaning whereas the first lines contribute most to the imagery. Thus, meaning helps to constrain the last portion of a verse and imagery helps to constrain the first portion of a verse. The first lines of a verse set the image or picture of the scene, whereas the last lines give important information. Furthermore, the two halves are connected by rhyme. Although meaning preserves the important points or actions, imagery integrates the points into a whole. One traditional singer reported, when asked what she did to try to learn ballads, that she had to first learn the image of the ballad and the progression of events, then learning the words was easy. This was also her advice to a young singer who was present at the interview and was trying to learn ballads.

Imagery should be particularly effective for ballads because most verses contain concrete events (Havelock, 1978) and imagery is most effective for concrete processing (Paivio, 1971). Furthermore, imagery should integrate the lines and verses into a single, although atemporal, representation which does not preserve the sequence or exact words. However, these problems can be dealt with by other characteristics. The properties of the meaning structure that contain causal relations preserve the sequence of events. To the extent that scripts for particular types of ballads exist, these should also preserve the verse sequences and the main events as well as indicate what type of additional, descriptive verses could be incorporated. Rhyme, alliteration, repeating sounds, rhythm, and verse structure help preserve the exact wording.

The poetics and rhythm in combination with imagery and meaning of the verse act to preserve the exact words by limiting possible word choices that could fit all these constraints. For example, knowing that a word describes a weather condition, rhymes with *know*, and is one syllable limits the choices to one word (Rubin & Wallace, 1989). If a singer knew all those constraints, he or she could guess the word and show verbatim recall on every trial. The average ballad has about 17% of the words in each line poetically connected to some other word in the same line, not counting end rhyme or other poetics across lines. As some words within the line are specified by poetic constraints, then rhythm, meaning, and other constraints further limit the choices for the remaining words. Not only do these characteristics limit possible word choices, but they make the likelihood of recalling the original word greater by providing so many cues, associates, or links to aid in retrieving the original wording.

End rhyme not only limits the words that occur at the ends of lines but can also have an effect on the order of lines. For example, after interviewing a singer, one of the authors was trying to recall a song just heard. The last two lines of a verse were recalled first, probably because most of the meaning was carried in those lines. At the end of these two lines, it became apparent that a rhyme was required for the last word. After recalling the rhyming words, the appropriate line order became apparent. Recalling the rhyme pair cued the appropriate line sequence. In addition, rhyming words are limited by length, sound, and stress pattern and thus can provide a powerful anchor for a verse.

Furthermore, knowing the rhythmical structure and having a specified number of stresses per line and a specified number of lines limits the length of each line and each verse. The specific words for each line are further limited in the stress patterns that will match the particular rhythmical information.

Finally, having the text's rhythmical structure tied to the musical structure reinforces the rhythm and limits changes in the rhythm. In addition, this connects the text with the melody, which probably results in even stronger cues for recall of the text. As anecdotal evidence of this effect, singers report, when asked what they do to prepare to sing another ballad, needing to get the melody or rhythm "in their head" before they can recall the text.

Not only do the characteristics constrain and stabilize the ballad, but in addition they provide a chunking mechanism. The rhythmical pattern groups word pairs or phrases into metrical feet. The melody and the number of stresses per line group the metrical feet. The location of rhyme at the end of every other line chunks two lines together. Verses that echo the same idea are also grouped. Causal relations or story sequences chunk verses into sequences of logical actions or events. Meaning patterns group the last two lines of the verse and, with imagery, group lines into a verse. Imagery groups the first lines of a verse as well as grouping verses into a single image.

Prior experiments indicate that the identified characteristics make an important contribution to stable transmissions. Ballad singers have more stable transmissions when characteristics such as poetics and musical beats are present (Wallace & Rubin, 1988a, 1988b). Singers know characteristics sufficiently to use them not just in guessing a word but in producing a new ballad (Wallace, 1991). Furthermore, a novice of the tradition has greater stability when characteristic poetics, imagery, and metrical pattern are strong (Wallace & Rubin, 1988b). This article shows that these characteristics occur with enough regularity to be of use in stabilizing the ballad corpus and not just in stabilizing isolated lines or verses.

The well-specified characteristics of ballads are effective devices for stabilizing memory across a person's life and across generations. These devices work by organizing, chunking, and constraining the words, as well as providing multiple links to aid recall. As a result, possible alternative phrasings and distortions are limited. Furthermore, with knowledge about the characteristics, a singer has the potential to reconstruct or guess a forgotten or distorted line. To the extent that these characteristics are passed from generation to generation, then the tradition should remain stable over time without having to remain fixed.

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