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Do children's rhymes reveal universal metrical patterns?¹

Introduction

Back in the middle of the twentieth century Rumanian ethnomusicologist Constantin Brailoiu (1984 [1956]) and American linguist Robbins Burling (1966) independently uncovered evidence showing that children's rhymes around the world have strikingly similar metrical patterns and speculated that these may indeed be universal. The first section of this article will review the Brailoiu and Burling models as well as more recent work by Hayes and MacEachern (1998). A revised version of a Hypothesis of Metrical Symmetry (HMS) for children's rhymes, first formulated in Arleo (1997), will be presented in section 2 and then tested for two genres of children's rhymes, English and French counting-out rhymes and English jump-rope rhymes, in section 3. In the conclusion I will offer several explanations as to why symmetry should play such an important role in oral traditions and will place the metrics of children's rhymes in a broader perspective, involving the study of isochrony in language.

Before proceeding to the first section of the paper, it is necessary to clarify the meaning of the terms *universal* and *children's rhymes*. As Brown (1991) has shown, the notion of universals has often been controversial, especially in anthropology, where cultural relativism reigned during much of the twentieth century. Brown discusses various types and degrees of universality, including formal versus substantive universals, absolute versus near universals, implicational universals (i.e., if a language has feature A, then it will have feature B) and statistical universals. The Hypothesis of Metrical Symmetry that will be presented below falls mainly in this last category, that is, it involves tendencies rather than absolute laws. Furthermore, universals research does not deny cultural or linguistic diversity, but aims to define the necessary conditions for understanding what is truly different in each culture or

¹ This is a revised version of a paper presented at the Atelier Stylistique et poétique at the Xle Congrès de la Société des Anglicistes de l'Enseignement Supérieur, Université d'Angers, May 19-21, 2000. I wish to thank the participants in this workshop for their comments as well as Jenna Tester for her assistance.

language. There is an obvious analogy with biology, where the genetic code underlies tremendous biological diversity. Thus the search for universals in children's rhymes, while emphasizing cross-cultural and cross-linguistic similarities, is in no way an attempt to standardize the rich and diverse traditions around the world.

The second term, children's rhymes, is often used in a confusing way to refer both to rhymes performed by adults for children, what I. and P. Opie (1959) call *nursery lore*, and rhymes performed by children for children, that is, part of *children's folklore* or *childlore*. This paper will argue that when investigating metrical patterns, nursery lore and childlore should not be lumped together, even though there is much overlap between the two. Some specialists of adult literature might wonder why anyone would even bother studying childlore and children's rhymes. This attitude is what play specialist Sutton-Smith (1970) has termed the "triviality barrier", the notion that children's play and folklore is trivial and undeserving of serious academic study. There are however many good reasons for studying childlore. For the linguist, children's verbal folklore is part of language, belonging to a "dialect of childhood" that is used by a substantial part of the world's population, that is, children from roughly four to twelve, and remembered by adolescents and adults. Furthermore, as Jakobson and Waugh (1980: 264-268) have pointed out, although the verbal art of the child and of the adult are different, they form a continuum, making the study of children's rhymes a branch of poetics. Childlore also has an obvious value for psychologists: Piaget (1969 [1932]), for example, observed marble playing in order to study the development of moral judgement in childhood. Finally, childlore is part of the whole culture and is often alluded to in literature, headlines, and advertising, as well as in everyday conversation. Therefore, some familiarity with children's folklore is surely useful for foreign language students, and especially foreign language teachers working with children.

1. The hypothesis of universal metrical patterns in children's rhymes: a review of previous studies

1.1. Brailoiu (1984 [1956])

We now move on to the main topic of this article, the hypothesis that there are universal metrical patterns in children's rhymes. Our story begins in the 1956 with the publication of a paper by Constantin Brailoiu in which he claimed that children's rhythms ("la

rythmique enfantine”) constitute an immediately recognizable autonomous system that is “spread over a considerable surface of the earth, from Hudson Bay to Japan” (Brailoiu 1984 [1956]: 207). Furthermore, “children’s rhythms are based on a restricted number of extremely simple principles”, which are “constantly concealed by the resources (almost unlimited here) of variation.” (ibid., 209). Brailoiu describes what he calls “series” of syllables, which generally correspond to lines. The most frequent series is the equivalent of eight short syllables, that is, in musical terms, quavers (British English) or eighth notes (American English).² Example 1 shows lines from various language of the “series worth eight”:

- (1a) J’ai pas-sé par la cui-si-ne (French)
- (1b) Ques-ta ro-sa e Ma-ri-et-ta (Italian)
- (1c) Wenn du willst e’n Gaul be-schla-gl (German)
- (1d) I-pu-tuy-or-ti-gu-wa-ra (Eskimo)

The series worth eight does not necessarily comprise eight pronounced syllables. In example 2a each line has seven syllables, but a total duration of eight eighth notes. In example 2b the third line has six syllables, but also a total duration of eight eighth notes.

- (2a) Eeny meeny miny mo,
Catch a tiger by the toe,
If he hollers, let him go,
Eeny meeny miny mo.

(personal recollection, New Jersey, ca. 1960)

- (2b) Eeny meeny miny mo,
Put the baby on the po,
When it’s done, wipe its bum,
Eeny meeny miny mo.

(Webb 1983, recorded in Workington, Cumberland, England in 1960;
cf. Abrahams 1969: 63)

In his conclusion Brailoiu states that children’s rhythms are governed by “strict symmetry” and suggests that “the system proceeds, if not from dance, then at least from ordered movement, which is closely associated with it.” He notes that “it remains to be seen how the most diverse languages manage to bend themselves to its inflexibility”, a task that can only be accomplished by collaboration between researchers “as numerous as the languages themselves” (ibid., 238).

² In French, “croches”. The American English terminology will be used in this article.

1.2. Burling (1966)

Our story now jumps ahead to 1966, the year that linguist Robbins Burling published a seminal study on the metrics of children's rhymes in several structurally different languages, such as English, Bengkulu, and Chinese. Whereas Brailoiu had focused on the line, Burling examined the stanza, discovering a widespread 16-beat pattern, made up of four four-beat lines. This may be illustrated by the well-known counting-out rhyme "Engine engine number nine":

- (3) Engine, engine, number nine,
 Going down Chicago line,
 If the train goes off the track,
 Do you want your money back?

(personal recollection, New Jersey, ca. 1960)

In this example the counter's gestures, used to designate each player, is synchronized with the quarter-note beat. We also note that there is a good fit between the beat and the syllables that are ordinarily stressed in the spoken language. In all the polysyllabic nouns, for example, the beat is aligned with the word stress (e.g., engine, number, Chicago, money). However, there are cases where the syllables aligned with the beat might not be stressed in spoken English: For example, "do" (in "Do you want your money back") is often reduced to "d'ya" in conversation.

Burling also notes that while beats tend to coincide with stressed syllables, this is not always the case. Many nursery rhymes have rests (designated by the letter R), as in example (4):

- (4) Hickory, dickory, dock, R
 The mouse ran up the clock, R
 The clock struck one, the mouse ran down,
 Hickory, dickory, dock. R

Furthermore, the number of syllables between successive beats may vary, with a maximum of three. In this example there are two weak syllables between beat 1, synchronized with /hi/, and beat 2, synchronized with /di/. Burling claims that the odd-numbered beats have slightly greater stress than the even-numbered beats, although the difference is subtle and may vary

with the style of recitation. He also observes that this simple English verse has “a peculiar binary character” (ibid., 1423): the 16-beat quatrains are divided into two eight-beat couplets, which are divided into four-beat lines, which are often subdivided into hemistiches marked off by internal rhymes. Like Brailoiu, Burling stresses the semi-autonomy of this model: “The pattern of beats, then, is partially independent of the rest of the language, and the trick of composing simple poetry is to fit the words to the pattern, adjusting them in such a way that their stresses will somehow fit the rhythm of beats that our ear demands.” (ibid., 1424) Burling points out that four-beat lines are extremely widespread in popular verse in English, not only in nursery rhymes, but in innumerable popular songs, advertising jingles, and light verse. Furthermore, citing the work of Lehmann (1956), he shows that the four-beat line has great historical depth and appears to be linked to the earliest poetry in the Germanic languages, in which the line is made up of four predominant syllables, “[...]two in each half-line, which are elevated by stress, quantity, and two or three of them by alliteration” (Lehmann 1956: 37).

Burling then analyzes examples of the same 16-beat pattern in two other languages, both typologically and geographically divergent from English, the Peking dialect of Chinese and Bengkulu, a Malayo-Polynesian language spoken in southwestern Sumatra. Finally, he gives some “rather random and only partially analyzed” examples from Cairo Arabic, Yoruba, and Serrano, a Southern California Indian language (ibid., 1433-1434). In his conclusion Burling states: “If these patterns should prove to be universal, I can see no explanation except that of our common humanity” (ibid., 1435). He suggests that sophisticated verse might be built in part on the foundation of simple verse, the result of modifying rules and adding restrictions. If this is the case, the “comparative study of metrics would then be the study of the diverse ways in which different poetic traditions depart from the common basis of simple verse.” (ibid., 1436).

1.3. Hayes and MacEachern 1998

Before assessing these two hypotheses, we will discuss briefly an important recent study by Bruce Hayes and Margaret MacEachern that has used Burling’s work as a starting point to build a sophisticated model of the quatrain form in English folk verse, which includes children’s verse, such as nursery rhymes, as well as traditional authentic folk verse “sung mostly without accompaniment by ordinary people and transmitted orally” (Hayes and MacEachern 1998: 474). Like Burling, Hayes and MacEachern see the folk quatrain as a

binary hierarchy, not just a sequence of four lines, but a pair of pairs, that is, the quatrain is made up of two couplets and each couplet is made up of two lines. They propose a grid representation, consisting of “a sequence of columns of x’s or other symbols, where each column may be associated with an event in time, such as the pronunciation of syllables. The height of a grid column depicts the strength of the rhythmic beat associated with the event. In sung or chanted verse it is assumed that grid rows are performed isochronously, at least in theory, abstracting away from various structural and expressive timing adjustments. This is illustrated in Figure 1 below, using the first line of example 3 (the symbol “0” represents an unfilled metrical position):

Figure 1. Grid analysis of the first line of “Engine engine number nine”

| | | | | | | | | |
|--------------------|-----|-------|-----|-------|------|-----|------|---|
| Half-note level | x | | | | x | | | |
| Quarter-note level | x | | x | | x | | | x |
| Eighth-note level: | x | x | x | x | x | x | x | x |
| | En- | gine, | En- | gine, | num- | ber | nine | 0 |

Using this framework, Hayes and MacEachern study patterns of truncation, that is, the non-filling of metrical positions at the ends of lines. They find 26 truncation patterns, each of which defines a verse type. Like Burling, they suggest that the relative simplicity of children’s verse is an advantage for studying these patterns: “Art verse and popular verse apparently also normally obey our laws, but since they are the productions of exceptional individuals, they might well be expected to involve greater complexity and idiosyncrasy[...]”. This position echoes Jakobson (1960: 369): “Folklore offers the most clear-cut and stereotyped forms of poetry particularly suitable for structural scrutiny.”

2. The Hypothesis of Metrical Symmetry

We turn now to a proposal for studying the metrics of children’s rhymes first formulated in Arleo (1997). This article points out first of all that the hypotheses put forth independently by Brailoiu and Burling are compatible, at least for the line. Although Burling also deals with the stanza, his four-beat lines are equivalent to Brailoiu’s “series worth eight”. Secondly, it is noted that in both models children’s rhymes are treated globally without looking at specific genres. However, the play function of rhymes often has a direct effect on

the metrical pattern, as in the French hand-clapping rhyme shown in example 5, which has five-beat lines:

- (5) Beats: 1 2 3 4 5
- La sa- ma-ri- tain' tain', tain',
Va à la fon- tain', tain', tain'...

Indeed, these five-beat lines are a direct reflection of the hand-clapping pattern in which players clap their hands three times on the syllable *-tain*. Finally, it is suggested that the Brailoiu and Burling models might be collapsed into a more general hypothesis, termed the Hypothesis of Metrical Symmetry (HMS). The HMS has two versions, which are formulated below:

Hypothesis of Metrical Symmetry (Arleo 1997)

Children's rhymes tend toward symmetry, defined as follows:

1. The number of beats in a given metrical unit (i.e., hemistich, line, stanza) tends to be even.
2. The number of beats in a given metrical unit tends to be a power of two.

Version 2 is a stronger and more precise than version 1: if 2 holds, then 1 will automatically apply since all powers of two are even. Furthermore, the Burling and Brailoiu models are not discarded but become special cases of version 2: Brailoiu's series worth eight and Burling's four four-beat lines are examples of metrical units containing numbers of beats that are powers of two. The fact that this is a probabilistic model reflects the expectation that "we will not find ironclad deterministic laws, but rather statistical tendencies that will undoubtedly vary from one tradition to another due to linguistic and cultural factors." (Arleo 1997: 396).

This earlier version of the HMS only concerns the number of beats in a given metrical unit, but we should also consider the number of lines in stanzas. Below is a revised version of the HMS that takes into account both the number of beats and the number of lines. A more accurate definition of "power of two" is also given.

The Hypothesis of Metrical Symmetry (revised version)

Children's rhymes tend toward symmetry, defined as follows:

1a. Beats (version a). The number of beats in a given metrical unit (i.e., hemistich, line, stanza) tends to be even.

1b. Beats (version b). The number of beats in a given metrical unit tends to be a power of two (2^n , where $n > 0$)

2a. Lines (version a). The number of lines in stanzas tends to be even.

2b. Lines (version b). The number of lines in stanzas tends to be a power of two.

Before testing the HMS, let us compare it with the work that has been summarized above. First of all, like Brailoiu and Burling, as well as Hayes and MacEachern, the beat is used as a basic unit in order to compare equivalences between metrical units. Specifically, the beat is viewed as a mental event that is shared between players or performers, which allows the synchronization of body movements, such as hand-clapping, but also phonetic gestures, such as syllable attacks. This conception of the beat is very close to that of Lerdahl and Jackendoff (1983: 18); that is, beats are idealized points in time that do not have duration. On the other hand, time spans, the intervals of time between beats, do have duration. I also assume that, as a mental event, the beat is correlated with temporal patterning in the brain, but will leave this matter to specialists.

Secondly, all these models involve some degree of idealization. In actual performance children may deviate from a regular beat by slowing down or speeding up the tempo, just as they often deviate from regular pitch patterns. Nevertheless, schoolchildren who are used to playing together often achieve a high degree of isochrony in their performances. Two crucial factors are play context and age. A regular beat is often required to synchronize movement patterns between players, as in hand-clapping games, whereas in solitary play there is usually less of a functional need to keep a steady beat. Furthermore, the acquisition of a regular beat is a gradual process that varies from child to child.

Thirdly, children's rhymes usually have several levels of beats, but generally one level is more basic. For example, in "Engine engine number nine" I can clap four beats per line (**Engine engine number nine**, or two beats per line (**Engine engine number nine**) or one beat per line, and so on. However, the four-beat per line pattern is most salient in this case, and indeed corresponds to the counter's gesture of designation. To describe this basic beat level Lerdahl and Jackendoff (1983) use the Renaissance term *tactus*. We can consider this as the foot-tapping, hand-clapping, or finger-snapping level. This is also the intermediate quarter-

note level in Figure 1 above. As can be seen, the stressed syllables tend to be aligned with beats at this level. Beat levels above and below the tactus level become progressively less salient. Hayes and MacEachern's metrical grids, which are derived from traditional musical notation, show four levels of beats, or rhythmic strength, in folk verse, but whether or not all these levels are perceived by all performers and listeners remains an open question.

Finally, as already mentioned, the previous studies have lumped together many different genres so that we might be missing some subtle distinctions. As a research strategy, it seems wise to distinguish between nursery lore, adult folklore for children, and children's folklore (or childlore). Furthermore, within children's folklore, metrical patterns should be studied genre by genre, because function often determines form, at least partially. Having outlined the theoretical framework, we will now examine two childlore genres, counting-out rhymes and jump-rope (or skipping) rhymes.

3. Testing the Hypothesis of Metrical Symmetry (revised version)

3.1 English and French counting-out rhymes

We begin by looking at the metrics of English and French counting-out rhymes. Counting-out rhymes are used by children to choose a central player in a games like tag ("le Loup") or Hide 'n seek ("cache-cache"). They are widespread in different languages and cultures. In 1888 folklorist Henry Carrington Bolton published a collection of 873 counting-out rhymes in nineteen languages or dialects, including Arabic, Basque, Marathi, Turkish, Armenian, and many Western European languages. An Italian website, created by Mauro Presini, gives examples of counting-out rhymes from about fifty countries (see address in reference list). In the counting-out ritual the players are in a circle and a counter chants or sings a rhyme to a regular beat while successively touching each player's foot, usually in a clockwise direction. The player on whom the last syllable falls is eliminated and counting-out resumes until one player is left, who is "It" (in French "le Loup" or "le Chat") (see Arleo 1997: 401). Counting-out rhymes are an ideal genre for testing cross-linguistic hypotheses because they are part of a well-documented and widespread living oral tradition passed on from child to child. Because of their status as a regulatory "meta-game", in which play organizes play, counting-out rhymes are performed both by boys and girls and tend not to go out of fashion from one generation of children to the next, as is often the case for other children's games.

Reanalyzing data in Arleo (1982), we first examine the number of lines per rhyme and then the number of beats per line. Table 1 compares the number of lines per rhyme in two samples of 40 French and 40 English counting-out rhymes. The samples were taken from two major collections, Baucomont et al. (1961) for the French rhymes, and Abrahams and Rankin (1980) for the English rhymes. These rhymes are geographically widespread, with a large number of citations, including recent versions at the time of publication.

Table 1. Distribution of 40 English and 40 French counting-out rhymes according to the number of lines

| | | | | | | | | |
|---------------------|-----|-----|----|------|------|-----------|-------|---|
| Number of lines: | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Nb. of Fr. rhymes: | 1 | 1 | 0 | 9 | 7 | 7 | 1 | 0 |
| % of total: | 2.5 | 2.5 | 0 | 22.5 | 17.5 | 17.5 | 2.5 | 0 |
| Nb of Eng. rhymes: | 0 | 6 | 2 | 19 | 2 | 6 | 0 | 2 |
| % of total: | 0 | 15 | 5 | 47.5 | 5 | 15 | 0 | 5 |
| Number of lines: | 9 | 10 | 11 | 12 | 13 | Uncertain | Total | |
| Nb. of Fr. rhymes: | 4 | 3 | 0 | 0 | 1 | 6 | 40 | |
| % of total | 10 | 7.5 | 0 | 0 | 2.5 | 15 | 100 | |
| Nb. of Eng. rhymes: | 0 | 0 | 0 | 0 | 0 | 3 | 40 | |
| % of total: | 0 | 0 | 0 | 0 | 0 | 7.5 | 100 | |

In both samples there are more rhymes with an even number of lines than rhymes with an odd number of lines. In the English sample the tendency towards an even number of lines is quite strong: 33 rhymes (82.5%) have an even number of lines against only 4 rhymes (10%) with an odd number. Furthermore, 27 (67.5%) rhymes have two, four or eight lines, and 19 out of 40 rhymes have four lines. Therefore, versions 2a and 2b of the HMS are quite strongly supported by the English data.

In the French sample, 20 rhymes (50%) have an even number of lines against 14 rhymes with an odd number of lines (35%) and 10 rhymes (25%) have two, four or eight lines. In both samples the quatrain is the most frequent pattern. The results are therefore mixed for the French sample. There is a slight tendency for the number of lines to be even; if we discount the six uncertain cases, then the percentage of even-numbered stanzas is 58.8%

against 41.2%. However, only 10 of the French rhymes are equal to a power of two, rising to 29.4% of the sample once the uncertain cases are excluded.

We turn now to the number of beats per line. According to the earlier analysis (Arleo 1982), based on the same sample of 40 English counting out rhymes, 118 out of 176 lines, (67%) had four stressed syllables. However, this underestimates the number of beats because lines with three stressed syllables often have a fourth beat that is not aligned with a syllable, as in “Hickory dickory dock” (see example 4 above). A reanalysis of the data brings the percentage of four-beat lines to 73.3%, as shown in Table 2.

Table 2. Distribution of number of beats per line in a sample of 40 English counting-out rhymes

| Number of beats: | 1 | 2 | 3 | 4 | >4 | Uncertain | Total |
|------------------|---|-----|-----|------|----|-----------|-------|
| Number of lines: | 0 | 8 | 1 | 129 | 0 | 38 | 176 |
| % of total | 0 | 4.5 | 0.6 | 73.3 | 0 | 21.6 | 100 |

The rather high number of uncertain cases is due mainly to cases where it was difficult to decide whether a line contained a rest, that is a beat not aligned with a syllable. Recordings and musical transcriptions could provide a greater degree of accuracy here, but it would be hard to obtain such a representative sample. Even allowing for a margin of error due to subjectivity in identifying rests, it is safe to conclude that the four-beat line is the predominant model for English counting-out rhymes. Since four is both even and a power of two, both versions of the HMS are therefore confirmed.

Arleo (1994) examines the number of beats per line in 27 French counting-out rhymes recorded in and around Saint-Nazaire. Nearly two-thirds (65.1%) of the lines had an even number of beats versus 34.9% with an odd number of beats. Furthermore, the four-beat line was the most common, accounting for 56.9% of the data. The evidence from French counting-out rhymes therefore supports the HMS for number of beats per line, but not as strongly as in English.

3.2. English jump-rope rhymes

We will now test the HMS for a second genre of childlore, jump-rope (or skipping) rhymes in English. The corpus for this analysis is Abrahams (1969), a large-scale compilation of jump-rope rhymes from the main English-speaking countries, including Britain, Ireland,

Australia, New Zealand, the United States and Canada, and used by children from roughly the beginning of the twentieth century until the late 1960s. According to Abrahams (1969: xv), “until relatively recently the ancient pastime of jumping rope was exclusively a boys’ activity and had no rhymed games associated with it.” The change-over seems to have occurred in the last generation of the nineteenth century, although there are reports that boys still jumped rope as a game in the 1920s in at least one region of the U.S. Furthermore, and this is particularly important for metrics, jump-rope rhymes often use verbal material from other genres, especially counting-out rhymes, but also singing games, taunts, popular songs and so on. As Abrahams (*ibid.*, xix) points out, “counting-out rhymes are the most common source, in fact, because so many jump-rope games involve counting and invoke player elimination of the ‘out-goes-she’ sort.”

Before presenting the data on the metrics of jump-rope rhymes, several methodological issues need to be addressed. The first methodological decision involved the elimination of 79 of the 619 main entries in Abraham’s dictionary because they were incomplete or, in a few rare cases, were described as improvisations that did not appear to have metrical structure. The initial corpus was therefore reduced to 540 rhymes.

The second methodological question is more complex, as it involves the theoretical status of the line in oral poetry, an issue that will be discussed below. From a practical viewpoint, in counting the number of lines per rhyme, the line division given by Abrahams was followed except in the following situations. Many rhymes are made up of a main rhyme, often a couplet or a quatrain, followed by a coda (to use the terminology proposed by Arleo 1980 for counting-out rhymes), which is often an enumeration, as shown in examples 6 and 7:

- (6) Charlie Chaplin sat on a pin.
How many inches did it go in?
One, two, three, etc.

(Abrahams 1969: 25, more than 25 sources listed)

- (7) Teacher, teacher, oh so tired,
How many times were you fired?
One, two, three, etc.

(*ibid.*, p. 186, one source from New Mexico, published in 1961)

As the metrical structure here is clearly a rhymed couplet, examples 7 and 8 were tabulated as having two lines. Furthermore, in a small number of rhymes the line division did not appear to reflect a plausible metrical structure, as in example 8a:

(8a) Bread and butter,
Sugar and spice,
How many boys think I'm nice?
One, two, three, etc.

(Abrahams 1969: 21)

This was reanalyzed as a two-line rhyme followed by a coda, as shown in 8b:

(8b) Bread and butter, sugar and spice,
How many boys think I'm nice?
+ Coda

8b is preferable because there is convergence in two key criteria for line division: the rhyme scheme and the metrical scheme, in this case the number of beats per line. Whereas 8a has an abb rhyme scheme, where line a does not rhyme with another line, 8b has a rhyming aa couplet, a basic pattern in the corpus. In 8a lines 1 and 2 each have two beats, and line 3 has four beats, giving a 2-2-4 metrical scheme, which, by analogy with rhyme scheme, we can call an aab pattern. On the other hand, 8b has two four-beat lines, a 4-4 or aa pattern. Out of the 540 rhymes in the corpus, only 11 (2% of the total) were reanalyzed, so this does not change the general conclusions that will be presented below.

The preceding discussion shows that line division is a major methodological and theoretical issue, especially when dealing with oral tradition. Oral poetry is by definition concerned with the perceptual grouping of auditory events, which is very different from reading written poetry, where the reader is guided by the conventional visual cues of layout and punctuation. Listening to and learning rhymes in an oral tradition is akin to the perception of music, where the listener usually makes unconscious grouping decisions according to preference rules based on various criteria (see Lehrdahl and Jackendoff 1983). In the case of children's rhymes the transcriber uses rhyme schemes, metrical patterns, repetition, grammatical parallelism and so on to propose a plausible line division, that is, one that brings out perceived regularities in the text. When these criteria converge, different transcribers will come up with the same line division, as in "Engine engine number nine..." (example 3), where each line has four beats and the ends of lines correspond to major syntactic boundaries. But in many cases there may be a conflict between the criteria, as in example 9a:

- (9a) I asked my mother for fifteen cents,
 To see the elephant jump the fence,
 He jumped so high,
 He reached the sky,
 And didn't come back till the Fourth of July.

(Abrahams 1969: 72)

With this line division we have five lines with an aabbb rhyme scheme, and the rhyme between *sky* and *July* is foregrounded. The metrical scheme is 4-4-2-2-4 (aabba), i.e., lines 1, 2 and 5 have four beats each and lines 3 and 4 have two beats each. The total number of beats is therefore 16, but spread over five lines. Although this rhyme was tabulated as five lines, it could very well be reanalyzed as in example 9b:

- (9b) I asked my mother for fifteen cents,
 To see the elephant jump the fence,
 He jumped so high, he reached the sky,
 And didn't come back till the Fourth of July.

This segmentation shows greater regularity: the rhyme scheme is now aabb and the third line has internal rhyme; the metrical scheme is 4-4-4-4, that is aaaa. On the other hand, the rhyme between *high* and *sky* is not highlighted or visually salient. Many of the five-line rhymes in the corpus are of this type, which is reminiscent of the metrical pattern of limericks. Had these five-line rhymes been reanalyzed as quatrains, the proportion of rhymes conforming to the HMS would have been even higher.

We return now to the data on the metrics of jump-rope rhymes. Table 3 shows the distribution of the 540 rhymes in the corpus according to the number of lines.

Table 3. Distribution of 540 jump-rope rhymes according to the number of lines

| | | | | | | | | | |
|-------------------|-----|------|-----|------|-----|-----|-----|-----|-------|
| Number of lines: | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Number of rhymes: | 25 | 108 | 33 | 232 | 36 | 33 | 6 | 47 | 5 |
| % of total: | 4.6 | 20.0 | 6.1 | 43.0 | 6.7 | 6.1 | 1.1 | 8.7 | 0.9 |
| Number of lines: | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 24 | Total |
| Number of rhymes: | 6 | 0 | 4 | 1 | 1 | 1 | 1 | 1 | 540 |
| % of total: | 1.1 | 0 | 0.7 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 100 |

Out of 540 rhymes, 433 (80.2%) have an even number of lines and 107 (19.8%) have an odd number of lines. This strongly supports version 2a of the HMS: 388 rhymes (71.9%) have a number of lines equal to a power of two, (that is, 2,4,8,or 16 lines) versus 152 (28.1%) with a number of lines not equal to a power of two. Thus, version 2b of the HMS is also confirmed. Another interesting finding is that 388 of the rhymes (73.7%) have four or fewer lines.

There are a number of other aspects of the metrics of jump-rope rhymes that cannot be investigated in detail in the present article, such as the number of beats per line or the characteristic rhyme schemes. However, it should be noted that the four-beat line is very common and that the prevailing rhyme scheme appears to be the rhymed couplet, which works like a fundamental building block. Indeed, many of the quatrains have an aabb rhyme scheme. These results confirm what I. and P. Opie (1997: 209) have written about skipping rhymes: “What are the characteristics of the successful chant (successful in the sense of being long-surviving and widespread)? It is likely to be a four-line verse with four trochaic feet in each line, the first, stressed, syllable coinciding with the slap of the rope on the ground and the jump over it.”

Another related topic that might be investigated further is the frequency of repeated lines, as in examples 10 and 11:

- (10) Ra Jelly in the dish,
 Ra Jelly in the dish,
 b Wiggle waggle, wiggle waggle,
 Ra Jelly in the dish.

(Abrahams 1969: 99)

- (11) Ra Minny and a Minny and a ha, ha, ha,
 a Kissed her fellow on a Broadway trolley car.
 a You tell Ma and I'll tell Pa.
 Ra Minny and a Minny and a ha, ha, ha.

(Abrahams 1969: 123)

A notation developed by Cornulier (1995: 266) is used here to designate repeated lines. The capital letter R means that the entire line is repeated. Thus, example 10 is a RaRabRa pattern and example 11 is a RaaaRa pattern. Repeated lines are common in oral folk traditions since

they ease the burden of memorization. Example 10 shows how minimal textual material can be expanded into a quatrain through repetition.

Conclusion

Do children's rhymes reveal universal metrical patterns? It is obviously too early to answer in terms of absolute universals, e.g. "all cultures or languages have children's rhymes with universal metrical patterns". The question might better be framed in implicational terms: if a culture or a language has children's rhymes, that is, a body of folk verse produced and transmitted primarily among children, then these are likely to have certain metrical patterns or properties. We recall that Brailoiu and Burling provided examples of children's rhymes from around the world to show that there are similar metrical patterns, but they did not deal with the frequency with these patterns compared to other patterns. Furthermore, there was little attempt to distinguish between nursery lore and childlore, to pinpoint specific genres, or to examine the influence of function on metrical form. The present approach attempts to come to terms with these issues by analyzing carefully delimited genres and by formulating a precise hypothesis, the HMS, in relative statistical terms. Although the HMS does not propose an absolute universal law, it does make specific predictions regarding the number of beats per line and the number of lines per stanza that can be tested empirically, language by language and genre by genre. This paper has strongly confirmed that the number of lines in English counting-out rhymes and jump-rope rhymes is generally even and equal to a power of two. Furthermore, English counting-out rhymes also tend to have four beats per line. Evidence from French counting-out rhymes is not as clear, although there is a slight preference for stanzas with an even number of lines and for lines with an even number of beats. Other genres of childlore that could be studied in the future include hand-clapping games and singing games, in English, French and other languages.

Although it is premature to conclude that most children's rhymes around the world are symmetrical, the accumulated evidence from Brailoiu and Burling, the present study, and other sources (Despringre 1997: 194-196) show that many children's rhymes do have elements of symmetry. We would of course like to know why such patterns are so widespread. Hayes and MacEachern (1998: 474) suggest that the striking resemblances among children's verse types from "unrelated, geographically distant languages" may be innate: "As an explanation for the resemblances Burling makes an appeal (p. 1435) to 'our common humanity', which we take to be a somewhat poetic invocation of the view that

certain aspects of cognition are genetically coded. This could occur either directly or, perhaps indirectly, at a very abstract level from which the observed systems derive.” In my own view, the relative contributions of nature and nurture to the symmetry of children’s rhymes remain an open question. It is clear that children are not born with the ability to keep a steady beat, but acquire it, although they may be aware of regular rhythms in their environment. Children’s rhymes also depend of course on the acquisition of language. They are first learned at home, in nursery school and in other play settings, and then truly blossom in the first years of elementary school, with many individual differences among children. We know very little about how the development of children’s rhymes and other items of childlore connects with innate cognitive faculties and this is certainly a subject that requires further research.

Among the many possible explanations for symmetry in children’s rhymes, I would like to briefly focus on two. The first is that symmetry has great functional value in an oral tradition because it aids memorization. This has been demonstrated at length by cognitive psychologist David Rubin (1995) in relation to epic, folk ballads and counting-out rhymes. Along with imagery and sound patterns, regular metrical schemes contribute to predictability and provide cues for the listener. Imagine, for example, a listener or a singer who doesn’t understand or has forgotten the last word of the second line in a song with four-beat lines and an aabb rhyme scheme. By combining the multiple constraints of rhyme, metrics, grammar and meaning, the search can be narrowed down and the missing word more easily retrieved. This is one of the reasons why songs and rhymes are such effective tools for learning foreign languages (Arleo 2000). Written traditions can of course break out of these somewhat stereotyped symmetrical patterns and develop irregular innovations without interrupting the chain of transmission between sender and receiver. Similar questions arise in music. Jazz, for example, which has evolved from oral tradition to become a sophisticated musical genre, continues to exploit the symmetrical 32-bar standard as a favorite form for improvisors; it is doubtful, on the other hand, that twelve-tone serial music could have evolved from a purely oral tradition and it is highly questionable whether humans could learn to improvise dodecaphonic melodies without the support of written music.

A second possible explanation for symmetry in children’s verse is related to our bodies. Although the human body is not systematically symmetrical (think of internal organs like the heart or the liver as well as front-back and top-bottom asymmetry), when we are face to face with another human being there is a general impression of left-right symmetry. More importantly, our basic activities, like walking and breathing, are based on regular binary rhythms. MacNeilage (1998: 503), in an important article on the evolution of speech, notes

that such “biphasic cycles are the main method by which the animal kingdom does work that is extended in the time domain” and provides a long list of examples, including locomotion, heartbeat, respiration, scratching, digging, copulating, vomiting, milking cows and cyclical ingestive processes.

From the viewpoint of the linguist, the study of metrical patterns in children’s rhymes is part of a broader research project that investigates isochrony in language. Arleo (1995) has suggested that there is a scale of isochrony in speech ranging from relatively “arhythmic” styles (e.g., non-fluid speech involving many hesitations) to genres that are isochronous in nature, including cheers, children’s rhymes, chants, light poetry (such as limericks) and songs. Utterances in everyday conversation, not to mention public speeches, are often synchronized with a regular beat, and this is frequently linked to pragmatic and rhetorical purposes. While the present article has focused on the metrics of specific genres of children’s folklore, and their possible universality, it also aims to contribute more generally to research on the isochronous properties of language.

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