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COMPARATIVE ANALYSIS OF MATHEMATICAL TERMS USED IN UZBEK AND ENGLISH FOLK RIDDLES

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Abstract

This article presents a comparative linguistic and cognitive analysis of mathematical terms and lexical units with mathematical semantics used in Uzbek and English folk riddles. The study examines the functions of numerals, counting forms, quantity expressions, geometric shapes, measurements, proportions, and spatial relations as clues, comparative markers, figurative devices, and didactic tools in riddle texts. The analysis identifies both similarities and differences in the use of mathematical terminology in Uzbek and English folk riddles. The findings demonstrate that mathematical units in both traditions play a significant role in describing hidden objects, stimulating logical thinking, and developing children's cognitive abilities. However, Uzbek folk riddles tend to associate numbers with folk imagery, kinship metaphors, nature, and household objects, whereas English riddles more frequently employ mathematical units through logical questions, object shapes, functions, and practical characteristics.

Keywords: folk riddles, mathematical term, numeral, counting, quantity, geometric shape, measurement, comparative analysis, cognitive analysis, Uzbek language, English language.

Introduction

Folk riddles occupy a special place in the oral traditions of different nations as concise, figurative, and intellectually stimulating genres based on logical reasoning. In riddle texts, the name of an object or phenomenon is not stated directly; instead, its characteristics, shape, quantity, movement, or function are indirectly represented through comparisons and symbolic descriptions. Consequently, solving a riddle requires observation, comparison, generalization, analysis, and inference.

In both Uzbek and English folk riddles, words and expressions with mathematical meanings—such as numerals, counting units, quantity indicators, names of geometric shapes, measurements, and proportional relations—serve as important clues. For example, Uzbek riddles frequently employ lexical units such as *bir* (one), *ikki* (two), *besh* (five), *qirq* (forty), *ming* (thousand), *dumaloq* (round), *uzun* (long), *qisqa* (short), *og'ir* (heavy), and *yengil* (light). Similarly, English folk riddles often contain words such as *one, two, three, four, five, round, long, short, heavy, light, full,* and *empty*.

The relevance of this topic lies in the fact that mathematical terminology in folk riddles reflects not only arithmetic or geometric knowledge but also the cultural worldview and cognitive patterns of a particular community. While mathematical units are closely connected with imagery and logical thinking in both languages, their usage also reveals national and cultural distinctions.

The purpose of this article is to analyze mathematical terms used in Uzbek and English folk riddles from comparative, linguistic, semantic, and cognitive perspectives.

Literature Review and Theoretical Framework

Research on Uzbek folklore has extensively examined the antiquity, figurative nature, educational significance, and poetic structure of riddles. Studies such as Z. Husainova's *Uzbek Folk*

Riddles and various collections of Uzbek oral literature describe riddles as an effective means of developing children's observation skills, intelligence, logical thinking, and speech.

In English folklore studies, riddles are also regarded as an important manifestation of folk wisdom and oral creativity. English riddles often conceal an object through references to its shape, function, movement, or quantity. For instance, the riddle *"What has four legs but cannot walk?"* uses the numeral *four* as a clue to the external structure of the object, leading to the answer *table*. In this case, the numeral functions as a logical restriction.

Research Methodology

The study employs descriptive-linguistic, comparative, lexical-semantic, contextual, and cognitive methods of analysis. The descriptive method was used to identify mathematical units occurring in Uzbek and English folk riddles. The comparative method enabled the identification of similarities and differences between the two traditions. Lexical-semantic analysis was applied to interpret the meanings of units expressing number, quantity, shape, measurement, and spatial relations. The cognitive approach was used to demonstrate how mathematical units contribute to the formation of mental models that facilitate the interpretation of riddles.

Use of Numerical Terms in Uzbek and English Folk Riddles

Numerals and counting expressions represent the most active mathematical units in folk riddles. They indicate the number of parts constituting an object, their arrangement, and their relationships.

In Uzbek riddles, the numeral *bir* (one) often symbolizes uniqueness, centrality, or a starting point. For example, in the riddle meaning *"One mother, a thousand children,"* the word *one* denotes singularity, while *thousand* indicates multiplicity, metaphorically referring to the moon and stars.

Similarly, in English riddles, the numeral *one* often denotes uniqueness. In the riddle *"What has one eye but cannot see?"* the phrase *one eye* refers to the eye of a needle. Here, the numeral highlights the object's most distinctive feature.

The numerals *ikki/two* symbolize duality, symmetry, and paired structures. In Uzbek riddles, the expression *"Two brothers who never see each other"* refers to the eyes. In English, the riddle *"What has two hands but cannot clap?"* refers to a clock. In both cases, the numeral indicates paired components of an object.

The numeral *to'rt/four* is associated with stability, legs, corners, and support structures. Uzbek riddles often describe animals or objects through references to four legs, while the English riddle *"What has four legs but cannot walk?"* points to a table.

The numeral *besh/five* is frequently associated with fingers in both traditions. Uzbek expressions such as *"five brothers"* metaphorically describe fingers. Likewise, the English riddle *"What has five fingers but is not alive?"* refers to a glove.

Comparative Analysis of Geometric Shape Terms

Geometric terms occupy an important position in both Uzbek and English folk riddles. Uzbek riddles employ words such as *dumaloq* (round), *doira* (circle), *burchak* (corner), *uzun* (long), *qisqa* (short), and *halqa* (ring), while English riddles use *round, square, circle, long, short, straight,* and *curved*.

The Uzbek adjective *dumaloq* often refers to the moon, coins, bowls, apples, and other round objects. Similarly, English riddles use *round* to indicate geometric characteristics. For example, the riddle *"I am round and bright, I shine at night"* refers to the moon.

Measurement, Quantity, and Proportional Relations

Uzbek riddles commonly use oppositional pairs such as *katta-kichik* (big-small), *uzun-qisqa* (long-short), *og'ir-yengil* (heavy-light), *yaqin-uzoq* (near-far), and *to'la-bo'sh* (full-empty) to compare objects. English riddles employ equivalent lexical pairs with similar functions.

For example, in Uzbek riddles about fingers, the expression *"five friends, big and small"* highlights differences in size and length. In English, the riddle *"What is full of holes but still holds water?"* uses the adjective *full* to indicate the object's capacity and structure. The answer is *a sponge*.

Semantic and Cognitive Functions of Mathematical Terms

Mathematical terminology in Uzbek and English folk riddles performs several important functions:

1. **Indicative Function** – Numerals, shapes, and measurements point to the most significant features of an object.
2. **Restrictive Function** – Mathematical clues narrow the range of possible answers.
3. **Figurative Function** – Mathematical elements contribute to metaphorical and symbolic imagery.
4. **Didactic Function** – They teach children counting, comparison, shape recognition, logical reasoning, and inference.

Discussion

The comparative analysis reveals that mathematical terminology serves similar cognitive functions in Uzbek and English folk riddles. In both traditions, numerals, geometric forms, and measurement units guide listeners toward identifying hidden objects and stimulate logical reasoning.

Nevertheless, important cultural differences can be observed. Uzbek riddles frequently combine mathematical terms with metaphors, folk symbolism, and kinship imagery. Fingers may be represented as *brothers*, eyelashes as *girls*, and onion layers as *shirts*. English riddles, in contrast, tend to emphasize logical paradoxes and functional characteristics, as illustrated by examples such as *"four legs but cannot walk," "two hands but cannot clap,"* and *"five fingers but is not alive."*

Thus, mathematical terminology in Uzbek riddles primarily contributes to poetic imagery and cultural symbolism, whereas in English riddles it more often functions as a logical and descriptive device.

Conclusion

The comparative analysis demonstrates that numerals, counting forms, geometric shapes, measurements, quantities, and spatial relations constitute essential components of both Uzbek and English folk riddles. These units help conceal and reveal objects, provide clues, create logical restrictions, enhance imagery, and contribute to children's cognitive development.

Uzbek folk riddles tend to connect mathematical terminology with folk imagery, kinship metaphors, nature, and household objects. English riddles, by contrast, frequently employ mathematical concepts through logical questioning, object functions, and physical characteristics.

Overall, mathematical terminology in Uzbek and English folk riddles illustrates the close relationship between language, cognition, and culture. These units reflect how different communities perceive, classify, compare, and interpret the world around them, making the topic significant for comparative linguistics, folklore studies, cognitive linguistics, and ethnomathematics.

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