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A contrastive study of pragmatic and semantic features in typical and atypical comparative constructions across English, Chinese, Russian, and Turkmen: cognitive interpretations explored

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This article presents a contrastive analysis that sheds light on the similarities and differences of comparative constructions in English, Chinese, Russian, and Turkmen, and the reasons behind them from a cognitive perspective. Specifically, based on the analysis of the massive online English, Chinese, and Russian corpora, namely the Corpus of Contemporary American English, the Russian National Corpus, the Center for Chinese Linguistics Corpus, and the self-built Turkmen corpus data, this study focuses on pragmatic and semantic features of typical and atypical comparatives, providing a comprehensive analysis of their resemblances and distinctions. The similarities are chiefly exhibited in the prominent usage of typical comparative constructions, the occurrence of comparative deletion, and atypical semantic features based on the typical ones. The differences mainly lie in the preference for typical synthetic or analytic forms and the distribution between concrete and abstract atypical forms, expression forms of degree semantics in typical comparatives, and semantic types of atypical comparatives. The cognitive interpretations for the similarities of the typical and atypical comparative constructions in the mentioned languages are mainly reflected in human cognition toward the comparatives. The cognitive interpretations for the differences are mainly manifested in the diverse levels of salience and specificity of construal modes in the context of comparison.

KEYWORDS

comparative constructions, contrastive analysis, pragmatics, semantics, cognitive interpretation

1 Introduction

Drawing upon the existing literature on comparatives (e.g., Kennedy, 2002; Heim, 2000; Schwarzschild, 2008; Bhatt and Takahashi, 2011), in this article, the term "typical comparative constructions" is restricted to comparatives of inequality in which at least two participants are compared with regard to a specific property. For instance, in (1), a comparison is made between the height of *Anna* and *Mary:*

1. Anna is taller than Mary.

Cross-linguistically, comparative constructions typically encompass four elements: the comparative target (CT), the comparative standard (CS), the standard marker (SM), and the

gradable predicate (GP) that encodes the property being compared (Zhou, 2024; Dixon, 2005; Stassen, 1985). In (1), CT-*John*, CS-*Tom*, SM-*than*, and GP-*tall*. Certain comparative constructions within languages encompass the "degree marker" (DM) that is analogous to the *-er* found in *taller*, as well as *more* as seen in *more intelligent* (Alrenga et al., 2012).

However, comparative constructions exist in languages where the comparison exceeds the typical framework (Dixon, 2005). See (2) in English:

2. Mary is more kind than intelligent. (Dixon, 2005, p. 8)

In (2), two properties, "short" and "fat" are compared in association with a single participant "Mary" in terms of degree (Dixon, 2005). The comparatives like (2) are termed as "atypical comparatives" in this article.

In the field of linguistics, numerous studies by prominent linguists have been mostly centered around typical comparative constructions. Scholars (Greenberg, 1963; Ultan, 1972; Stassen, 1985; Haspelmath, 1998, 2017; Kennedy, 2002; Heim, 2000; Schwarzschild, 2010; Bhatt and Takahashi, 2011; Luo, 2017a,b, 2021) have delved deeply into aspects of these typical structures, yet very few have turned their attention to atypical comparative constructions (Dixon, 2005). This imbalance in research focus becomes more glaring when considering a cross-linguistic perspective. Specifically, the semantic and pragmatic features of both typical and atypical comparative constructions in English, Chinese, Russian, and Turkmen remain largely unexplored.

In this research, we systematically explored the semantic and pragmatic features of typical and atypical comparative constructions across English, Chinese, Russian, and Turkmen.

Our study enriches cross-linguistic research by shedding light on the cognitive strategies for expressing inequality comparatives across languages, and it fills the gap in the understanding of the semantic and pragmatic aspects of comparative constructions in these languages, which has been largely overlooked in previous studies.

2 Literature review

2.1 Typological perspectives: charting cross-linguistic variations

The typological study of comparative constructions has been a cornerstone in understanding the diversity of language forms across the globe. Greenberg's (1963) early work was revolutionary as it identified basic typological characteristics of comparative structures. His research was foundational, providing a starting point for subsequent scholars to build upon. Ultan (1972) expanded this framework, offering a more comprehensive typology that classified comparative constructions based on universal language parameters. By analyzing a wide range of languages, Ultan's work allowed for a more nuanced understanding of the different types of comparative forms that exist.

Stassen (1985) further deepened this area of study. His extensive analysis of numerous languages refined the understanding of comparative construction typology. Stassen's research not only described the various types but also explored the factors that might influence the emergence and prevalence of different comparative structures in different languages. Haspelmath's (1998, 2017) contributions were equally significant. He introduced new data and theoretical frameworks, challenging some of the long-standing assumptions in the field. For example, his work questioned certain traditional categorizations and proposed alternative ways of classifying comparative constructions, which spurred further research and debate.

In the context of Chinese linguistics, Danqing (2003) applied typological methods to Chinese comparative constructions. Their studies were crucial in highlighting the unique features of Chinese comparatives within the broader typological landscape. By comparing Chinese with other languages, they were able to identify characteristics that are specific to the Chinese language, such as the use of particular particles in comparative expressions, and how these features relate to the overall typology of comparative constructions.

2.2 Degree semantics: unraveling the meanings of degrees in comparison

The exploration of degree semantics in relation to comparative constructions has been a rich area of research. Von Stechow (1984) was among the first to introduce key semantic concepts related to degrees in comparison. His work provided the basic semantic building blocks for understanding how degrees are encoded in comparative statements. Kennedy (1999, 2002, 2007b) made substantial contributions by developing formal semantic models. These models precisely captured the meaning of degree-based comparative expressions, taking into account factors such as the scalar nature of adjectives and the role of context in determining the degree of comparison.

Heim (2000) offered alternative semantic analyses, often engaging in productive debates with existing models. Her work challenged some of the assumptions made by previous scholars, such as the way degrees are quantified in comparative statements. Schwarzschild (2008) focused on the interaction between degrees and other semantic elements in comparative structures. He explored how the presence of certain semantic features in the compared entities can affect the interpretation of the degree of comparison. Bhatt and Takahashi (2011) brought on cross-linguistic evidence to enrich the study of degree semantics. Their research showed that while there are universal aspects to the semantics of degrees in comparative constructions, there are also language-specific variations that need to be considered. Luo (2017a,b) applied these international theories to the study of Chinese, exploring how the concept of "degree" operates within the Chinese comparative system.

2.3 English-specific and component-structure analyses: decoding the inner workings of English comparatives

Bresnan's (1973, 1975) works were fundamental in analyzing the syntactic structure of English comparative constructions. She provided a detailed account of how different components of the comparative construction interact, such as the role of the comparative marker "than" and the syntactic position of the compared elements. Dixon (2005) took a different approach, offering a more

functional-typological analysis of English comparatives. He considered the usage of English comparative constructions in different discourse contexts, showing how the form of the comparative can vary depending on the communicative purpose. Guo (2015) continued this line of research, bringing in new insights from contemporary linguistic theories. He explored how recent theoretical developments, such as construction grammar, can be applied to better understand the structure and meaning of English comparative constructions.

2.4 Syntactic and semantic features: uncovering the interplay

Bacskai-Atkari (2014, 2018) conducted in-depth studies on the syntactic features of comparative constructions. Bacskai-Atkari (2018) provided a new analysis for the syntax of comparatives, focusing on various deletion phenomena affecting the subclause. Schwarzschild (2008) explained the semantics of comparatives based on the concept of a threshold. Schwarzschild (2008) also explored how to interpret comparative clauses that contain quantifiers, such as "brighter than on many other days." He analyzed the interaction between quantifiers and comparatives to clarify the semantic relationship in such structures. Alrenga et al. (2012) hypothesized that both the comparative morpheme "more/−er" and the standard morpheme "than" contribute to the semantics of comparison. The surface position of the "than-phrase" marks the scope of comparison, establishing a direct mapping between surface syntax and semantic interpretation. The hypothesis might offer insights into certain cross-linguistic generalizations concerning the expression of comparison. For example, it could help explain why some languages (Chinese, Turkish, Turkmen) have similar syntactic structures for comparatives without degree markers, or how the semantics of comparison is expressed differently in various languages.

2.5 The present study

The present study endeavors to comprehensively explore both typical and atypical comparative constructions in English, Chinese, Russian, and Turkmen. It specifically delves into the similarities and differences in the pragmatic and semantic features of these constructions. Furthermore, the study aims to offer in-depth cognitive interpretations underlying these similarities and differences, thereby contributing to a more profound understanding of comparative constructions across these diverse languages.

Guided by the aforementioned research objectives, the following research questions are formulated:

1. What are the similarities and differences in pragmatic and semantic features in typical comparative constructions across English, Chinese, Russian, and Turkmen?
2. What are the similarities and differences in pragmatic and semantic features in atypical comparative constructions across English, Chinese, Russian, and Turkmen?
3. What are the cognitive interpretations of the similarities and differences in typical and atypical comparative constructions across English, Chinese, Russian, and Turkmen?

Prototype theory (Rosch, 1973) will be employed to explore the cognitive interpretations for the similarities and Construal theory (Langacker, 2008), on the other hand, will be applied to investigate the cognitive interpretations of the differences in typical and atypical comparative constructions across target languages.

Due to the confined scope within this article, we will merely explore the typical and atypical comparative constructions that incorporate the standard markers "than," "比" (than), "чем" (than), and "-dAn[1]" (ablative case marker) in English, Chinese, Russian, and Turkmen, respectively.

3 Methods

3.1 Corpus selection and processing

In the study of comparative constructions across languages, corpus selection is crucial for obtaining reliable and representative data. This section details the four corpora employed in this research, namely the Corpus of Contemporary American English (COCA), the Russian National Corpus (RNC), the Center for Chinese Linguistics Corpus (CCL), and a self-built Turkmen corpus. Each corpus was selected based on its unique characteristics and its ability to contribute to a comprehensive understanding of comparative constructions in its respective language.

3.1.1 Corpus of contemporary American English

The Corpus of Contemporary American English is a valuable resource for analyzing English comparative constructions due to its extensive size and diverse range of registers. With 560 million words of text, COCA encompasses various language use scenarios, from spoken language in conversations and interviews to formal academic writing (O'Keeffe and McCarthy, 2022). This diversity is essential as comparative forms can vary significantly depending on the register. For example, in spoken English, comparative constructions may be more informal and abbreviated, while in academic writing, they tend to be more precise and follow strict grammatical rules.

To study English comparative constructions, we focused on two main types: typical and atypical. For typical comparatives, we searched for constructions with degree markers "-er" (e.g., "taller") and "more" (e.g., "more beautiful"), along with the standard marker "than." For atypical constructions, we targeted those with the degree marker "more" and the standard marker "than," such as "more a friend than a teacher." Given that written academic texts are overrepresented in COCA, we strategically decided to extract a larger proportion of data from the spoken sub-corpora when investigating colloquial and less-studied atypical comparative cases. This approach was informed by the need to capture the full range of English comparative usage in natural language settings, as proposed by Biber et al. (1999), who emphasized the importance of analyzing language in context.

1 -dAn in Turkmen corresponds to English "than, from, of," and we capitalize underspecified segments that adapt to vowel harmony; A stands for {a,e}in Turkmen.

3.1.2 Russian National Corpus

The Russian National Corpus is an indispensable tool for researching Russian comparative constructions. Spanning from the 18th century to the present, the RNC contains over 2 billion tokens, including newspapers, sport articles, and literary style books (Lagutina et al., 2019). This vast collection allows for a comprehensive analysis of the development and usage of comparative forms in Russian.

In our study, we first searched for typical comparative constructions in Russian, which feature degree markers "-ее/—е" and "более" and the standard marker "чем." Additionally, we explored genitive-marked comparatives, such as "Моя книга интереснее твоей" (My book is more interesting than yours). For atypical comparative constructions, we focused on those with the degree marker "скорее" (rather) and the standard marker "чем," like "Бумага скорее кремовая, чем белая" (The paper is rather cream-colored than white).

Since Russian and English belong to the Indo-European language family, we hypothesized that there might be some syntactic and semantic similarities in their atypical comparative constructions, as suggested by Chomsky's (2014) universal grammar theory. To test this hypothesis, when exploring atypical comparative constructions in the RNC, we focused on exact matches with English atypical comparative constructions. By doing so, we aimed to identify potential cross-linguistic patterns and gain insights into the universality of comparative construction features within the Indo-European language family.

3.1.3 Center for Chinese Linguistics Corpus

The Center for Chinese Linguistics Corpus, developed by Peking University, holds significant academic value for the study of Chinese comparative constructions. The corpus consists of two types of monolingual corpora: modern Chinese and ancient Chinese, with a time span ranging from the 11th century BC to the present. For our research, we concentrated on the modern Chinese corpus, which contains approximately 600 million characters and covers a wide variety of genres, including literature, drama, newspapers, translated works, online materials, practical writings, TV and movies, academic documents, historical biographies, cross-talks, and spoken language.

In Chinese, the most common typical comparative construction is the "A 比 B + Adj" structure, such as "他比我高" (He is taller than me). To retrieve relevant data from the CCL, we input the query "?比? + [Adjective]" into the corpus search interface, where "?" represents any Chinese character or a group of characters. This query effectively captures sentences following the typical comparative construction pattern.

For atypical comparative constructions, which often have unique patterns in Chinese, we designed specific search strategies. For example, in the construction "一天比一天好" (getting better day by day), we used the query "?比? + [Adjective/Verb]" with the additional condition that the two "?" represent time-related expressions. For more complex atypical constructions, like "他比老外还要老外" (He is even more foreigner-like than a foreigner), which rely on semantic-pragmatic understanding, we utilized the corpus's context-viewing function. By analyzing the sentences before and after the target sentence, we were able to better understand the pragmatic meaning and usage environment of these constructions. To ensure the representativeness of the data, we employed a stratified sampling method, selecting data from different genres proportionally, as recommended by corpus linguistics best practices (McEnery and Wilson, 2001).

3.1.4 Self-built Turkmen corpus

To supplement the analysis with data from a language outside the major language families represented by the other corpora, we constructed a self-built Turkmen corpus. Our Turkmen corpus comprises over 150 million tokens, carefully curated to ensure linguistic diversity and representativeness. We prioritized materials from post-1970 publications to capture the contemporary usage of the Turkmen language. Sampling adhered to the following criteria:

Temporal Distribution: The corpus sampling follows a deliberate temporal allocation. Note that 70% of the tokens are sourced from post-1991 texts, reflecting the modern, standardized form of Turkmen. The remaining 30% comes from 1970 to 1990 publications, which has been carefully processed to remove non-Turkmen linguistic influences.

Genre-based stratification was employed to cover diverse communicative contexts:

Fiction (60%): This category includes novels, poetry, and folklore. Priority was given to works by authors associated with the Magtymguly National Institute of Manuscripts, ensuring the inclusion of culturally significant and high-quality literary materials.

Non-fiction (40%): It encompasses online newspapers, academic articles, and government publications, capturing formal and informative language use.

Data collection involved a combination of automated web scraping tools and manual curation. We used specialized web scraping software to retrieve materials from 12 Turkmen-language websites. To overcome restrictions on paywalled or dynamically generated content, we manually curated the data, ensuring compliance with ethical data usage guidelines. All downloaded materials were stored locally for long-term accessibility.

The downloaded PDF files were converted to TXT files using AntFileConverter (Version 2.1.0), a software tool designed for batch conversion. For scanned documents, optical character recognition (OCR) was applied to accurately extract text while preserving diacritics and Turkmen-specific characters (e.g., ä, ň, ž). Subsequently, we removed headers, footers, page numbers, and extraneous symbols to clean the raw text.

The converted texts were then imported into AntConc (Version 4.2.4) for systematic annotation. We adopted a hybrid approach, combining automated scripts and manual validation to tag key linguistic features. One of the main features was the degree marker "-rAk" in Turkmen, which is a comparative suffix (e.g., ulyrak [larger], owadanrak [more beautiful]). Due to Turkmen's vowel harmony rules, we developed a rule-based system to handle underspecified vowels (represented as A in -rAk), dynamically assigning {a, ä} based on the preceding vowel (e.g., ejizräk [weaker] vs. çaltrak [faster]).

We also systematically annotated the case marking, particularly the ablative case marker "-dan" in Turkmen. In comparative contexts, "-dan" functions similarly to the English "than," marking the standard of comparison (e.g., "Sen men - den uzyn." [You are taller than me.]). To ensure the accuracy of the annotation, a team of three native Turkmen linguists reviewed a 10% random sample of the corpus. The inter-annotator agreement was measured using Cohen's kappa coefficient, which reached a value of 0.89, indicating a high level of consistency among the annotators (Landis and Koch, 1977). This high level of agreement validates the reliability of our annotation process and, consequently, the data used in our analysis of Turkmen comparative constructions.

3.2 Theoretical framework

3.2.1 Rosch's prototype theory (1973)

Prototype theory (Rosch, 1973) serves as a fundamental framework for the analysis of the similar features of comparative constructions within the purview of this study. This theory posits that categories are not delineated by a set of necessary and sufficient features; rather, they are organized around prototypes, which are the most exemplary and representative members of a given category. In the context of comparative constructions, typical or prototypical modes of making comparisons exist that are more central and core to the category of "comparative" within a specific language.

Typical comparatives characteristically exhibit distinct and consistent formal and semantic attributes. For instance, in English, the construction "X -er/more Y than Z," in Russian "X -е/—ее/более Y чем Z," in Chinese "X 比 Y Z," and in Turkmen "X Y-dan Z" exemplify prototypical ways of expressing comparison. These forms are highly regular, recurrently employed, and possess uncomplicated semantic interpretations associated with quantitative or qualitative disparities.

Conversely, atypical comparatives deviate from these prototypical forms. They may incorporate metaphorical comparisons, such as "Her eyes are brighter than the stars," idiomatic expressions, for example, "Bala baldan süýji" [The baby is sweeter than honey.] in Turkmen, or less conventional syntactic structures, like the Chinese expression "老师比家长还家长 lǎo shī bǐ jiā zhǎng hái jiā zhǎng" (The teacher is more like a parent than the parent). By applying Prototype theory (Rosch, 1973), it becomes feasible to categorize comparative constructions in each language as either typical or atypical, assess the degree of typicality, and comprehend how these constructions expand upon the prototypical concept of comparison. As noted by Taylor (2003), prototype theory has been widely applied in linguistic categorization studies, providing a solid basis for understanding the variability within language categories.

3.2.2 Langacker's construal theory (2008)

In the context of comparative constructions, Construal theory (Langacker, 2008) offers a powerful framework for understanding how speakers of target languages perceive, conceptualize, and express comparative relationships differently. Langacker (2008) asserted that the content is akin to a scene, and construal is a particular means of observing this scene, namely, the subjective selection of the conceptual content by the conceptualizing subject throughout the process of language expression (Langacker, 2008, p. 96). Construal theory (Langacker, 2008) encompasses four dimensions: salience, focusing, specificity, and perspective. Our study primarily elaborates on the differences between the dimensions of salience and specificity. As argued by Evans and Green (2006), construal theory provides valuable insights into the cognitive mechanisms underlying language use, which is highly relevant to the analysis of comparative constructions.

3.3 Analysis

The data on the frequencies of these comparative constructions in target languages were collected and analyzed quantitatively and qualitatively.

3.3.1 Overall chi-square test

A chi-square test was conducted on the data representing the frequencies of typical and atypical comparative constructions across English, Chinese, Russian, and Turkmen.

The calculated Chi-square statistic was approximately 381.86, with degrees of freedom determined by $(r - 1)\times (c - 1)$, where $r = 4$ (number of languages) and c = 2 (types of comparative constructions), resulting in 3 degrees of freedom.

Comparing this value to the critical value from the Chi-square distribution table, at a significance level of alpha = 0.05, the critical value is 7.815. Given that 381.86 > > 7.815, and with an associated *p*-value that is extremely small (much less than 0.05), we reject the null hypothesis. The null hypothesis assumed that there is no relationship between language and the type of comparative construction. This result strongly indicates that there is a significant association between the language and the use of typical or atypical comparative constructions.

3.3.2 Quantitative analysis of individual comparative constructions

3.3.2.1 Frequency distribution of typical comparative constructions

In English, the observed frequency of typical comparative constructions was 225,208. This high count is a reflection of the well established and frequently employed "X – er/more Y than Z" construction in English. English, being a global language with extensive written and spoken usage, has a dominant preference for this prototypical form, which accounted for approximately [225,208/(225,208 + 177,401 + 162,604 + 18,513)] * 100% ≈ 38.8% of the total typical comparative construction occurrences across the four languages.

The Chinese presented 177,401 instances of typical comparative constructions. The "X 比 Y Z" structure is the cornerstone for expressing comparisons in Chinese. Its relatively high frequency can be attributed to the language's wide application in various communication scenarios. Chinese typical comparative constructions made up around [177,401/(225,208 + 177,401 + 162,604 + 18,513)] * 100% ≈ 30.6% of the total typical cases.

The Russian language had 162,604 typical comparative constructions. The language's morphological and syntactic rules, as manifested in constructions like "X – е/—ее/более Y чем Z" and genitive case-marked comparatives, contribute to this substantial number. This frequency constitutes approximately [162,604/(225,208 + 177,401 + 162,604 + 18,513)] * 100% ≈ 28.1% of the overall typical comparative construction frequencies.

Turkmen, with 18,513 typical comparative constructions, shows a lower frequency than the other three languages. The "X Y – dan Z" construction, while regular in use, is meanwhile less prevalent due to the language's more limited geographical spread and speaker population. Typical comparative constructions in Turkmen contribute about [18,513/(225,208 + 177,401 + 162,604 + 18,513)] * 100% ≈ 3.2% to the total typical comparative construction frequencies.

3.3.2.2 Frequency distribution of atypical comparative constructions

English recorded 700 atypical comparative constructions. These forms, including metaphorical and idiomatic expressions, add

rhetorical and expressive value to the language. They accounted for approximately [700/(700 + 86 + 521 + 69)] * 100% ≈ 53.8% of the total atypical comparative construction occurrences across the four languages.

The Chinese language had only 86 atypical comparative constructions. Atypical Chinese comparative expressions, such as "老师比家长还家长 lǎo shī bǐ jiā zhǎng hái jiā zhǎng," are less commonly used. In our data, Chinese atypical comparative constructions made up approximately [86/(700 + 86 + 521 + 69)] * 100% ≈ 6.6% of the total atypical cases.

Russian exhibited 521 atypical comparative constructions. Their frequency constitutes approximately [521/(700 + 86 + 521 + 69)] * 100% ≈ 40.1% of the overall atypical comparative construction frequencies.

Turkmen had 69 atypical comparative constructions. Atypical comparative constructions contribute in Turkmen [69/(700 + 86 + 521 + 69)] * 100% ≈ 5.3% to the total atypical comparative construction frequencies.

3.3.3 Qualitative analysis

The qualitative differences in the frequencies of typical and atypical comparative constructions (as identified *via* chi-square tests) are interpreted through the interplay of linguistic structure, semantic feature, and cognitive principles.

The first step involves identifying the typical and atypical forms in each language according to their linguistic structure. For example, in English, the construction "X -er/more Y than Z," in Russian "X -e/—ee/более Y чем Z," in Chinese "X 比 Y Z," and in Turkmen "X Y-dan Z" are identified as typical comparatives. After that, we identified atypical comparatives in each language. Each language has its own structural rules for expressing atypical comparisons. Then, we clarified the semantic nature of the comparison in each language, whether it was about physical attributes, abstract qualities, or other aspects. For instance, the metaphorical expression "your eyes are brighter than the stars" has a specific semantic meaning that goes beyond the literal comparison of brightness.

Then we cognitively analyzed how speakers of target languages conceptualize and express comparisons. Cognitive processes, such as categorization and metaphorical thinking, play a role in choosing and understanding comparative constructions. For example, the metaphorical comparison in Chinese "假的结婚证比真的结婚证还要真 jiǎ de hūn zhèng zhèng bǐ zhēn de hūn zhèng zhèng hái yào zhēn [The fake marriage certificate seems more genuine than the real one.]" shows how cognitive principles allow for the transfer and emphasis of the concept of genuineness in a non-literal way.

The interaction of these three elements—linguistic structure, semantics, and cognitive principles—provides a comprehensive framework for analyzing and understanding the qualitative differences in typical and atypical comparative constructions across the target languages.

4 Results

4.1 Pragmatic features in typical and atypical comparative constructions: cross-linguistic similarities and differences

Comparative constructions, whether typical or atypical, serve as critical tools for encoding scalar relationships and evaluative judgments (Dixon, 2005). This section synthesizes the similarities and differences in the pragmatic functions of these constructions across English, Chinese, Russian, and Turkmen.

4.1.1 Similarities in pragmatic functions

With respect to the fundamental functionality, all four languages employ typical comparatives as default mechanisms for explicit, scalar comparisons [e.g., English "X - er/more Y than Z," Chinese "X 比 Y Z," Russian "X -e/—ee/более Y чем Z," Turkmen "X Y-dAn Z (—rAk)]." These forms prioritize clarity and efficiency, enabling speakers to unambiguously rank entities along a measurable axis (e.g., size, speed, quality). Similarly, atypical comparatives in target languages extend beyond literal comparisons, serving metaphorical or evaluative purposes (e.g., English "John is more rude than insensitive," Chinese "他们比道家还要道家, 比佛家还要佛家。Tāmen bǐ dàojiā hái yào dàojiā, bǐ fó jiā hái yào fó jiā.," Russian "Знание охотника скорее терпение чем знание. [The hunter's knowledge is more patience than knowledge.]," Turkmen "Şahyrymyz Magtymgulynyň galamy gylyçdan ýiti. [Our Poet Magtymkuly's poems are sharper than a sword.]). Such constructions rely on conceptual blending (Fauconnier and Turner, 2002) to map abstract domains (e.g., authenticity, emotion) onto concrete comparisons or the degree of abstraction. Above, we demonstrate the overall frequency of typical and atypical comparatives across the target languages, as presented in Table 1.

According to Table 1, in the COCA, the total frequencies of typical and atypical comparative constructions in English are 225,208 and 700, respectively. In the CCL, for Chinese, they are 177,401 and 86, respectively. In the RNC, for Russian, they are 162,607 and 521, respectively. In the self-built Turkmen corpus, they are 18,513 and 69, respectively. The ratios of the atypical comparative constructions to the typical ones in English, Chinese, Russian, and Turkmen are 1:322, 1:2063, 1:312, and 1:268, respectively. The cumulative frequency hierarchy of the typical and atypical comparative constructions in the mentioned languages is as follows: Typical > Atypical. Evidently, this consistent pattern across target languages suggests a universal tendency in language usage to rely more heavily on typical comparative

TABLE 1 The frequency of typical and atypical comparative constructions in English, Chinese, Russian, and Turkmen.

Languages	Typical comparative constructions	Atypical comparative constructions	Total frequency	Ratio of atypical to typical comparatives
English	225,208 (99.7%)	700 (0.3%)	225,908 (100%)	1:322
Chinese	177,401 (99.95%)	86 (0.05%)	177,487 (100%)	1:2063
Russian	162,607 (99.7%)	521 (0.3%)	163,128 (100%)	1:312
Turkmen	18,513 (99.63%)	69 (0.37%)	18,582 (100%)	1:268

constructions. It may indicate that typical forms are more cognitively accessible, easier to process, and more in line with the standard communicative norms in these languages when expressing comparative relationships.

4.1.2 Differences in pragmatic features

This section delves into the disparities in the pragmatic features of typical and atypical comparative constructions in English, Chinese, Russian, and Turkmen, as illuminated by the data in Table 2.

These differences not only reflect the unique syntactic and semantic characteristics of each language but also have profound implications for how speakers convey meaning, attitude, and social relationships.

4.1.2.1 Differences in typical comparative constructions

English showcases a relatively balanced distribution between synthetic (75.3%) and analytic (24.7%) typical comparative constructions. Chinese has a significant proportion of typical comparative constructions at 67.4%, with analytic forms accounting for 32.6%. The use of synthetic-type comparatives in Chinese is closely tied to the language's tendency for parsimonious expression in many daily-life scenarios (他比我高。tā bǐ wǒ gāo). [He is taller than me.]. The analytic forms (e.g., 学习比工作更难。xué xí bǐ gōng zuò gèng nán) [Studying is more difficult than working.] can serve to introduce more complex or nuanced comparisons. Russian demonstrates a stark contrast, with synthetic typical comparative constructions constituting a whopping 98.55% and analytic forms a mere 1.45%. This heavy reliance on synthetic forms (выше [taller]) is rooted in the language's morphological richness and traditional usage patterns (Grashchenkov and Lyutikova, 2017). The rare use of analytic forms (более высокий) could be reserved for special rhetorical or literary effects. Turkmen has a distribution of 70.72% for synthetic and 29.3% for analytic typical comparative constructions. Similar to other languages, the synthetic forms are more common in ordinary communication. The analytic forms, though less frequent, can be used to exaggerate or to emphasize the comparison in specific contexts, such as in literary works.

4.1.2.2 Differences in atypical comparative constructions

English shows that 88% of atypical comparative constructions are concrete (objective-based), while 12% are abstract (subjective-based). Concrete comparisons in English, such as "This box is heavier than that one," are straightforward and commonly used in practical communication. They serve the pragmatic function of providing clear-cut information about the physical or measurable properties of objects. In contrast, abstract atypical comparatives like "Hope is brighter than sunshine" are less frequent but carry rich symbolic and emotional meanings. They are often found in literary or creative contexts in the written corpus.

Chinese has 91% of atypical comparative constructions being concrete and 9% being abstract. Concrete comparisons are mostly found in spoken and literary corpus. For example, "他的汉语水平一天比一天好" (Tā de Hànyǔ shuǐpíng yītiān bǐ yītiān hǎo) shows the progressive improvement of someone's Chinese skills over time. The abstract atypical comparatives are used to express profound or intangible concepts, often drawing on cultural and literal connotations. For example, "这假的结婚证比真的结婚证还要真" (Zhè jiǎ de hūnzhèngzhèng bǐ zhēn de hūnzhèngzhèng hái yào zhēn) is a metaphorical and abstractive-based comparative construction.

Russian has 95% of atypical comparatives being concrete ("Бумага скорее кремовая, чем белая"). [The paper is cream rather than white.] and only 5% ("Знание охотника скорее терпение чем знание"). [The hunter's knowledge is more patience than knowledge.] being abstract. The dominance of concrete atypical comparisons in Russian reflects the language's practical-oriented communication style in most situations. When abstract comparisons are made, they can have a powerful impact, often reserved for poetic or philosophical discourses.

Turkmen has 81% of atypical comparatives being concrete and 19% being abstract. Concrete atypical comparisons are the norm in Turkmen for routine communication, facilitating the exchange of information about tangible things. For example, "Ýurdumyz gün – günden gözelleşýär, halkymyz ýyl – ýyldan baýlaşýar." [Our country is becoming more beautiful day by day, and our people are getting richer year by year.]. This construction is likely used to express pride or optimism about the development of the country and its people. It is often found in a patriotic or celebratory context in the corpus. The abstract atypical comparatives, on the other hand, are used to express more subjective and culturally significant ideas. For example, "Ýelden ýyndam bedewlerimiz bar." [We have horses that are faster than the wind. Intended: We have horses with a very fast speed.].

In conclusion, the differences are manifested in the preference for synthetic or analytic typical forms and the distribution between concrete and abstract atypical forms. Understanding these disparities is crucial for a comprehensive grasp of how each language functions in different communicative contexts.

4.2 Semantic features for similarities and differences in typical and atypical comparative constructions across English, Chinese, Russian, and Turkmen

This section examines the semantic features in typical and atypical comparatives in target languages, focusing on how these languages encode the similarities and differences in semantics.

TABLE 2 Differences in the frequency of typical and atypical comparative constructions in English, Chinese, Russian, and Turkmen.

Languages	Typical comparative constructions		Atypical comparative constructions	
	Synthetic	Analytic	Concrete (objective-based comparison)	Abstract (subjective-based comparison)
English	171,148 (75.3%)	54,060 (24.7%)	619 (88%)	81 (12%)
Chinese	119,569 (67.4%)	57,832 (32.6%)	78 (91%)	8 (9%)
Russian	160,753 (98.55%)	1854 (1.45%)	494 (95%)	27 (5%)
Turkmen	13,092 (70.72%)	5,421 (29.3%)	56 (81%)	13 (19%)

4.2.1 Semantic features for similarities

4.2.1.1 Similarities in deletion occurrences in typical comparative constructions in English, Chinese, Russian, and Turkmen

The comparative deletion in semantics in typical comparative constructions in the mentioned languages exhibits considerable similarities. Descriptively, comparative deletion[2] refers to the process whereby the comparative constituent from the comparative clause is eliminated when it is identical to that of the main clause (Bhatt and Pancheva, 2007). For instance, in English (1) and Russian (2) examples, the identical constituents in the latter clause can be eliminated under identity with the former one:

1. a. John is taller than Mary is tall.
   b. John is taller than Mary.

2. a. Вася был умнее, чем Петя был умный. (Grashchenkov and Lyutikova, 2017, p. 131)
   V. nom was smart.comp. Than P.nom. Was smart.masc.
   b. Вася был умнее, чем Петя.
   V. nom was smart.comp. Than P.nom.
   Vasya was smarter than Petya.

Luo (2017a) contended that in Chinese comparative constructions involving 比*bi*, the gradable predicate in the main clause undergoes a deletion procedure on account of the identity of the gradable predicate in the comparative clause, as illustrated below:

3. [$_{TP1}$[$_{comparative\ target}$梁龙[$_{gradable\ predicate}$高]]比[$_{TP2}$[$_{comparative\ standard}$霸王龙[$_{gradable\ predicate}$高]]。 (Luo, 2017a, p. 331)

The comparative construction emerged as a result of (3) deletion, as illustrated below in (4):

4. 梁龙比霸王龙高。

   Liáng lóng bǐ bàwáng lóng gāo.
   Diplodocus is taller than Tyrannosaurus rex。

In Turkmen, analogs to other languages, deletion eliminates the comparative constituents from the matrix clause when they are semantically equivalent to the comparative clause. For example:

5. Ol aýal doganyny [gowy görýär]-dan erkek doganyny (has) gowy görýär. (Annamyradova, 2024, p. 375)

   He sister.3poss.acc [love.present]abl. brother.sg.3poss.acc (more) love.present.
   He loves his brother (more) than [he loves] his sister.

As demonstrated by the examples in the target languages mentioned above, a comparative deletion takes place when an identical part exists in either the matrix or the comparative clause, and it is deleted due to the congruence.

In conclusion, in English, Chinese, Russian, and Turkmen, typical comparative constructions, the deletion phenomena can similarly occur due to the semantic equivalence between the main and comparative clauses.

4.2.1.2 Similarities in the atypical comparatives in English, Chinese, Russian, and Turkmen

In light of the atypical semantic features, the comparative constructions in English, Chinese, Russian, and Turkmen all center around the typical comparative constructions.

Languages possess typical comparative constructions which are utilized to express the degree sequence of a certain attribute among at least two comparison participants (Stassen, 1985). In English, Chinese, Russian, and Turkmen, based on this foundation, the semantics of comparatives can be extended following their own language's internal rules and cognitive language system. For instance, the semantic features of the atypical comparative constructions in English typically involve indicating the degree of attributes of the participant in two dimensions (Dixon, 2005). Dixon contends that comparative constructions with such characteristics are atypical comparative constructions (2005:9). For example:

6. Kim is more short than fat. (COCA)
7. The above example demonstrates that the semantic feature of the atypical English comparative construction indicates a two-dimensional degree description, where two gradable predicates, "short" and "fat" are measured in degree for the comparison participant, "Kim."

The atypical comparative constructions in Russian are similarly two-dimensional. For instance:

8. Бумага скорее кремовая чем белая. (RNC)

   Paper More cream-colored.fem.than.white.
   The paper is more cream-colored than white.

In the aforementioned examples, "скорее" (rather, more) serves as an analytic degree marker that measures the degree of the two gradable predicates, "кремовая" (cream-colored) and "белая" (white), for the comparison participant, "Бумага" (paper).

In Chinese, it is common for atypical comparative constructions to be expressed by building upon the typical ones. For instance:

9. 我们做得很细的, 做了个假的结婚证书, 比真的结婚证书还要真。 (CCL)

   Wǒmen zuò dé hěn xì de, zuòle gè jiǎ de jiéhūn zhèngshū, bǐ zhēn de jiéhūn zhèngshū hái yào zhēn.
   We did it very meticulously, we crafted a counterfeit marriage certificate that was more authentic-looking than the genuine one.

In (9), through the comparison between participants 真的结婚证 *zhēn de jié hūn zhèng* (a real marriage certificate) and 假的结婚证书*jiǎ de jié hūn zhèng* (a fake marriage certificate), the conceptualized traits of the former are extended to the latter, also representing an exaggeration to emphasize the similarity of the fake certificate compared to the real one.

Chinese atypical comparatives also incorporate words related to time and numeral-classifier words. For instance:

10. 这些捉蚂蚱的孩子一年比一年大。 (CCL)

2 Refer to Bresnan (1973, 1975), Corver (1997), Izvorski (1996), Lechner (2004), Kennedy (1999, 2002, 2007, 2007a) for further details.

Zhèxiē zhuōmǎzhà de háizǐ yīnián bǐ yīnián dà.
These children who catch grasshoppers are getting older year by year.

11. 他们班的同学一个比一个认真。(CCL)

Tāmen bān de tóngxué yīgè bǐ yīgè rènzhēn.
The classmates in their class are more serious than one another.

In the aforesaid examples, 一年比一年*yīnián bǐ yīnián* "year by year" and 一个比一个*yīgè bǐ yīgè* "one is than another" are terms denoting time and quantity. Through the notions of time and quantity, the gradual alterations of the comparative participants are distinctly indicated. The comparative participant, namely 捉蚂蚱的孩子*zhuōmǎzhà de háizǐ* "the children who catch grasshoppers" intensifies the degree of age through the passing time; and the group of comparison participants, 他们班的同学*Tāmen bān de tóngxué* "the classmates in their class," gauges the meaning of the comparison *via* numeral-classifier word on their actual performance.

In Turkmen, employment of words related to time in comparative constructions can add semantic details to the comparison, and the use of exaggeration can enhance the expressiveness of the comparison. For instance:

12. Ýurdumyz gün-günden gözelleşýär, halkymyz ýyl-ýyldan baýlaşýar. (Self-built corpus)

Country.1.pl.poss. Day.day.abl.become beautiful.present. people.1.pl.poss. Year.year.abl.get rich.present.
Our country is becoming more beautiful day by day, and our people are getting richer year by year.

13. Ýelden ýyndam bedewlerimiz bar. (Self-built corpus)

Wind.abl.fast horse.1.pl.poss.have.
We have horses faster than the wind.

The example (12) depicts that the comparison participants "Ýurdumyz" (Our country) and "halkymyz" (our people) convey the significance of gradual alteration through the time lexemes "gün-günden" (day by day) and "ýyl-ýyldan" (year by year), representing a concept of the progressive intensification of the comparison participants. In (13), a comparison is conducted between the abstract comparison participant "Ýel" (wind) and the concrete comparison participant "bedew" (horse). It is indicated that the concrete comparison participant "bedew" (horse) possesses a higher degree of speed than that of "Ýel" (wind). This example represents the precise rated meaning of the comparison.

In summary, the semantic features of atypical comparatives in English, Chinese, Russian, and Turkmen all revolve around the typical comparative constructions from the multiple perspectives: *via* two-dimensional degree of description, words indicating time and numeral-classifier words, and the use of exaggeration can enhance the emphasis of the comparison.

4.2.2 Semantic features for differences

4.2.2.1 Differences for the semantic features in typical comparative constructions in English, Chinese, Russian, and Turkmen

The significant variations in the semantic features in typical comparative constructions across target languages reside in the expression forms of their degree semantics. There are two forms of degree expression in the typical comparative constructions in English, Chinese, Russian, and Turkmen: explicit and implicit. The degree expression in the typical comparative constructions in English and Russian is explicit, whereas that in Chinese and Turkmen is implicit.

Drawing upon the previous literature on the semantic feature of comparison, we adopt the common view that gradable adjectives denote relations between degrees and individuals (Heim, 2000; Alrenga et al., 2012). For instance, the English gradable adjective "happy" represents the following meaning:

14. [[happy]] = λdλx.happy(x) ≥ d (Alrenga et al., 2012, p. 33)

Alternatively, in the field of comparative semantics, the formation of a comparative meaning is typically accomplished through the use of comparative degree morphology, where the function of the degree marker is to emphasize the degree of relationship g < d,e t > between at least two compared objects on a specific gradable predicate (Kennedy, 1999, 2007a, 2007b; Zhang and Ling, 2021):

15. $[[-\text{er/more}_{\text{degree}}]] = \lambda d\lambda g\langle d,e\ t\rangle \lambda x.\max(g)(x) > d$

The aforementioned degree semantics in the typical comparative constructions in English and Russian are expressed *via* explicit degree markers, "-er/more" and "-ee/e/более" respectively. The following are instances demonstrating explicit degree semantics in English and Russian, respectively:

16. a. She is faster than Tom. (COCA)
    b. She is more beautiful than Sara. (COCA)

17. a. Понимаю, что советовать легче чем добиться желаемого. (RNC)
    Understand.1.sg.pres.what advise.inf. Easy.comp. Than achieve.inf. Desired.gen.
    I understand that it is easier to advise than to achieve the desired (outcome).
    b. Он более равнодушный, чем его отец. (RNC).
    He more apathetic.sg.masc. Than his father.
    He is more apathetic than his father.

However, the phenomenon where the gradable predicate possesses no degree marker whatsoever is a highly common strategy for expressing comparisons in world languages (Alrenga et al., 2012). For instance, the typical comparative constructions in Chinese and Turkmen do not utilize an explicit degree marker. Luo (2017a,b, 2021) contended that the standard marker 比*bi* indicates the asymmetrical temporal relationship between two degrees within the Chinese comparative constructions. Similarly, the typical comparative constructions in Turkmen mainly rely on the ablative case marker "-dan" (from) to express the semantics of the comparison (Annamyradova, 2024). For example:

18. 他比我矮。 (CCL)
    Tā bǐ wǒ ǎi.
    He is shorter than me.

19. Maral menden uzyn. (Self-built corpus)
    M.nom. Me.abl. Tall.
    Maral is taller than me.

As can be seen from the examples presented above, the degree markers in typical comparative constructions of Chinese and Turkmen are predominantly employed implicitly.

In summary, there are two types of degree expression forms in the semantics of the typical comparative constructions in English, Chinese, Russian, and Turkmen: explicit and implicit. The degree of expression in the typical comparative constructions in English and Russian is explicit, whereas in Chinese and Turkmen, it is implicit.

4.2.2.2 Differences for the semantic features in atypical comparative constructions in English, Chinese, Russian, and Turkmen

The semantic differences in atypical comparative constructions in English, Chinese, Russian, and Turkmen lie in how they encode concrete (objective-based) and abstract (subjective-based) comparisons. These constructions can be categorized into two semantic types: (1) concrete, which relies on literal, measurable attributes, and (2) abstract, which involves interpretive, evaluative, or metaphorical meanings.

1. Consider the examples of objective-based concrete comparatives in English, Russian, Chinese, and Turkmen, respectively:
20. She is more lean than muscular. (COCA)
21. Он более высокий, чем сильный. (RNC)
    He more tall.masc.sg. Than stong.masc.sg.
    He is more tall than strong.
22. 这座城市新建的高楼一个比一个高。
    zhè zuò chéng shì xīn jiàn de gāo lóu yī gè bǐ yī gè gāo.
    The newly built skyscrapers in this city are taller one than another.
23. Çaga gün-günden ulalýar. (self-built corpus)
    Baby.sg. day-day.abl. Grow.pres.
    The baby is growing bigger day by day.

Example (20) is comparing two physical characteristics of the referent "She." The adjectives "lean" and "muscular" describe objective physical attributes that can be observed and measured to some extent. The usage of the construction "more…than" objectively presents a comparison between the degrees to which these two attributes are manifested in the referent "Kim," suggesting that the attribute of being lean is more prominent than the attribute of being muscular.

The sentence (21) compares two physical attributes, "высокий" (tall) and "сильный" (strong), which can be objectively observed. By employing the construction "более…чем" (more…than) (though context dependent and semantically limited), it can be objectively indicated that the comparison between degrees of attributes "высокий" (tall) and "сильный" (strong) is manifested in the referent "Он" (he).

The Chinese example (22) implies a dynamic, step-by-step comparison within a sequence of entities (A_1, A_2, A_3, …, A_n), where each subsequent member exceeds the previous in the described property: $A_1 < A_2 < A_3 < \ldots < A_n$. For example, "一个比一个高" means "each one is taller than the one before it," forming an incremental progression. Unlike typical comparatives [e.g., "B比A高" (B is taller than A)], which use an external fixed standard, this structure uses the preceding member as the comparative reference for the next, focusing on relative differences within the set rather than an absolute standard.

In Turkmen example (23), "ulalýar" (growing) functions here as a self-comparative, contrasting the baby's (Çaga) state at time t_n with t_{n-1}, not with another entity. This is a non-binary comparative, focusing on intra-entity change rather than inter-entity difference.

In concrete, atypical comparatives in target languages, English and Russian, that are atypical comparative constructions are dual attribute comparisons. They compare two attributes of the same entity. Chinese and Turkmen atypical comparative constructions are iterative comparisons. They compare multiple entities in a sequence.

2. Beyond the concrete manifestations of atypical comparison, the target languages are capable of expressing subjective-based abstract comparative constructions. Take the examples below into consideration:
24. Their relationship is more transactional than loving. (COCA)
25. Знание охотника —— скорее терпение чем знание. (RNC)
    Knowledge hunter.gen. More patience than knowledge.
    A hunter's knowledge is more patience than knowledge.
26. 他们比道家还要道家, 比佛家还要佛家。 (CCL)
    Tāmen bǐ dàojiā hái yào dàojiā, bǐ fó jiā hái yào fó jiā.
    Lit:They are more Taoist than Taoist, and more Buddhist than Buddhist.
27. Galamy gylyçdan ýiti şahyrymyz Magtymguly. (Self-built corpus)
    Pencil.acc. Sword.abl.sharp poet.3.pl.poss. M.nom.
    Lit: Our poet Makhtumkuli who has a pencil (poems) sharper than a sword.

In the aforementioned English example (24), two attributes, "transactional" and "loving," on single entity "relationship," are subjectively evaluated, and the degree marker "more" precisely reveals the degree of disparity between these two attributes. In the Russian sentence (25), two attributes, "терпение" (patience) and "знание" (knowledge), are subjectively evaluated in the same entity "Знание охотника" (the knowledge of the hunter), and the degree marker "скорее" (rather) specifically conveys the degree variance. These two examples in English and Russian reflect a subjective judgment. They imply as follows: "Rather than being "Attribute$_2$," X is primarily "Attribute$_1$."

In the Chinese sentence (26), the comparative participant 他们 Tāmen (they) is being compared abstractly to the concepts of 道家*dàojiā* (Taoist) and佛家*fójiā* (Buddhist) in terms of resembling their characteristics to an extreme degree. Here, the attributes 道家*dàojiā* (Taoist) and 佛家 *fó jiā* (Buddhist) do not signify their literal senses but rather the qualities associated with these two attributes, such as the tranquility, inaction, and nature of Taoism, and the wisdom, integrity, and kindness of Buddhism, which are rather abstract connotations. Alternatively, in the Turkmen example (27), the term "galam" (pencil) pertains to the poems, and the concept of "ýiti" (sharp) implies the cutting and powerful nature of the words utilized in the poems. It is a creative and figurative way of expressing the impact and strength of the poet's words through an abstract comparison.

In abstract, atypical comparatives in target languages, English and Russian, are atypical comparative constructions, subjectively evaluate

two attributes of the same entity. Chinese in intra-entity category intensification (比X还要X), emphasizing adherence to an abstract category's essence ("道家", "佛家" (Taoist, Buddhist)). Turkmen relies on metaphorical inter-entity comparisons (e.g., pencil > sword), blending concrete imagery with abstract meaning.

In summary, the semantic differences in atypical comparative constructions in English, Chinese, Russian, and Turkmen lie in how they encode concrete (objective-based) and abstract (subjective-based) comparisons.

5 Cognitive interpretations for the similarities and differences in typical and atypical comparative constructions in English, Chinese, Russian, and Turkmen

In this section, the cognitive interpretations for the similarities in typical and atypical comparative constructions will be illustrated from the perspective of human cognition with reliance on the prototypical theory (Rosch, 1973), and the cognitive interpretations for the differences in typical and atypical comparative constructions in the mentioned languages will be elucidated from the viewpoints of construal theory (Langacker, 2008) in cognitive linguistics.

5.1 Cognitive interpretations for similarities in typical and atypical comparative constructions in target languages

The cognitive rationales for the similar characteristics in typical and atypical comparative constructions in the aforementioned languages, as shown from the study, are mainly reflected in human cognition toward comparatives.

Prototype theory (Rosch, 1973) has furnished specific rationales to postulate that a considerable number of natural lexical category structures are graded, with typical members having higher compatibility. For instance, typical comparative constructions in English "X - er/more Y than Z," in Chinese "X比Y Z," in Russian "X -e/—ее/более Y чем Z," in Turkmen "X Y-dAn Z (—rAk) are more prototypes in the "comparison" grammar category than atypical comparative constructions "X more Z_1 than Z_2" in English and Russian, "一个比一个Z," "比X还要X" in Chinese, "gün-günden" (day by day) construction in Turkmen. Atypical comparative constructions can be understood within the framework of comparison; however, they cannot be classified as prototypical comparative constructions since they exhibit fewer similarities in terms of formation, as shown from the analyses in the previous section (see Figure 1). As shown in Figure 1, the typical comparisons within the target languages are contained within the red circle. These typical comparisons involve two comparative participants related to a single attribute in terms of degree. Alternatively, the atypical comparatives are those that are outside the core circle expanded based on the typical comparative constructions (Haspelmath, 2003). As shown from the analysis, the human cognition regarding these two types of comparative constructions remains the same since human cognition toward the atypical comparisons is similar to that of the typical ones.

In conclusion, the cognitive interpretations for the similarities in typical and atypical comparative constructions across English, Chinese, Russian, and Turkmen are chiefly demonstrated in human cognition regarding comparatives.

5.2 Cognitive interpretations for differences in typical and atypical comparative constructions in English, Chinese, Russian, and Turkmen

As shown in the study, the typical and atypical comparative constructions in English, Chinese, Russian, and Turkmen have notably different cognitive interpretations. The present study holds that they mainly comprise the differences in various construal modes. Langacker (2008, p. 96) asserts that the content is akin to a scene, and

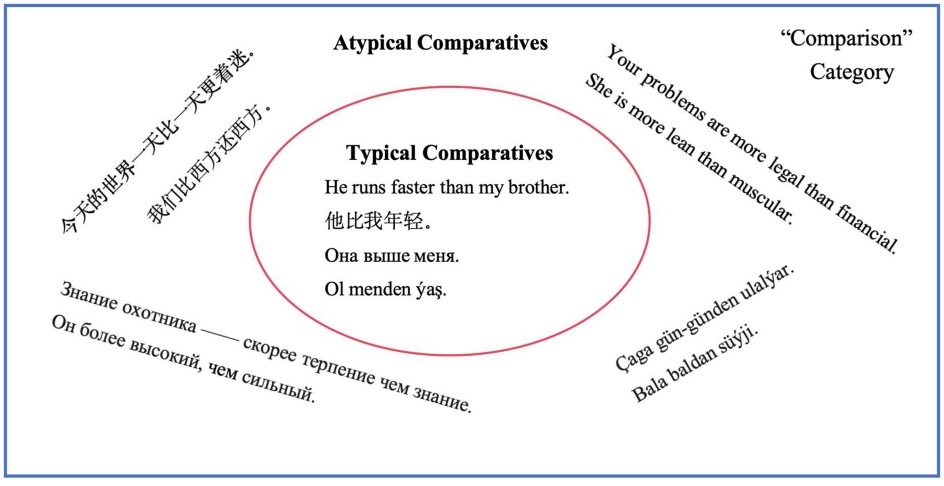

FIGURE 1
Membership of the graded class of comparative constructions in English, Chinese, Russian, and Turkmen.

construal is a particular means of observing this scene, namely, the subjective selection of the conceptual content by the conceptualizing subject throughout the process of language expression. Langacker's construal theory (2008, p. 55) encompasses four dimensions: salience, focusing, specificity, and perspective, and this section primarily elaborates on the differences from the dimensions of salience and specificity.

5.2.1 Differences in salience

Langacker believes that language structures present various asymmetries, and these asymmetries are reasonably regarded as "salient" matters (2008, p. 66). "Salience" includes profiling and trajector/landmark combinations. Consider the examples in English, Chinese, Russian, and Turkmen, respectively:

28. He is smarter than me. (COCA)
29. 他比我高。 (CCL)
    Tā bǐ wǒ gāo.
    He is taller than me.
30. Она красивее меня. (RNC)
    She pretty.comp. Me.gen.
    She's prettier than me.
31. Ol menden ýaş. (Self-built corpus)
    He me.abl. Young.
    He is younger than me.

In English (28) and Russian (30) examples, the main clauses of the comparative constructions, respectively "He is smarter" and "Она красивее" (she is prettier), are salient. The degree differences of the comparative targets are intensified, highlighting the degree of disparity in the gradable predicates. The comparative targets "He" and "Она" (she) are foregrounded, while the comparative standards "me" and "меня" (me) are backgrounded. "He" and "Она" (she) become trajectors, and "me" and "меня" (me) become landmarks, and the meaning of the typical comparison is profiled. In Chinese (29) and Turkmen (31) examples, the comparative clauses, respectively 比我高*bǐ wǒ gāo* (taller than me) and "menden ýaş" (younger than me) are salient. The comparative standard 我*wǒ* (me) and "men" (me) are foregrounded, while the main clauses 他*Tā* (he) and "Ol" (he) are backgrounded. Comparative standards我*wǒ* (me) and "men" (me) become trajectors, and comparative targets 他*Tā* (he) and "Ol" (he) become landmarks, and the meaning of the typical comparative construction is profiled.

In brief, the typical and atypical comparative constructions in target languages exhibit strikingly marked differences in their salience of construal modes. English and Russian lay greater salience on the main clauses of the comparative constructions, while Chinese and Turkmen place more salience on the comparative clauses.

5.2.2 Differences in specificity

Langacker (2008, p. 55) defined specificity in the construal theory as the precise and detailed extent to which a certain situation is depicted. For the comparative constructions in English, Chinese, Russian, and Turkmen, their specificity is primarily manifested in the degree semantics of the gradable predicates. Take the examples into consideration in English and Russian, respectively:

32. a. She is taller than me.
    b. George is more dumb than crazy.
33. a. Советовать легче чем добиться желаемого.
    Advise.inf. Easy.comp. Than attain.inf. Desired.gen.
    It is easier to advise than to attain the desired (outcome).
    b. Знание охотника — скорее терпение чем знание.
    Knowledge hunter.gen. More patience than knowledge.

The knowledge of the hunter is rather patience than knowledge.

Typical and atypical comparative constructions in English (32a,b) and Russian (33a, b), the degree semantics are expressed explicitly through the degree markers "-er/more" and "-e/скорее," allowing for more specific descriptions for participants on gradable predicates.

Meanwhile, in Chinese and Turkmen, within typical and atypical comparative constructions, there exists a tendency for degree semantics to be described implicitly, which enables them to be presented in a more schematic manner. For example:

34. a. 他的成绩比我好。
    Tā de chéngjī bǐ wǒ hǎo.
    His grades are better than mine.
    b. 我们对这个问题的理解一次比一次深入。.
    Wǒmen duì zhège wèntí de lǐ jiè yīcì bǐ yīcì shēnrù.
    Our understanding of this issue is deeper and deeper each time。
35. a. Bu gün howa düýnkiden sowuk.
    This day weather yesterday.poss.abl. Cold.
    Today's weather is colder than yesterday's.
    b. Bala baldan süýji.
    Baby honey.abl. Sweet.
    The baby is sweeter than honey.

As is evident from the examples of typical and atypical comparative constructions in Chinese (34a, b) and Turkmen (35a, b), the degree meanings of gradable predicates 好*hao* (good), 深入*shenru* (deep) and "sowuk" (cold), "süýji" (sweet) are implicitly expressed.

In brief, typical and atypical comparative constructions in English, Chinese, Russian, and Turkmen display strikingly diverse differences in the specificity of their degree semantics. The degree semantics of the gradable predicate in English and Russian comparative constructions are specific. Conversely, in Chinese and Turkmen comparative constructions, there is a propensity for the degree semantics to be presented in a more schematic manner.

5.3 Summary of the results

This study systematically examines typical and atypical comparative constructions across English, Chinese, Russian, and Turkmen, revealing universal cognitive patterns and language-specific divergences in their pragmatic and semantic features.

Across all languages, prototypical comparative forms (e.g., English "X - er/more Y than Z," in Chinese "X比Y Z," in Russian "X -e/−ee/более Y чем Z," in Turkmen "X Y-dAn Z (−rAk)) constitute over 99% of usage, reflecting their cognitive primacy as efficient, regularly structured tools for encoding scalar relationships (aligned with prototype theory).

Russian (98.55% synthetic) and English (75.3% synthetic) favor suffixal or adverbial markers (−e/−ee, −er/more), leveraging inflectional or hybrid morphological systems.

Chinese (32.6% analytic) and Turkmen (29.3% analytic) rely on prepositional markers (比 bǐ) or case marking (−dan), aligning with their isolating/agglutinative typologies.

Atypical comparatives are rare but functionally specialized (0.05–0.37% frequency), they serve metaphorical (e.g., Turkmen "poems sharper than a sword") or iterative purposes (e.g., Chinese 一天比一天好"day by day better"), with English and Russian using them slightly more frequently than Chinese and Turkmen.

Semantically, English and Russian employ overt degree markers to enable explicit scalar distinctions (e.g., taller, более высокий), prioritizing semantic clarity.

Chinese and Turkmen use implicit encoding *via* context or case marking requires pragmatic inference (e.g., 比 bǐ in Chinese, ablative -dan in Turkmen), reflecting reliance on shared contextual knowledge.

Atypical comparatives in English and Russian emphasize concrete, dual-attribute comparisons (e.g., more speed than stamina), while Chinese/Turkmen favor iterative ("each taller than the last") or metaphorical extensions tied to holistic cognitive styles.

Typical comparatives act as cognitive anchors, with atypical forms extending the category through metaphor or abstraction.

In English and Russian, comparatives foreground the trajector (e.g., "He is smarter"), emphasizing the subject's superiority in main clauses.

In Chinese and Turkmen, comparatives highlight the comparative standard (e.g., 比我 "than me"), backgrounding the subject to stress relational contrasts, aligning with collectivist communicative norms.

All languages exhibit comparative deletion, but structural differences mirror typological traits (e.g., Russian's inflectional compactness vs. Chinese's analytic transparency).

The study validates prototype theory for category centrality and construal theory for language-specific semantic framing, enriching cognitive linguistic models of comparison.

The study informs L2 pedagogy (e.g., targeting implicit/explicit encoding challenges) and NLP development (e.g., improving case-based comparative translations in Turkic languages).

By linking grammatical structures to cognitive strategies, this study advances cross-linguistic typology, underscoring the balance between universal cognitive mechanisms and language-specific adaptations in comparative systems.

6 Discussion

This study provides a systematic contrastive analysis of pragmatic and semantic features in typical and atypical comparative constructions across English, Chinese, Russian, and Turkmen, anchored in cognitive linguistic frameworks. Below, we synthesize the key findings, their theoretical implications, and avenues for future research.

6.1 Pragmatic patterns and typological implications

The data revealed a universal preference for typical comparatives across the target languages (e.g., English "X - er/more Y than Z," in Chinese "X比Y Z," in Russian "X -e/−ee/более Y чем Z," in Turkmen "X Y-dAn Z (−rAk)), constituting over 99% of comparative usage. This dominance aligns with prototype theory (Rosch, 1973), where typical forms act as cognitive anchors due to their structural regularity and efficiency in encoding scalar relationships. Atypical comparatives, while less frequent, served specialized functions, such as metaphorical evaluations (e.g., Turkmen "Galamy gylyçdan ýiti…" ["A pen sharper than a sword…"]) or iterative comparisons (e.g., Chinese *一天比一天好* ["Better day by day"]).

In our study, cross-linguistic differences emerged in synthetic and analytic forms of typical comparative constructions.

Typical comparatives in Russian heavily favored synthetic markers ("-e/−ee"; 98.55%), reflecting its inflectional morphology. Typical comparatives in Chinese and Turkmen employed both synthetic (e.g., 比 (67.4%); −dan (70.72%)) and analytic [e.g., X比Y 更 (more) Z (32.6%); −dan has (more) Z (29.3%)] strategies for nuanced comparisons. Typical comparatives in English displayed a hybrid system, balancing synthetic [−er; (75.3%)] and analytic [more; (24.7)] forms.

These patterns underscore how typological traits, such as morphological complexity (Russian) or isolating structures (Chinese), shape pragmatic preferences.

6.2 Semantic features and cognitive underpinnings

The study revealed that degree semantics in typical and atypical comparative constructions in target languages diverged markedly. In English and Russian, comparative constructions employ explicit encoding *via* overt degree markers (−er/more in English; −e/−ee/более in Russian), thereby enabling precise scalar distinctions. In contrast, Chinese and Turkmen use implicit encoding strategies, relying on context (e.g., the standard marker 比 bi) or case marking (e.g., the Turkmen ablative -dan), which require interlocutors to draw inferential connections.

Atypical comparatives in English, Chinese, Russian, and Turkmen further highlighted contrasts in concreteness and abstraction. English and Russian atypical comparatives prioritized concrete, dual-attribute comparisons ("She is more lean than muscular"; "Он более высокий, чем сильный." (He is more tall than strong.)). Chinese and Turkmen atypical comparatives favored iterative or metaphorical extensions [e.g., 一个比一个高 (Each taller than the last); "Ýelden ýyndam bedewlerimiz" (Horses faster than the wind)].

These differences align with construal theory (Langacker, 2008). English and Russian comparative constructions foregrounded salience in main clauses (e.g., "He is smarter [than me]" in English; "Она красивее [меня]" (she is prettier [than me]), emphasizing the trajector's superiority. Conversely, Chinese and Turkmen highlighted the comparative standard clause (e.g., "比我高 bi wo gao" [taller than me]) in Chinese; "baldan süýji" [sweeter than honey] in Turkmen), backgrounding the trajector to stress relational contrasts.

6.3 Theoretical implications

The overwhelming dominance of prototypical comparative forms (e.g., English X-er/more Y than Z, Chinese X比Y Z)—constituting over 99% of usage across languages—empirically validates Rosch's (1973) prototype theory, which posits that categories are organized

around cognitively salient core members. These prototypical constructions, characterized by structural regularity (e.g., fixed word order, overt marking of comparison standards) and cognitive efficiency, serve as foundational anchors for encoding scalar relationships (Taylor, 2003). Divergences in salience patterns—English/Russian foregrounding the trajector (e.g., "He is smarter") versus Chinese/Turkmen backgrounding the subject to emphasize the comparative standard (e.g., 比我 "than me")—align with Langacker's (2008) construal theory, which posits that languages "construe" the same semantic relation through distinct attentional focuses. Inflectional languages like Russian leverage synthetic markers (−e/−ee) to encode comparison directly on adjectives, prioritizing subject prominence, while isolating languages like Chinese use prepositional markers (比) to explicitize relational standards, reflecting a typology-driven emphasis on contextual relativity (Croft, 2001). These findings enrich our understanding of how grammatical structure mirrors cognitive perspectives, such as the "viewing angle" from which speakers conceptualize similarity/difference (Talmy, 2000a).

By analyzing four typologically distinct languages (Germanic, Sinitic, Slavic, Turkic), the study expands Comrie's (1988) cross-linguistic typology by revealing nuanced correlations between morphological complexity and comparative strategies. Russian's near-exclusive use of synthetic suffixes (−e/−ee; 98.55%) exemplifies inflectional languages' reliance on morphological compactness, while Chinese's analytic 比-constructions (32.6% of cases) reflect the isolating typology's emphasis on syntactic transparency. Turkmen's agglutinative case marking (−dan), which bridges synthetic and analytic encoding, challenges strict binary classifications, supporting Haspelmath's (2003) argument for continuous typological variation rather than discrete categories. This underscores the need for dynamic models of grammaticalization that integrate cognitive processing and typological heritage (Heine and Kuteva, 2008).

6.4 Practical implications

Findings inform targeted instruction for learners navigating typological contrasts. Learners of inflectional languages (e.g., Russian) benefit from morphological paradigms highlighting synthetic comparatives (сильнее "stronger"), while Chinese L2 learners require guided practice in contextual inference for 比-constructions, where degree is often unmarked (Luo, 2017b).

Advanced curricula for Turkmen or Chinese should incorporate atypical comparatives (e.g., "horses faster than the wind"), as these reflect cultural conceptualizations tied to nomadic or agrarian heritage, enhancing pragmatic competence (Larsen-Freeman, 2018).

The study's focus on Turkmen—an understudied Turkic language—advocates for expanded NLP datasets, as current models (e.g., Google Translate) underperform on case-based comparatives, impacting technical translations (e.g., legal documents) (Haspelmath, 2013).

6.5 Limitations and future research

Although the analysis of pragmatic and semantic features in English, Chinese, Russian, and Turkmen comparatives advances cross-linguistic typology, the study's scope and methodology present specific limitations that inform future inquiry.

The self-compiled Turkmen corpus (N = > 150 million tokens) is skewed toward modern written media (75% news articles, 25% academic texts), excluding oral discourse, regional dialects (e.g., Ersari Turkmen), and historical registers (e.g., Oghuz Turkic influences). This limits generalizability to pragmatic contexts where ellipsis or prosody may modify comparative meaning (e.g., spoken Turkmen's daha stress for emphasis).

The study does not experimentally test how cultural values (e.g., Turkmen hospitality norms) or cognitive load (e.g., working memory demands for implicit inference) influence comparative usage. For example, Russian speakers may avoid analytic comparatives in formal settings due to prescriptive grammar rules (Valentinova and Rybakov, 2019), a sociolinguistic factor absent from the synchronic analysis.

The synchronic focus neglects grammaticalization pathways, such as Chinese 比 bǐ's evolution from a verb ("to compare") to a preposition (Luo, 2017a), or Turkmen-dan's convergence with Persian az ("from") *via* contact-induced change (Badalkhan et al., 2019). Areal influences (e.g., Russian comparatives in Central Asian multilingual communities) remain unexplored.

No psycholinguistic data (e.g., ERP brain responses, reaction times) were collected to validate construal theory predictions, such as whether English speakers process trajector-foregrounded comparatives faster than Chinese speakers interpreting standard-foregrounded 比-sentences.

Given the study's limitations—namely, the restricted Turkmen corpus, lack of sociocultural analysis, and absence of psycholinguistic data—subsequent research will:

1. Expand corpus sampling to include diverse Turkmen registers (spoken, dialectal, historical) to address representativeness gaps;
2. Integrate cultural frameworks (e.g., Hofstede's dimensions) to explore how social norms shape comparative usage;
3. Employ experimental methods (eye-tracking, EEG) to investigate cognitive processing of explicit/implicit comparatives.

These directions would not only address the current gaps but also enrich the theoretical foundations of cross-linguistic comparative research by bridging linguistic structure, cognitive processing, and sociocultural context.

7 Conclusion

This article performs a contrastive study of typical and atypical comparative constructions in English, Chinese, Russian, and Turkmen using a large amount of online corpora for the first three languages and self-established data for Turkmen. It explores the similarities and differences in their pragmatic and semantic features. The similarities are chiefly exhibited in the prominent usage of typical comparative constructions, the occurrence of comparative deletion, and atypical semantic features of comparative constructions based on the typical ones. The differences mainly lie in the preference for typical synthetic or analytic forms and the distribution between concrete and abstract atypical forms, expression forms of degree semantics in typical comparatives, and semantic types of atypical comparatives. In the mentioned languages, there are two types of typical comparatives:

synthetic and analytic. The synthetic type in Russian and the analytic type in Chinese have the highest pragmatic frequency. For atypical comparatives, there are objective-based and subjective-based types. Degree semantics in typical comparatives can be explicit or implicit. In English and Russian, it's mainly explicit; in Chinese and Turkmen, it's mainly implicit. The semantic differences in atypical comparative constructions in English, Chinese, Russian, and Turkmen lie in how they encode concrete (objective-based) and abstract (subjective-based) comparisons. The cognitive interpretations for the similarities of the typical and atypical comparative constructions in the mentioned languages are mainly reflected in human cognition toward comparatives. The cognitive interpretations for the differences of typical and atypical comparative constructions are mainly manifested in the diverse levels of salience and specificity of construal modes in the context of comparison. English and Russian lay greater salience on the main clauses of the comparative constructions, while Chinese and Turkmen place more salience on the comparative clauses. The degree semantics of the gradable predicate within English and Russian comparative constructions are specific. Conversely, in Chinese and Turkmen comparative constructions, there is a propensity for the degree semantics to be presented in a more schematic manner.

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