Morphological Structuring of Search Domains in Turkish Embedded Locative Constructions

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ABSTRACT: This investigation examines the structural mechanisms governing spatial encoding in Turkish nested locative constructions within Langacker's Cognitive Grammar theoretical framework. The morphological system manifests implicit cognitive operations through the complex interplay of case morphemes, relativization structures, and possessive markers. This analysis comprehensively demonstrates how Turkish grammar instantiates multiple search domains, specificity predication, and reference point chaining while preserving conceptual accessibility. Complex nested constructions exhibit systematic processing frameworks that facilitate both hierarchical and sequential interpretation of spatial relationships. Contrastive analysis with English prepositional patterns comprehensively reveals divergent grammatical mechanisms achieving equivalent communicative functions. The findings significantly deepen the theoretical understanding of the interface between grammatical structuring and spatial conceptualization, demonstrating how morphological transparency renders visible cognitive operations that remain implicit in other linguistic systems. This research contributes insights to the literature by providing a detailed explication of how grammatical systems organize spatial complexity through various structural mechanisms while maintaining cognitive accessibility.

Keywords: spatial conceptualization, nested locative structures in Turkish, reference domain, morphological transparency, structural recursion

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ÖZ: Bu araştırma, Langacker'ın Bilişsel Dilbilgisi kuramsal çerçevesinde, Türkçedeki içyerleşik yerlem yapılardaki uzamsal kodlamanın yapısal düzeneklerini incelemektedir. Biçimbilimsel dizge, durum biçimbirimleri, ilgi yapıları ve iyelik belirticilerinin çok katmanlı etkileşimi yoluyla örtük bilişsel işlemleri dizgesel bir biçimde yansıtmaktadır. Bu ayrıntılı çözümleme, Türkçe dilbilgisinin kavramsal erişilebilirliği korurken çoklu arama alanlarını, belirtik yüklemleme ve gönderim noktası zincirlenmesini nasıl örneklendirdiğini kapsamlı bir biçimde ortaya koymaktadır. Karmaşık içyerleşik yapılar, uzamsal ilişkilerin hem hiyerarşik hem de ardışık yorumlanmasını kolaylaştıran dizgesel işlem çerçeveleri sergilemektedir. İngilizce ilgeç örüntüleriyle gerçekleştirilen karşıtsal çözümleme, eşdeğer iletişimsel işlevlere ulaşan farklı dilbilgisel düzenekleri bütüncül biçimde açığa çıkarmaktadır. Bulgular, dilbilgisel yapılanma ile uzamsal kavramsallaştırma arasındaki arayüzün kuramsal kavrayışını önemli ölçüde derinleştirip, biçimbilimsel saydamlığın diğer dil dizgelerinde örtük kalan bilişsel işlemleri nasıl görünür kıldığını ortaya koymaktadır. Bu çalışma, dilbilgisel dizgelerin uzamsal karmaşıklığı çeşitli yapısal düzenekler aracılığıyla nasıl düzenlediğini ve bilişsel erişilebilirliği nasıl koruduğunu ayrıntılı bir biçimde açıklayarak alanyazına özgün katkılar sunmaktadır.

Anahtar sözcükler: uzamsal kavramsallaştırma, içyerleşik konumlanış kurulumlar, gönderim alanı, biçimbilimsel saydamlık, yapısal özyineleme

1 Introduction

The morphosyntactic realization of search domains in spatial constructions reveals complex cross-linguistic patterns that fundamentally challenge established typological categorizations of how languages encode spatial relationships (Talmy, 2003; Levinson, 2003). Whereas traditional theoretical frameworks have conceptualized search domains primarily as bounded spatial regions, this characterization fails to capture the inherently dynamic and context-dependent nature of spatial reference systems. Search domains—understood as regions of conceived space within which a designated target is expected to be

located—reflect "a basic aspect of everyday expression, namely that of finding things in space" (Langacker, 2000, p.53). Although this conceptualization remains largely overlooked in traditional semantic and grammatical analyses, contemporary theoretical approaches necessitate a more comprehensive understanding of search domains as emergent cognitive constructs that mediate between grammatical structure and spatial cognition.

Turkish case system convincingly demonstrates that spatial relationship encoding cannot be adequately analyzed through traditional structural-linguistic frameworks that assume universal cognitive mechanisms for spatial reference. Instead, the empirical evidence indicates that language-specific grammatical architectures profoundly shape both the conceptualization and encoding of spatial relationships, thus requiring theoretical models that can effectively account for the complex interplay between morphosyntactic structure and spatial cognition. Therefore, considering language-specific nature of spatial expressions and their conceptual encodings, a further theoretical reconfiguration demands a fundamental reassessment of how spatial cognition interfaces with grammatical systems across typologically diverse languages.

Langacker's (2008) theoretical framework provides a particularly detailed analytical apparatus for investigating spatial relationships in language. The framework establishes that spatial expressions primarily comprise a trajector (located entity) and landmark (reference entity), with the search domain encompassing the landmark-associated region containing the trajector. An example of such an approach is conceptual analysis of nested locative constructions that are a linguistic phenomenon where multiple locative expressions are used in succession to describe the location of a single entity. The nested or embedded sequences reflects a hierarchy of containment relations between the spatial locations. These constructions demonstrate the psychological reality of spatial conceptualization and its dynamic, flexible nature. The ability to convey distinct construals of the same spatial configuration highlights the role of mental access paths in shaping linguistic meaning. Furthermore, the different ordering of the locatives can convey distinct conceptualizations, like "zooming in" vs "zooming out" on the described scene. Such dynamic and flexible mappings reflect alternate ways of mentally scanning and packaging the described scene which underscores the cognitive mechanisms underlying linguistic expressions of location and containment.

Through a systematic analysis of nested locative constructions, Langacker's (2020) approach reveals the intricate interplay of multiple search domains in encoding spatial relations, also lending support to Slobin's (2004) extensive findings regarding language-specific spatial strategies. Furthermore, the framework's comprehensive integration of semantic and grammatical dimensions makes it especially suitable for examining how distinct grammatical architectures encode spatial relationships through diverse structural means

(Herskovits 1986). While spatial cognition may exhibit certain universal tendencies, its linguistic manifestation is fundamentally mediated by language-specific grammatical resources. Consequently, any cross-linguistic examination of spatial encoding must carefully consider the complex interaction between conceptual structure and grammatical form.

Beyond its methodological value, this theoretical perspective illuminates the cognitive foundations of linguistic spatial representation. The investigation of how grammatical elements construct and constrain spatial conceptualization reveals language's fundamental role in shaping human spatial understanding. The framework's analytical tools align with the broader objective of exploring the relationship between grammatical structures and cognitive representation. By situating spatial language within this comprehensive theoretical landscape, researchers can uncover the organizing principles that transcend individual language systems, offering insights into both universal and language-specific aspects of spatial cognition.

This study examines how Turkish morphology governs the construction and delimitation of search domains in nested locative expressions. Building on Göksel and Kerslake's (2011) analysis of Turkish morphosyntax, it investigates how the Turkish case system interfaces with relativizing morphology to establish spatial reference points and encode relationships across multiple domains. The current research focuses on the interaction between the locative case marker -DA and the relativizer -ki in establishing and connecting spatial reference points. Through examination of naturalistic data comprising of both simple and complex nested locatives, it establishes how Turkish morphological elements work together to generate precise spatial reference through progressive domain restriction (Talmy 2000). Likewise, the documented patterns provide evidence for how grammatical systems explicitly encode conceptual structures in spatial reference (Levinson 2003). Situated within theoretical framework from Herskovits' (1986) analysis of spatial relations and Levinson et al.'s (2003) cross-linguistic work, this research shows how agglutinative morphology can make explicit the conceptual relationships underlying spatial reference. Furthermore, extending Langacker's (2020) analysis of nested locatives, it reveals how idiosyncratic features of the Turkish morphological system provide overt marking of the conceptual organization proposed in his framework.

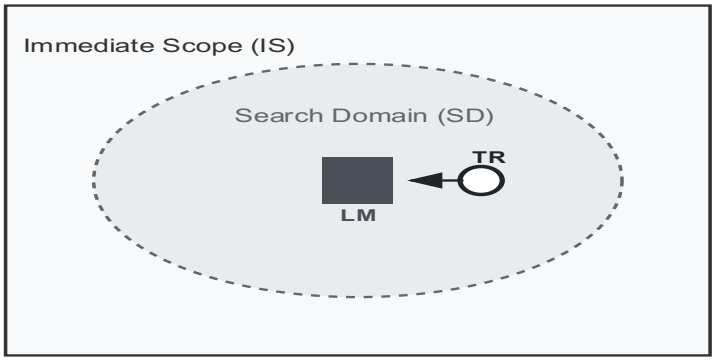
2 Theoretical Framework

Langacker (2008, 2020) proposes a cognitive architecture for spatial conceptualization through systematic relationships between spatial reference components. The model's tripartite structure, presented in Figure 1, reveals organizing principles that show how grammatical systems encode spatial relationships via hierarchically embedded conceptual domains. The first building

block is the immediate scope (IS) that serves as the primary cognitive frame, establishing maximal boundaries for spatial reference conceptualization. This outer delimitation, represented through rectangular boundary in Figure 1, postulates the foundational cognitive domain from which more specific spatial relationships emerge. The IS thus functions as a conceptual substrate, constraining possible spatial relationships and offering cognitive scaffolding for precise spatial specifications. Within this broader cognitive domain, the search domain (SD) emerges as a more constrained region of conceptual space, marked by dotted elliptical representation. This intermediate structural level mediates between broad spatial conceptualization and specific referential anchoring. The SD's association with a specific landmark (LM) shows how cognitive systems establish reference points through systematic domain restriction, highlighting the connection between grammatical marking and spatial cognition.

The landmark-trajector relationship represents the most specific level of spatial reference within this architecture. The landmark (LM), shown as a solid square, serves as the primary reference point, while the trajector (TR), depicted as a white circle with directional specification, indicates the target entity whose spatial coordinates are determined relative to the landmark. This binary relationship operates within the constraints of both the immediate scope and search domain, demonstrating how spatial reference emerges through multiple levels of cognitive domain restriction. The model uncovers spatial conceptualization as a process of embedding increasingly specific reference domains, with each level (layer) contributing essential constraints to spatial relationship specification.

Figure 1. Basic components of spatial relationships based on Langacker's Model



Integrating Talmy's (2000) spatial configuration analysis with Herskovits' (1986) framework exposes how linguistic systems encode complex spatial relationships, as demonstrated in Figure 2. Talmy's bifurcated model—comprising of static configuration and dynamic access—uncovers the cognitive

principles underlying spatial reference construction. Static configuration, manifested in the spatial arrangement of trajector and landmark, establishes reference points within the cognitive domain. The dynamic access mechanism, shown through directional specification, reveals cognitive pathways through which spatial relationships achieve conceptual resolution. Herskovits' framework expands this analysis by examining how locative expressions generate interconnected search domains. The hierarchical embedding of search domains within broader immediate scope make path to sophisticated patterns of cognitive organization, where structural relationships emerge through systematic patterns of overlap and containment. The overall process exemplifies linguistic encoding of complex spatial relationships through scaffolding domain restriction. The scope predication framework advances this understanding by illuminating the management of hierarchically organized spatial relationships. Given the sentence, "the document is in the folder on the desk in the room", the nested structure exemplified in successive landmarks and their search domains—room (LM1/SD1), desk (LM2/SD2), folder (LM3/SD3)—demonstrates cognitive mechanisms for progressive spatial restriction. Each landmark defines its search domain (interior for 'in', upper surface for 'on') establishing more constrained referential spaces, culminating in specific trajector location. The relationships between domains show insights about cognitive accessibility between hierarchically arranged landmark-search domain pairs.

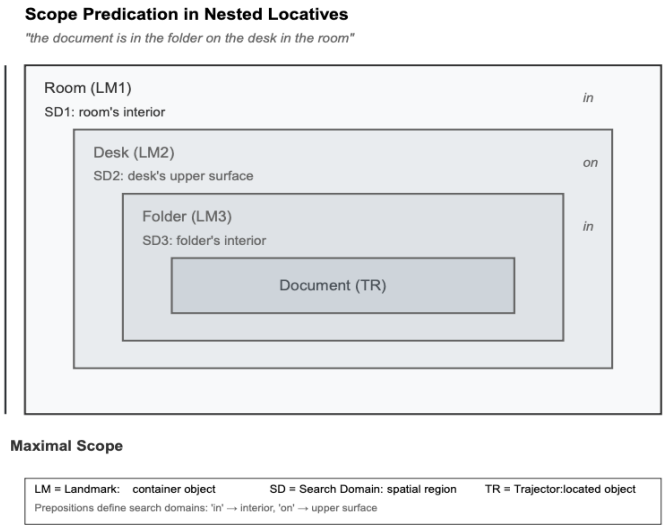


Figure 2. Nested search domains in scope predication: Progressive spatial restriction from room (SD1) to desk (SD2) to folder (SD3), locating document (TR)

Levinson and Wilkins' (2006: 15-32) cross-linguistic analysis of containment relationships clarify the fundamental principles governing the marking of spatial relationships across embedded domains. The documented preservation of distinct domain boundaries within larger spatial configurations expands Herskovits' (1986) theoretical framework regarding referential coherence across multiple embedded spatial fields. The systematic organization of cognitive activation patterns in reference point chains demonstrates processing mechanisms in spatial conceptualization. For instance, in Figure 3, the sequential progression through reference points (RP1, RP2, RP3) uncovers how spatial cognition maintains temporary conceptual prominence while establishing successive pathways for attention allocation. These directional pathways, visually represented by connecting arrows, illuminate the cognitive architecture underlying spatial processing, culminating in target (T) identification.

Matlock's (2010) theoretical framework regarding mental traversal of spatial configurations provides crucial insights into the cognitive mechanisms underlying spatial processing. The conceptualization of reference points as cognitive way stations suggests processing mechanisms through which speakers navigate complex spatial relationships. This theoretical framework demonstrates how spatial language emerges through selective activation of neural-cognitive mechanisms. The system operates by modulating specific spatial processing components - including boundary detection and feature extraction - while suppressing others. Through this selective engagement, linguistic expressions actively shape spatial cognition rather than merely mapping onto pre-existing spatial knowledge. This dynamic interplay between linguistic structure and cognitive processing reveals how speakers systematically conceptualize and communicate spatial relationships, suggesting spatial understanding is inherently mediated by language-specific patterns of neural activation.

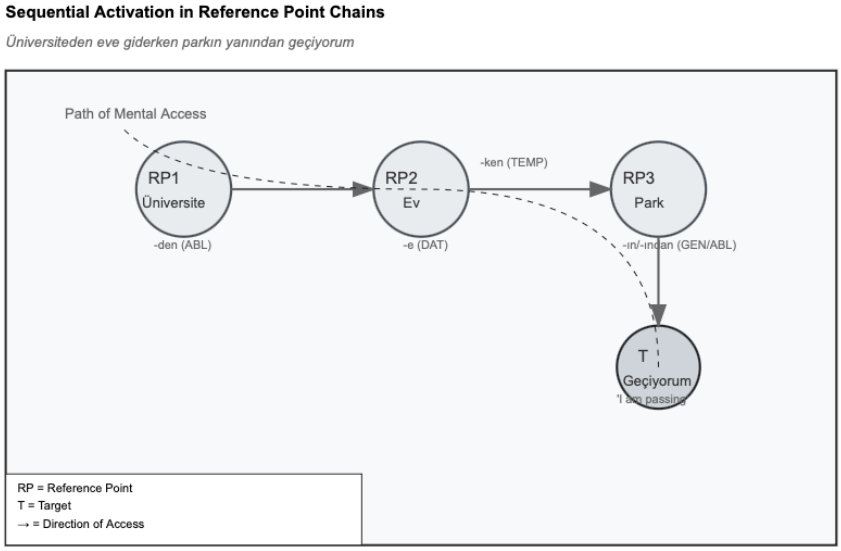


Figure 3. *Sequential activation in reference point chains: Progressive attention shift through reference points (RP1 > RP2 > RP3) to target (T), with arrows indicating paths of mental access*

The sequential nature of reference point activation, visually represented by the numbered progression in Figure 3, has significant implications for grammatical organization. Specifically, agglutinative systems can morphologically encode this movement through reference point chains, thus making the cognitive relationships that guide spatial understanding explicit. Furthermore, Slobin (2004) notes that languages systematically mark these spatial transitions through distinct grammatical mechanisms. By integrating search domains, scope predication, and reference point relationships, such theoretical framework yields comprehensive tools for analyzing spatial organization in language. Moreover, the interaction between these constructs indicates how spatial relationships are both cognitively structured and linguistically encoded through patterns of mental access and domain restriction. The analysis of scope relationships and cognitive activation patterns in reference point chains, as shown in Figures 1-3, provides a comprehensive framework for understanding the hierarchical organization and sequential processing of spatial relationships in nested locatives.

Figure 1 lays the foundation for the analysis by illustrating the fundamental components of spatial conceptualization: the immediate scope (IS), search domain (SD), and the relationship between the trajector (TR) and landmark (LM). This basic schema is a building block for more complex spatial configurations, such as those found in nested locatives. By establishing the core

elements of spatial reference, Figure 1 sets the stage for exploring how these components interact and combine to create hierarchically structured spatial expressions.

Building upon this foundation, Figure 2 demonstrates how the basic spatial schema from Figure 1 can be extended to represent the hierarchical organization of search domains in nested locatives. The layered structure of SD1, SD2, and SD3 in Figure 2 corresponds to the progressive spatial restriction that characterizes nested locative constructions. Each successive search domain establishes a more constrained referential space within the previous domain, reflecting the linguistic structure of nested locatives, where each locative expression further specifies the location of the target within the preceding spatial context.

Figure 3 complements the hierarchical representation in Figure 2 by visualizing the sequential activation of reference points in nested locatives. The progression from RP1 (üniversite) through RP2 (ev) to RP3 (park) demonstrates how the agglutinative morphology (-den, -e, -ın/-ından) explicitly encodes the cognitive relationships that guide spatial understanding. This sequential processing mirrors the mental traversal of hierarchically organized spatial relationships, with each reference point serving as a waypoint in the cognitive journey from the broadest spatial domain to the most specific location of the target. The path of mental access (shown by the dashed line) illustrates how search domains and scope predication interact, as each morphologically marked reference point establishes a more constrained referential space. The interaction between these constructs shows how spatial relationships are both cognitively structured and linguistically encoded through patterns of mental access and domain restriction. Just as Figure 2 shows the nested organization of search domains, the reference points in Figure 3 demonstrate how these spatial domains are sequentially activated and morphologically marked in language use.

Taken together, Figures 1-3 provide a unified framework for analyzing the cognitive and linguistic aspects of nested locatives. The integration of scope predication, search domains, and reference point relationships, as represented in these visualizations, offers a comprehensive approach to understanding how language structures and encodes complex spatial configurations. By grounding the analysis in the basic spatial schema of Figure 1 and then extending it to the hierarchical and sequential representations in Figures 2 and 3, the framework captures the essential cognitive processes and linguistic structures that underlie the conceptualization and expression of nested locatives.

This theoretical architecture demonstrates how linguistic systems encode spatial relationships through progressive cognitive domain restriction, from the maximal search domain to the precise trajector location. The permeability between domains reveals sophisticated mechanisms for managing complex spatial relationships, transcending simple containment hierarchies to establish

dynamic networks of spatial reference. The interaction between static configuration and dynamic access, coupled with hierarchical domain restriction, interprets fundamental principles of cognitive organization. The documented maintenance of distinct domain boundaries while preserving coherent reference across embedded spaces demonstrates how linguistic systems construct meaningful spatial relationships through structured patterns of cognitive domain manipulation. Therefore, this architecture reveals how cognitive systems manage multiple levels of spatial reference through systematic patterns of domain restriction and reference point chaining, advancing the understanding of coherent relationships across embedded domains.

3 Analysis

3.1 Basic Search Domain Construction

The analysis of basic search domain construction in Turkish reveals systematic patterns in how morphological marking establishes and delimits spatial relationships. Through examination of progressively complex constructions, we can observe how Turkish morphology explicitly encodes the theoretical components established in our framework: search domains, reference points, and scope relationships.

Consider these examples:

(1) Kitap masa-da
book table-LOC
'The book is on the table'

(2) Masa-da-ki kitap
table-LOC-REL book
'The book on the table'

(3) Kitap masa-nın üst-ün-de
book table-GEN top-POSS-LOC
'The book is on top of the table'

Example (1) demonstrates the foundational mechanism of search domain establishment in Turkish. The locative suffix -da creates a direct spatial relationship between the trajector (kitap) and landmark (masa). This basic configuration profiles a search domain that encompasses the functional region associated with the landmark, allowing for contextually appropriate interpretation of the spatial relationship.

Example (2) reveals a crucial advancement in spatial reference through the addition of the relativizer -ki. This morphological extension transforms the locative-marked nominal into an attributive modifier, demonstrating how Turkish grammar systematically builds complexity. The relativizer creates a bridge between basic spatial reference and high-level configurations by enabling spatial relationships to function as modifiers.

Example (3) exemplifies conceptual layering in spatial organization. Each morphological element corresponds to a distinct level of spatial conceptualization: the genitive marking on masa establishes the primary landmark, while the possessed relational noun üst introduces an abstract search domain that segments the landmark's spatial region. This interaction of morphological elements enables the construction of precise spatial reference while maintaining clear cognitive organization.

The system's capacity for encoding complex spatial relationships becomes evident in nested constructions:

(4) masa-nın üst-ün-de-ki kitap-lar-ın yan-ın-da
table-GEN top-POSS-LOC-REL book-PL-GEN side-POSS-LOC
'Beside the books that are on top of the table'

(5) oda-nın iç-in-de-ki dolap-ın üst-ün-de-ki kutu-nun alt-ın-da
room-GEN in-POSS-LOC-REL closet-GEN top-POSS-LOC-REL box-GEN bottom-POSS-LOC
'Under the box that is on top of the closet that is inside the room'

Example (4) demonstrates how Turkish morphology manages multiple spatial relationships through systematic reference point chaining. The first segment (masa-nın üst-ün-de-ki) establishes an initial spatial configuration, with the genitive-marked masa serving as the primary landmark. The relational noun üst, combined with possessive and locative marking, creates a precise search domain. The relativizer -ki then transforms this entire configuration into a reference point for the second spatial relationship, where kitap-lar serves as a secondary landmark with its own search domain defined by yan. This construction exemplifies what Langacker (2020) terms "flexible assembly," where the spatial configuration can be conceptualized either hierarchically (through embedding) or serially (through sequential processing).

Example (5) reveals the full complexity of Turkish spatial grammar through multiple levels of embedding. The construction creates a chain of spatial references, each building upon the previous one: from room (oda) to closet (dolap) to box (kutu). The scope predication pattern shows how each domain serves as both a container for subsequent reference and a link in the sequential chain. Thus, each link demonstrates the same structural principles seen in simpler

constructions, but their combination creates a precisely specified path through space. The sequence of relational nouns (iç ‘inside’, üst ‘top’, alt ‘bottom’) establishes distinct search domains, while the recurring -ki relativizer maintains cohesive connections between these domains. This organization reflects both the hierarchical nesting of spatial domains and the serial processing path through which speakers access these relationships.

3.2 Complex Nested Construction

The complex nested constructions in Turkish show higher-level patterns of domain embedding and hierarchical organization. Particularly, these patterns demonstrate intermixture of hierarchy and seriality in spatial reference. Consider examples (6) and (7), which show how Turkish morphology manages multiple processing windows while maintaining clear cognitive access paths.

(6) kitap [oda-nın iç-in-de-ki] [masa-nın üst-ün-de-ki] dosya-nın alt-ın-da
book room-GEN in-POSS-LOC-REL table-GEN top-POSS-LOC-REL file-GEN under-POSS-LOC
‘The book under the file that is on the table that is in the room’

(7) [bahçe-de-ki] [ev-in ön-ün-de-ki] [ağaç-ın alt-ın-da-ki] bank-ta
garden-LOC-REL house-GEN front-POSS-LOC-REL tree-GEN under-POSS-LOC-REL bench-LOC
‘On the bench that is under the tree that is in front of the house that is in the garden’

In example (6), each bracketed segment establishes a discrete processing window that serves both hierarchical and serial functions. The sequence [oda-nın iç-in-de-ki] > [masa-nın üst-ün-de-ki] > [dosya-nın alt-ın-da] exhibits both “zooming in” through hierarchical embedding and serial progression through spatial domains.

Example (7) extends this pattern to show how Turkish grammar organizes flexible assemblies in spatial reference. The progression from bahçe ‘garden’ through ev ‘house’ and ağaç ‘tree’ to bank ‘bench’ creates a systematic chain of processing windows, each maintaining its own profile-base organization while contributing to the overall spatial configuration.

The analysis of Example (8) reveals the fullest expression of the systematic organization of nested locatives:

(8) [kampüs-te-ki [fakülte bina-sın-da-ki [kat-ın son-un-da-ki [köşe oda-da-ki]]]] dolap

campus-LOC-REL faculty building-POSS-LOC-REL floor-GEN end-POSS-LOC-REL corner room-LOC-REL cabinet
'The cabinet in the corner room at the end of the floor in the faculty building on campus'

This construction shows multiple levels of "layering," where each domain acts as both a processing window and foundation for further spatial specification. The hierarchy moves from kampüs (setting the maximal scope) through increasingly restricted search domains (building > floor > room), each keeping its profile-base organization while adding to the overall spatial configuration. The reference point construction shows how each level anchors the next, creating "hierarchical chaining." The morphological marking makes this hierarchy clear: kampüs-te-ki marks the primary reference domain, bina-sın-da-ki sets the secondary level, kat-ın son-un-da-ki creates a tertiary reference point, and oda-da-ki marks the final spatial domain. The relativizer -ki works as a domain-bridging device, allowing smooth transitions between processing windows while maintaining access to the complete spatial configuration. This hierarchical organization shows the way Turkish grammar allows systematic building of complex spatial relationships through recursive embedding while keeping clear cognitive access paths through morphological transparency. Likewise, the construction shows how spatial cognition works with grammatical structure to create precise and clear nested locative expressions, displaying the link between grammatical form and conceptual organization.

3.3 Multiple Domain Integration

The multiple domain integration in Turkish nested locatives showcase the mechanisms through which complex spatial conceptualizations are processed cognitively and encoded linguistically. This construction type reveals intricate patterns of conceptual mapping and structural dynamics in the grammaticalization of spatial relationships. Consider this maximally complex exemplar of nested spatial configuration:

(9) [[ana bina-nın arka taraf-ın-da-ki] [bahçe-nin sol köşe-sin-de-ki]]
main building-GEN back side-POSS-LOC-REL garden-GEN left corner-POSS-LOC-REL
[[çınar ağac-ın-ın alt-ın-da-ki] [mermer masa-nın üst-ün-de-ki]] kitap
plane tree-GEN under-POSS-LOC-REL marble table-GEN top-POSS-LOC-REL book

‘the book on top of the marble table under the plane tree in the left corner of the garden at the back of the main building’

Example (9) demonstrates the systematic integration of multiple conceptual domains through elaborate morphosyntactic mechanisms. The structural architecture, marked by double bracketing, broadcast Turkish grammar as it mediates between conceptual complexity and linguistic expression through parallel processing mechanisms:

The initial bracketed configuration [[ana bina-nın arka taraf-ın-da-ki] [bahçe-nin sol köşe-sin-de-ki]] establishes a macro-spatial framework through progressive domain restriction. This sequence establishes the way reference point construction facilitates conceptual mapping from broader to more specific spatial domains. The primary reference point (ana bina) anchors the spatial configuration, while subsequent elements (arka taraf > bahçe > sol köşe) create increasingly restricted conceptual domains through organized morphological marking.

The secondary bracketed structure [[çınar ağac-ın-ın alt-ın-da-ki] [mermer masa-nın üst-ün-de-ki]] exemplifies the dynamic construal of immediate spatial relationships. This configuration shows how multiple reference points can operate within shared conceptual space while maintaining distinct cognitive accessibility. The morphological system creates explicit conceptual paths between reference points while preserving their individual contributions to the overall spatial representation.

(10) [[üst kat-ta-ki] [koridor-un sağ taraf-ın-da-ki]]
upper floor-LOC-REL hallway-GEN right side-POSS-LOC-REL
[[cam bölme-nin ön-ün-de-ki] [yeni dolap-lar-ın yan-ın-da]] duran çiçek
glass partition-GEN front-POSS-LOC-REL new cabinet-PL-GEN side-POSS-LOC standing flower
‘the flower standing beside the new cabinets in front of the glass partition on the right side of the hallway on the upper floor’

This construction affirms mechanisms for managing three-dimensional conceptual space through the precise integration of vertical and horizontal reference frames. The vertical dimension, instantiated through üst kat ‘upper floor’, establishes the primary conceptual domain that anchors subsequent spatial relationships. The horizontal plane undergoes systematic elaboration through a precisely ordered sequence of spatial specifications: the initial orientation established by koridor-un sağ taraf ‘right side of the hallway’ provides the foundational reference frame, which is further refined through cam bölme-nin ön

'front of the glass partition' and ultimately specified by dolap-lar-ın yan 'beside the cabinets'.

The morphological architecture creates coordinated cognitive access paths through this complex configurational network while maintaining conceptual accessibility to each reference point in the established hierarchy. The relativizer -ki functions as a crucial domain-bridging mechanism, facilitating conceptual transitions between spatial domains while preserving their interconnected relationships within the broader spatial framework. Each genitive-possessive construction (koridor-un taraf-ı, bölme-nin ön-ü, dolap-lar-ın yan-ı) establishes precise conceptual relationships between reference objects, contributing to the construction of a coherent spatial representation through morphological encoding.

The integration of vertical and horizontal specifications exemplifies how Turkish grammar systematically structures the complexity of three-dimensional spatial conceptualization through rigid morphological marking. This system enables speakers to construct and comprehend intricate spatial configurations while maintaining clear cognitive access paths through the established referential network. The orderly nature of this morphological encoding exposes fundamental principles about the relationship between grammatical structure and spatial conceptualization in human cognition.

4 Theoretical Implications

The analysis of Turkish nested locatives reveals fundamental mechanisms through which morphological systems encode complex spatial conceptualizations. Turkish morphology manifests intricate patterns of overt marking through an elaborate system of case marking, relativization, and possession—a structural configuration that stands in marked contrast to languages that predominantly rely on linear ordering and pragmatic interpretation for spatial reference construction. This systematic morphological encoding manifests in both static configurational paradigms and dynamic conceptualization processes. Consider the systematic encoding of conceptual paths.

(11a) kitap [oda-da [masa-da [kutu-da]]]
book room-LOC table-LOC box-LOC
'the book in the box on the table in the room' (zooming in)

(11b) kitap [kutu-da [masa-da [oda-da]]]
book box-LOC table-LOC room-LOC
'the book in the room on the table in the box' (zooming out)

These constructions exemplify how morphological architecture functions as an interface between conceptual complexity and linguistic manifestation. The systematic patterning instantiates bidirectional conceptual access pathways—either progressive restriction of search domains ("zooming in") or gradual expansion of spatial reference ("zooming out")—while maintaining structural coherence through explicit morphological instantiation.

The reference point construction architecture delineates how morphological marking orchestrates cognitive processing through complex spatial configurations. Through systematic morphological chaining, each reference point manifests explicit structural encoding via case and relativization mechanisms:

(12) [[büyük bina-nın iç-in-de-ki] [üst kat-ta-ki] [köşe oda-da-ki]] dolap
large building-GEN in-POSS-LOC-REL upper floor-LOC-REL corner room-LOC-REL cabinet
'the cabinet in the corner room on the upper floor inside the large building'

This construction demonstrates the mechanisms by which the morphological system facilitates incremental domain building through systematic reference point chaining. Each morphological element contributes to the construction of a sophisticated spatial representation while maintaining clear cognitive access paths through the established referential network. The alignment of prosodic and morphological structure indicates the means through which Turkish grammar manages complex spatial relationships while preserving processing efficiency. The prosodic organization in example (13) illustrates the systematic processing windows that Turkish morphology creates in alignment with conceptual structure:

(13) kitap / ana bina-nın giriş-in-de-ki / sol koridor-un baş-ın-da-ki / oda-da
book main building-GEN entrance-POSS-LOC-REL left hallway-GEN start-POSS-LOC-REL room-LOC
'the book in the room at the start of the left hallway at the entrance of the main building'

In contrast to English's prepositional stacking and implicit spatial domain relationships, Turkish manifests explicit morphological marking mechanisms. The system instantiates the locative -DA, relativizer -ki, and genitive-possessive marking to establish distinct cognitive pathways. This systematic morphological transparency exemplifies the direct encoding of conceptual operations:

(14) [fakülte-de-ki [kütüphane-nin iç-in-de-ki [okuma salon-un-da-ki [pencere kenar-ın-da]]]]
faculty-LOC-REL library-GEN in-POSS-LOC-REL reading room-POSS-LOC-REL window side-POSS-LOC
'by the window in the reading room inside the library in the faculty'

The system's flexibility in managing spatial relationships appears in how speakers can reorganize the same spatial configuration while maintaining grammatical coherence through morphological marking:

(15a) [masa-nın üst-ün-de-ki] [kitap-lar-ın yan-ın-da] duran kalem
table-GEN top-POSS-LOC-REL books-GEN side-POSS-LOC standing pen
'the pen standing beside the books on the table'
(15b) [Kalem] [[masa-nın üzer-in-de dur-an] kitap-lar-ın] yan-ın-da
pen table-GEN top-POSS-LOC stand-PART book-PL-GEN side-POSS-LOC
'The pen is beside the books standing on top of the table'

Despite a slight alternation in meaning, both sentences (15a) and (15b) encode an identical spatial configuration. The minor difference lies in the emphasis placed on the different spatial relationships within the scene. Sentence (15a) primarily highlights the location of the pen relative to the books, with the books' position on the table serving as secondary information. In contrast, sentence (15b) places a more balanced emphasis on the spatial relationships between the pen, books, and table, giving relatively equal prominence to the books' location on the table and the pen's position relative to the books.

These constructions delineate how Turkish morphology facilitates dynamic conceptual access while maintaining structural integrity. Rather than relying on pragmatic inference or linear ordering, the system instantiates explicit morphological encoding of the cognitive operations inherent in spatial conceptualization. This systematic marking mitigates processing complexity through the establishment of distinct pathways within nested spatial domains. The near-identical spatial configurations encoded by sentences (15a) and (15b), despite their slight difference in meaning, further underscore the capacity of Turkish morphology to express complex spatial relationships through explicit structural means. This parallelism illuminates fundamental principles regarding the interface between grammatical structure and conceptual organization.

Therefore, the Turkish morphological system instantiates spatial reference operations through systematic grammatical manifestation. Whereas other languages predominantly relegate inter-domain spatial relationships to pragmatic interpretation, Turkish morphology outlines these conceptual connections

through explicit structural encoding. This morphological transparency elucidates the interface between spatial cognition and grammatical architecture—patterns that remain obscured in languages with less overt marking systems.

The implications of explicit marking extend beyond spatial reference to fundamental questions regarding the mechanisms through which languages encode cognitive relationships via grammatical architecture. In Turkish, morphological manifestation directly corresponds to cognitive operations in spatial processing, revealing patterns that remain latent in languages with less overt marking systems. Specifically, each morphological component instantiates a distinct cognitive operation: genitive marking establishes reference points that anchor spatial configurations, relational nouns delineate search domains that constrain conceptual space, locative case demarcates specific regions within these domains, and the relativizer facilitates recursive embedding of spatial relationships.

These systematic patterns contribute to our theoretical understanding of how grammatical systems interface with spatial cognition, thereby illuminating fundamental principles regarding the correlation between morphological architecture and spatial conceptualization. Through explicit morphological instantiation, multiple organizational principles—iconic, hierarchical, serial, and discursive—converge to achieve sophisticated spatial reference while maintaining cognitive accessibility. Consequently, Turkish nested locatives exemplify the systematic interface between grammatical architecture and spatial cognition across linguistic systems.

4.1 Cross-linguistic Significance

The systematic juxtaposition of Turkish nested locatives and English spatial constructions reveals fundamental distinctions in the mechanisms through which languages encode complex spatial relationships. As Levinson (2003) establishes, languages implement diverse strategies for encoding spatial relationships while potentially instantiating universal cognitive principles. Through systematic morphological manifestation, the Turkish system delineates how grammatical architectures can render transparent the cognitive operations inherent in spatial reference.

Talmy's (2000) analysis of concept structuring systems establishes crucial theoretical underpinnings for these cross-linguistic patterns. The juxtaposition of English sequential prepositional phrases and Turkish integrated domain structuring through agglutinative morphology exemplifies fundamental principles on how grammatical architectures mediate conceptual complexity and linguistic manifestation. As Göksel and Kerslake (2011) establish, these distinct grammatical configurations achieve parallel communicative functions through markedly different structural mechanisms, instantiating the interface between

grammatical form and conceptual organization. Moreover, the architectural distinctions between these systems indicate comprehensive patterns in spatial grammar, particularly in how languages orchestrate hierarchical organization with linear sequencing.

Slobin's (2004) comparative framework delineates the divergent mechanisms through which languages encode spatial relationships while potentially instantiating shared cognitive foundations. Turkish manifests explicit hierarchical organization via morphological binding patterns and obligatory possessive-genitive constructions; conversely, English predominantly relies on sequential arrangement of spatial elements. This architectural distinction shapes fundamental aspects of speakers' conceptualization and processing of spatial relationships.

Kita & Özyürek (2003) comparative framework delineates how distinct grammatical systems shape spatial conceptualization and expression. Turkish morphology instantiates explicit paths through spatial configurations, diverging from languages that rely more heavily on pragmatic interpretation. Levinson et al.'s (2003) cross-linguistic analysis elucidates how different languages encode spatial relationships through distinct grammatical architectures. This finding validates Haun et al.'s (2011) demonstration of how spatial language and cognition covary across cultures, pointing to fundamental patterns in how grammatical systems orchestrate spatial complexity while maintaining cognitive accessibility. As Moore (2014) posits, these typological variations in spatial grammar manifest both language-specific structural solutions and shared cognitive foundations.

Furthermore, Atak (2018) conducted a comprehensive investigation into Turkish spatial language from a localization perspective, examining how native speakers encode spatial relations morphologically in figure-ground configurations. The study revealed that speakers systematically alternate between intrinsic and relative frames of reference, with frame selection being contingent upon object properties and spatial configurations. Building directly on these initial findings, Atak and Uzun (2019) expanded this analysis through four distinct production tasks, confirming and refining the understanding of frame selection patterns. Their results demonstrated that while both frames are utilized, the relative frame predominates when figures lack salient directional cues, whereas the intrinsic frame becomes more prominent with clear internal orientations. The combined research acknowledges how Turkish speakers navigate spatial relationships through explicit grammatical marking, with frame selection being influenced by figure-ground characteristics, landmark orientation, and scene presentation. These investigations collectively reveal the sophisticated interplay between Turkish morphological structure and spatial cognition, advancing the understanding of how grammatical encoding mediates spatial representations.

Complementing these findings, Ertekin (2021) demonstrates that the lexical diversity in Turkish spatial expressions is closely linked to distinct visual attention patterns during the processing of static spatial scenes. This eye-tracking study indicates that a richer array of spatial terms—particularly those marked by explicit locative case markers—elicits longer and more frequent fixations on critical regions of the stimuli, underscoring the cognitive load imposed by detailed morphological encoding of spatial relations. This insight is highly relevant to the study of nested locatives, where multiple spatial relationships are embedded within a single construction. The complex layering of locative markers in nested locative constructions likely parallels the increased visual attention observed by Ertekin, suggesting that the explicit grammatical marking in Turkish not only clarifies spatial relations but also demands intricate cognitive processing. Ertekin's (2021) findings provide complementary evidence for the notion that the systematic morphological encoding of spatial relationships in Turkish—whether in simple or nested configurations—mediates spatial cognition.

5 Conclusion

The examination of Turkish nested locatives delineates coherent patterns in how morphological systems encode complex spatial relationships. Within Langacker's (2008) Cognitive Grammar framework, Turkish instantiates explicit marking through case suffixes, relativization, and possession to establish hierarchical spatial references. These patterns elucidate key principles of search domain construction, scope predication, and reference point relationships, pointing to broader manifestations of spatial reference in language. Morphological transparency instantiates a direct correspondence with cognitive operations in spatial conceptualization. Through explicit encoding of conceptual relationships, the Turkish system validates Langacker's model of how grammar orchestrates multiple search domains. The morphological architecture in Turkish additionally manifests both static configuration and dynamic access patterns in spatial reference.

Turkish nested locatives instantiate the interaction between hierarchical and serial organization that Langacker establishes as central to spatial reference. The system maintains multiple processing windows while facilitating both microcosmic and macrocosmic analysis through consistent grammatical mechanisms. Göksel and Kerslake's (2011) examination of Turkish morphosyntax advances our theoretical understanding of how grammatical systems orchestrate spatial complexity. Morphological systems can delineate explicitly the cognitive operations involved in establishing and maintaining spatial reference through structured encoding of search domains, reference points, and scope relationships. The Turkish data elucidates how grammatical

architectures encode these spatial relationships through precise morphological manifestation.

Several trajectories emerge for future cross-linguistic research. Studies could examine patterns of domain restriction and elaboration in other agglutinating languages, particularly investigating how morphological explicitness corresponds to spatial cognition. Research might also delineate how different grammatical systems orchestrate hierarchical and serial organization in encoding complex spatial relationships. The examination of Turkish morphology elucidates how grammatical systems instantiate key cognitive operations in spatial reference: establishing search domains, constructing reference point chains, and managing scope relationships. These patterns demonstrate how languages employ distinct structural mechanisms to achieve parallel communicative goals while maintaining cognitive accessibility. Cross-linguistic comparisons of such systems can further illuminate the interface between grammatical structure and spatial cognition. Processing windows and flexible assemblies in Turkish nested locatives materialize through the intricate interaction between prosodic and morphological structure. The system establishes manageable processing units while preserving access to both local and global spatial relationships. This organization points to the essential correspondence between grammatical structure and cognitive processing in spatial reference.

Turkish nested locatives exemplify systematic relationships between form and meaning, integrate static and dynamic conceptualization, and employ multiple organizational principles. The analysis elucidates how languages orchestrate complex spatial relationships through grammar while maintaining cognitive accessibility. Future cross-linguistic research could examine how different languages instantiate spatial reference through distinct grammatical mechanisms. Comparing how languages encode spatial relationships—through morphology, syntax, or other means—can indicate universal patterns while documenting diverse structural solutions. Such studies could delineate the correspondence between grammatical form and conceptual organization across different language types. Moreover, incorporating empirically derived sample sentences in future investigations would further ground theoretical claims in authentic linguistic usage. By systematically analyzing naturalistic data alongside experimental tasks, researchers can enhance the robustness of their findings and provide a clearer picture of how grammatical structures interact with conceptual organization in spatial language.

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