

## ARTICLE

# On the Emergence of the Paradigm of Cause Markers from Prepositions in English: A Grammaticalization Perspective

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## ABSTRACT

This study traces the grammaticalization processes that lead to the paradigm of cause-encoding prepositions. The objectives of this paper are (i) to trace the emergence of cause from the prepositions *by*, *at*, *with*, and *about*; (ii) to examine the mechanisms and principles in their grammaticalization processes; and (iii) to account for their unidirectional semantic changes. Using the synchrony-for-diachrony approach within grammaticalization theory and historical data from various sources, this study investigates the developmental trajectories of prepositions from their original meanings to causality. Grammaticalization theory allows for the investigation of phenomena observed in diachronic developments of cause-encoding prepositions, including mechanisms for semantic change and grammaticalization principles. This paper argues that context-induced reinterpretations and subjectification are the key driving forces in the grammaticalization processes of these prepositions. This suggests the development involves a gradual conceptual transfer within the same domain grounded in conversational inferences. The grammaticalization path of cause markers demonstrates the emergence of a new paradigm through gradual metonymic processes and analogy due to their semantic and functional similarity. The prepositions take on a new function as cause markers within the domain of correlation, influenced by pragmatic inference, which results in the parallel development of these prepositions. Considering that all their source lexemes are related to spatial proximity, the development of cause markers from prepositions may be attributable to their origins.

**Keywords:** Synchrony-for-Diachrony Approach; Causality; Context-Induced Reinterpretation; Metonymic-Metaphorical Model; Subjectification; Unidirectionality

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# 1. Introduction

Causality is a concept that has many facets and internal complexity <sup>[1]</sup>. Dirven (1995, p. 95) states that two internal situations could explain causality: the situation (S1) that triggers another situation (S2), including change of states, processes, events, and activities, where S1 is the cause of S2 and S2 is the result of S1 <sup>[1]</sup>. Many cognitive linguists have studied the concept of cause expressed by prepositions in English. Dirven (1997) investigates twelve prepositions that express cause, categorizing them into three sets, including proximity (*at, with, by*), source (*of, from, out of*), and volume (*in, about, over*) <sup>[2]</sup>. Kim (2018) examines prepositions frequently used with emotive adjectives, including *by, at, with, about, for, and of*, in adjectival constructions that encode causality <sup>[3]</sup>. Osmond (1997, p. 112) discusses how eight prepositions, namely, *by, with, at, about, of, to, for, and over*, are used to mark cause in constructions of *X is adj./past participle \_\_\_ Y*, (e.g., Mary was angered *by* his behavior) <sup>[4]</sup>. Among these prepositions, *by, with, at, about, and over* describe causality, which links two events together - the operation of an emotional trigger with a causal force and the experience of emotions. However, the other prepositions, *of, to, and for* convey projected emotion that indicates long-term attitudes rather than emotional reactions in Bolinger's (1984) classification <sup>[5]</sup>. Dirven (1995, pp. 95–96) also distinguishes between emotions with causes and without causes by providing the following two examples, "John is angry at Mary" and "John is in love with Mary." In the first sentence, the nominal Mary triggered a situation, which resulted in John experiencing the emotion of anger, whereas in the second sentence, Mary is the object of John's emotion rather than the trigger of another situation <sup>[1]</sup>. Therefore, this present study focuses on only four prepositions, *by, at, with, and about*, that describe causality. The preposition *over*, which is less frequently used to encode cause, was also excluded. These prepositions are considered within broader contexts, not limited to adjectival constructions.

Prepositions have received attention from historical linguists as well as cognitive linguists. Among them, Iglesias-Rábade (2011) investigates twelve Middle English prepositions, *aboue, after, at, bi, bifore, bihinde, beside, in, on, ouer, purgh* and *under* that express location and direc-

tion <sup>[6]</sup>. He focuses on their semantic erosion, using historical data from the Helsinki Corpus of English Texts (1991) and the Middle English Dictionary. Lundskær-Nielsen (1993) examines aspects of the semantics and syntax of prepositions *in, on, and at* in Old and Middle English from 900 to 1400, using texts from the Anglo-Saxon Chronicle for Old English and from *Ancrene Wisse, Vices and Virtues*, and Chaucer's *A Treatise on the Astrolabe* for Middle English <sup>[7]</sup>.

These studies provided a better understanding of the uses of prepositions in historical data and Present-Day English (PDE) but have limitations. Research in cognitive and historical linguistics has used synchronic perspectives to examine the uses of English prepositions in current and historical times. The studies in historical linguistics have not addressed the function of cause markers in prepositions and have not touched on the dynamic development process of prepositions nor analyzed interactions such as emergence, loss, and renewal. Therefore, this research aims to address this gap. This present study examines *by, at, with, and about* that express causality from a grammaticalization perspective. It explores the emergence of cause from these prepositions and examines the mechanisms and grammaticalization principles involved in this process. Additionally, it examines the unidirectional semantic changes that occur through context-induced reinterpretation, metonymic-metaphorical models, <sup>[8]</sup> and subjectification <sup>[9]</sup>.

## 2. Theoretical Background

### 2.1. Space Grammar

In space grammar, spatial relations involve participants with different degrees of focal prominence: the locatum and a reference object <sup>[10]</sup>. In Langacker's framework, the locatum is the primary focal participant, representing the located entity referred to as the trajector (TR) and positioned with respect to a secondary focal participant known as the landmark (LM) <sup>[10]</sup>. This study explains the spatial origins of the prepositions based on the spatial relations between these two participants, the TR and LM. Spatial meanings inherently involve profiling a spatial configurational relationship between these participants, which is fundamental to the semantic structure of grammatical items, including prepositions.

Grammaticalization theory holds that the source meanings preserve their schematic structures, thereby constraining the development of new grammatical functions<sup>[9]</sup>. Thus, this study first examines the original spatial proto-scenes of the prepositions, analyzing their configurational relationships. It then traces how these spatial origins of the prepositions are grammaticalized into causal meanings while preserving their spatial configurations. Finally, it analyzes how cause-encoding prepositions interact within a single functional domain.

## 2.2. Synchrony-for-Diachrony Methodological Paradigm

To investigate the developmental paths of causality-encoding prepositions, this study employed the “synchrony-for-diachrony methodological paradigm”<sup>[11]</sup>, which highlights conceptual contiguity based on human cognition and perception<sup>[12]</sup>. Within this framework, language changes are influenced by the cognitive process and communicative goals of interlocutors, and these factors trigger the process of grammaticalization<sup>[13]</sup>.

To provide a conceptual reconstruction of cause-encoding prepositions, this study utilizes historical data from the Oxford English Dictionary (henceforth *OED*, online version), Bosworth-Toller Anglo-Saxon Dictionary, Dictionary of Old English, and Middle English Compendium<sup>[14–17]</sup>. However, this study does not adopt a quantitative approach, focusing on attested forms and functions of prepositions to reconstruct the conceptual changes using function-oriented approach. These resources are used to track their earliest attestations in historical data and to support unidirectional grammatical paths of prepositions driven by context-induced reinterpretation and the metonymic-metaphorical model<sup>[8]</sup>. Metaphor and metonymy are key aspects of semantic changes, facilitating semantic changes based on conceptual contiguity and “blended spaces” that involve conceptual structures applied to both sources and targets<sup>[18]</sup>.

Combining these two theoretical frameworks, this study identifies the initial spatial relationships that provide the semantic basis for cause markers and traces the grammaticalization paths from these spatial sources to

the cause meanings. This shows how schematic structures constrained their development while enabling semantic changes and a consistent interaction of these prepositions within a functional domain.

## 2.3. Intracategorical Grammaticalization and Subjectification

Subjectification has been considered a subtype of grammaticalization<sup>[19]</sup>. However, subjectification is a distinct pragmatic-semantic process whereby meanings based on external situations are increasingly changed into meanings based on internal situations due to speakers’ involvement in semantic changes<sup>[2,20–21]</sup>. It serves as a mechanism for semantic changes rather than being a part of grammaticalization.

Traugott (2010) discusses subjectification at two different stages of grammaticalization, namely, primary grammaticalization from lexical to grammatical items and secondary grammaticalization from less grammatical to more grammatical items<sup>[22]</sup>. According to her, subjectification is more likely to occur in primary grammaticalization due to prior strengthening of pragmatic inferences before semanticization and reanalysis. The emergence of cause markers from prepositions is an example of secondary grammaticalization. However, subjectification is predominantly observed in the emergence of causal meanings from prepositions, where they acquired more subjective and speaker-based meanings of causal markers through pragmatic enrichment, serving their grammatical functions as prepositions.

There is some debate as to whether subjectification should be considered a subtype of grammaticalization, particularly in the process of intracategorical grammaticalization. However, it is generally agreed that grammaticalization should be involved in the development of (more) grammatical meanings. The grammatical status of prepositions can vary on a grammaticality continuum within the functional domain of prepositions. Hence, when semantic changes occur along this continuum from less grammatical to more grammatical, following the unidirectionality hypothesis, those leading to increased grammaticality are considered an instance of grammaticalization.

### 3. Cause-Encoding Prepositions in Historical Data

#### 3.1. Old English (OE, ca. 450–1150)

##### 3.1.1. Source Meanings

Prepositions that convey causality originated from Old English (OE) and were primarily used with spatial meanings. The primary spatial meaning of *at* is a coincidence between two entities and is represented as a spatial point. *At* describes a simple spatial relation of co-location, where the TR and the LM meet or intersect at a point, as conceptualized as a “coincidence”<sup>[23]</sup>.

As for *by*, two points are used to indicate the adjacent relation between two entities. According to the OED, the source meaning of *by* indicates the referent point to the spatial position, which is near or adjacent to. This preposition developed an overarching meaning of ‘near to, not quite reaching’<sup>[14]</sup>.

*About* suggests circumferential relations. The OE form of *about* was *on-būtan*, which means ‘about, by the outside of.’ This form stems from *ymbūtan* ‘about, around, without,’ which was a compound form of *ym* ‘in, on’ + *be* ‘alongside, surround’ + *ūtan* ‘on the outside’ (OED)<sup>[14]</sup>. The unaccented prefix *on* of *on-būtan* reduced to *a-* as shown in (1d) by a phonological reduction in the late 10th century.

Initially, *with* was used to indicate opposition. *With* originated from Germanic *\*wider-*, which had two primary meanings: ‘in opposition to’ and ‘motion in proximity’ (‘near’, ‘close to’, ‘against’, and ‘alongside’) in OE (OED)<sup>[14]</sup>. However, its usage of opposition is now limited to specific collocations. Their source meanings and usages are provided below.

- (1) a. *at* ‘point in space’ (OE Genesis 2428)

*Æt burhgate beorn gemitton sylfne sittan.*

At-PREP city.gate-DAT man-PL-NOM meet-PST himself-REFL-ACC sit-IN

‘at the city gates, (they) met the man himself sitting.’

- b. *by* ‘near,’ ‘adjacent to’ (898 *Anglo-Saxon Chron*)

On Defna scire *be* þære norþ sæ.

On Defna-GEN shire-DAT by the north sea-DAT

‘In the shire of the Defns by the North Sea.’

- c. *with* ‘opposition’ (c950 *Lindisf. Gosp.* Mark)

Sætt se hælend *wið* ðæs dores

Sat-SG-past the savior-SG-NOM with this-DEM door-SG-DAT

‘The Savior sat opposite to this door.’

- d. *about* ‘around’ (OE Bosworth-Toller Anglo-Saxon Dictionary)

Ðú tæcst Israhela folce *abūtan* ðone munt

You-SG-NOM teach-PRES of Israel-GEN people-ACC around the mountain-DAT

‘You teach the people of Israel around the mountain.’

In OE, these prepositions had different meanings related to space. Over time, these meanings evolved into multiple extended senses across different categories, but they are still rooted in their initial spatial meanings.

##### 3.1.2. Direction and Motion

*At* indicates that two entities are co-located and coincide with each other. Although the context in which *at* is used has semantic features of proximity, it does not strictly indicate proximity<sup>[23]</sup>. However, the prepositions *by* (OE-PDE), *with* (OE-19c), and *about* (OE-PDE) have been in use since OE to indicate spatial proximity and vicinity: *by* ‘in the vicinity of, near, close to, beside’; *with* ‘near, close to, against, alongside’; and *about* ‘in the vicinity, nearby, various places nearby.’ All four prepositions, including *at*, derived the meanings from spatial meanings to direction and motion. The senses of ‘direction’ and ‘motion’ conveyed by these prepositions are illustrated in the following examples (2) and (3).

*At* expressed various spatial positions in the historical data, conveying meanings similar to *through*, *from*, or *of*, *to*, and *toward*, as illustrated in example (2). The meanings referred to as direction and motion in OE describe a static point, which can be conceptualized as (i) a position which the TR moves toward or reaches by completed action or motion (‘to’ or ‘toward’: OE-1602) as in (2a); (ii) a position which the TR departs from or has left as a result of the motion (‘from’ or ‘of’: OE-1884) as in (2b); or (iii) the static position where the TR is in the process of movement from a departure point to an arrival point (‘through’: OE-PDE) as in (2c). In other words, the various senses indicate a spatial

point. These meanings are provided in example (2).

- (2) a. Ge ne comon *æt* me.  
 You-PL-NOM not-NEG come-PST to me-DAT  
 ‘You did not come to me’ (OE, c1000 West Saxon Gospels: Matthew (Corpus Christi Cambridge MS.) xxv. 43)
- b. Leorniað *æt* me.  
 Learn-IMP from me-SG-DAT  
 ‘Learn from me.’ (OE, c1000 West Saxon Gospels: Matthew (Corpus Christi Cambridge MS.) xi. 2)
- c. Eodon *æt* óðrum durum.  
 Go-PL-PST through other door-PL-DAT  
 ‘They went through the other doors.’ (OE, a1000, Batt. Fin. (Gr.) 16)

In contrast to *at*, which has a spatial concept of co-location, the other prepositions, *by*, *with*, and *about*, have the spatial meaning of proximity. In the schema of spatial proximity, the TR (entity) and LM (location) face each other or are in an adjacent relation, where the TR is directed toward the LM. Likewise, the LM is oppositely directed toward the TR. In this spatial situation, when the close distance between the TR and LM is focused, these prepositions begin to serve the meaning of spatial proximity, such as ‘near’ and ‘close to,’ without showing any directions. When the TR moves along the path to arrive at the LM, the path that the TR traces is the focus of the schema, and the concepts of spatial direction ‘towards’ and ‘along’ are derived as in the example (3). Both meanings indicate movement and direction from the original place in which the TR initially was to the LM, but they are different depending on whether the goal is a point-like LM (‘towards’) as in (3a) and (3c) or a horizontal surface LM (‘along’) as in (3b). However, in the case of *about* in OE, the TR surrounds or is on the outside of the plane, the LM<sup>[3]</sup>. It is important to note that the spatial meaning derives meanings of direction and motion related to orbital motion as in (3d), such as ‘around the outside of’ and directional senses of ‘around’ and ‘cross or over in various directions.’ This shows the persistence of the source meaning of ‘round’ in the newly derived senses.

- (3) a. Caucasus se beorg is *be* norþan  
 Caucasus the mountain-NOM is-3SG-PRES  
 toward north-DAT

‘The Caucasus Mountain is in (toward) the north.’

(OE translation of Orosius, History i.i. §7 Citation details for translation of Orosius, History)

- b. 3if ic þe læde *be* þam wege.  
 If-COND I-NOM you-ACC lead-SG-PRES  
 along the way-SG-DAT  
 ‘If I lead you along the way.’ (971, Ælfred, translation of Boethius, De Consolatione Philosophiae xl. §5)
- c. Ða se hálga wer ne com, ðá  
 When-CONJ the holy-adj man-NOM not  
 come-PAST then-ADV  
 comon hí eft *wið* his  
 come-PST they-PL-NOM again-ADV toward  
 him-DAT  
 ‘When the holy man did not come, then they came again towards him.’ (Bosworth-toller Anglo-Saxon Dictionary)
- d. com Swegen cyning *mid* his flotan  
 come-past Swein king-SG-NOM with his-  
 POSS feet-PL-DAT  
 to Sandwic & wende þa swiðe raðe *abutan*  
 to Sandwich-DAT and go-PST then very-ADV  
 quickly-ADV around Eastenglum into Humber  
 muþan.  
 East Englas-PL-DAT into Humber estuary-  
 DAT  
 ‘(King Swein) came with his fleet to Sandwich and then went very quickly around East Anglia into the Humber estuary.’ (OE *Anglo-Saxon Chron.* Tiber. B.i)

The grammaticalization from space to direction and from direction to motion has historically been a one-way path. These metonymic expansions are based on teleological contiguity, where all these meanings are interconnected in how humans perceive and interpret the world around them<sup>[24]</sup>.

### 3.1.3. Relation (Circumstance, Condition, and Means)

The source meanings of prepositions were extended to various senses in different categories beyond spatial domain. This sub-section will explore how these preposi-



tions were used in the relation domain in OE. This study discussed earlier that the primary spatial meaning of *at* is a coincidence between a TR and an LM. From a cognitive perspective, the contact between the TR and LM can be considered a relation between them. Generally, a linguistic construct that locates an entity at a particular point in space indicates a close relationship between the entity and the location, as in example (4).

(4) Connection with a Space (OE-PDE)

a. Higelác Hreþling, þær æt hám wunað.

Higelac, Hreðel-NOM there-ADV æt home-LOC dwell-3SG-PRES

‘Higelac, son of Hreðel, dwells there at home.’ (OE Beowulf 1923)

b. I was twice *at* Court before, the same week.

‘I was at Court two times earlier in the same week.’

(1754 C’tess Shaftesbury in Priv. Lett. Ld. Malmesbury I. 81).

*At* expresses both a simple location and a connection with the place. In (4a), *at home* suggests that he resides at home and is engaged in activities associated with his home rather than indicating *Higelac*’s mere presence at home. This nuance is more apparent in a sentence (4b), where *at court* indicates the speaker was involved in legal dealings or activities related to the function of the court. The meaning of ‘practical connection’ in (4) is established when the function of the LM is more focused than the spatial relation where the TR and LM intersect. When the TR is animate in the scene between the TR and LM, it is assumed that the TR can perform a task/activity or carry out typical duties associated with the location at the LM. Further, what the TR nominal does is related to the practical function of the LM; for example, *residents at home carry out typical domestic duties associated with a residence*, *teachers or students at school* primarily engage in teaching and learning, and *priests at church* perform church-related tasks. This use can be illustrated in the following pragmatic inference.

(5) Pragmatic inference

School is the place to teach students.

John is at school.

He is there to serve the purpose of the school.

He works there.

He is a teacher at that school.

When animate entities are at a place, it is assumed that they work to serve the usual purpose of the place, and this use is a conversational implicature of the sentence used with *at* <sup>[23]</sup>. In contrast to other prepositions, *at* expresses a general spatial relation, where the TR is within the area. This spatial configuration of the TR within the LM area seems to enable the meaning of practical connection to emerge based on pragmatic inference. The way in which the animate TR is located within a particular LM area allows for the inference of its involvement in activities related to the purpose of that place. This creates the conditions for the meaning of practical connection to be conversationally implicated.

The other three prepositions, which expressed spatial proximity and vicinity, *by*, *with*, and *about*, also underwent semantic change to various senses in the relation domain in OE. Concepts such as space, direction, and motion, which are physical and concrete, become sources of semantic change for more relational and abstract concepts, such as circumstance, condition, and means. Among the three prepositions, *with* underwent the semantic change from the meaning of ‘opposition’ (source meaning) to its antonymous meaning of ‘association’ in OE, as illustrated in (6).

(6) a. [Opposition]

Sætt se hælend wið ðæs dores

Sit-PST the savior-NOM with the door-DAT

‘The Savior sat opposite to the door.’ (c950 *Lindisf. Gosp.* Mark)

b. [Association]

Þæt hie healfre geweald wið Eotena

That they-NOM half-SG-GEN control-SG-ACC with Jutes-PL-GEN

bearn agan moston.

offspring-PL-ACC possess-INF must-3PL-PST

‘they (the Danes) would share half of control with the sons of the Jutes.’ (OE Beowulf 1088)

As discussed, when the TR faces the LM, the meanings of ‘direction’ and ‘motion’ are derived. In the schema of spatial proximity, reciprocity relationships arise based on force dynamics when the TR is directed toward the LM and the LM is in the opposite direction of the TR. These reciprocity relations form a foundation for the abrupt semantic extension from ‘opposition’ to ‘association,’ al-

lowing *with* to undertake various functions in the relation domain <sup>[25]</sup>. The reciprocity feature in this image schema with a focus on force dynamics makes the TR and LM associated with each other, giving rise to the sense of ‘association.’ In other words, among the components of the image schema, including the TR, the LM, the path, and flows of forces from the TR and the LM, the force-dynamics of the TR and LM are profiled from a microscopic focus by Rhee (2002a), thus developing the seemingly contrasting concept of association <sup>[26]</sup>.

After the emergence of association, this meaning branches out to other related concepts with shared characteristics, such as companion, attendant circumstance, instrument, means, agent, and cause. Among these concepts, companionship is a semantically basic and concrete notion (i.e., Kim 2022; Dirven 1997) that describes the proximal situation wherein X is with Y <sup>[4,25]</sup>. This proximal situation has led to similar grammaticalization paths of cause-encoding prepositions.

The preposition *by* underwent a semantic change from spatial vicinity to functional vicinity; therefore, it acquired functions related to the concepts of circumstance, condition, means, instrument, agent, and cause based on the sense of ‘connection’, which represents an intermediate stage in its development <sup>[27]</sup>. When two entities are located close to each other, it indicates that they are functionally close <sup>[8]</sup>. This demonstrates the connection between two entities in the space domain, mapping the connection between two events in the relation and correlation domains. The meanings of *with* and *by* in the relation domain are illustrated in (7) and (8).

(7) a. [Companion]

his here geseah þæt he *mid* þy horse afeoll  
his-POSS army-NOM saw-PST that he-NOM  
with the horse-DAT fell off-PST  
‘His army saw that he fell off with his horse’  
(OE, The Old English Orosius edited by Janet Bately. 64/30)

b. [Means/Instrument]

ealle cweðan ægðer ge *mid* muðe ge *mid* mode  
all say-INF either or with mouth-INSTR or  
with mood-INSTR  
‘they all should say either in word or in heart.’  
(OE, AEIfric’s catholic homilies.1979. 10/270)

(8) a. [Companion]

Wif þ bið *be* ánum were  
Woman-NOM that is-3SG-PRES by one-ADJ  
man-3SG-DAT  
‘A woman who is with one man’ (ii. 158, 5,  
Bosworth-Toller Anglo-Saxon Dictionary)

b. [Instrument/Means]

Ic *be* songe ecgan sceolde.  
I-1SG-NOM by song-SG-INSTR say-INF  
should-AUX  
‘I should say by means of a song.’ (OE, *a1000  
Scopes Widsið*)

c. [Circumstance/Condition]

Me lihtede candles to æten *bi*.  
Me-SG-DAT light-PL-PST candles-PL-NOM  
to eat-INF by  
‘Candles were lit for me to eat by.’ (OE, 1154  
*Anglo-Saxon Chron*)

In the case of *about*, its original meaning refers to the state where the TR surrounds the LM, describing the situation whereby the TR is within reach of the LM. The spatial relation between the TR and LM led to the development of more abstract concepts in the relation domain. In this domain, the relationship between two entities originates from the original schematic structure where the TR orbits and rotates around the LM. In OE, this preposition was used to indicate companionship and connection (with topics), as shown in (9).

(9) a. [Companion]

Ða gesawon þa ðe him *abutan*  
Then-ADV see-PST those-PL-NOM who him-  
3SG-DAT about  
wæron þæt þær towerd wæs.  
were-PL-PST that-CONJ there-ADV toward  
was-3SG-PST  
‘Then those who were around him saw that  
(something) was approaching there.’  
(OE, West Saxon Gospels: Luke (Corpus  
Christi Cambridge MS.) xxii. 49)

b. [Connection ‘concerning’]

ealre hohfolnesse gymene do *abutan* þa agil-  
tendan broðra.  
All-SG-GEN anxiety-SG-GEN care-SG-ACC  
do-IMP about the guilty-adj brother-PL-ACC

‘Do all care of anxiety concerning the guilty brothers.’ (OE, Rule St. Benet (Tiberius MS.) (1888) xxvii. 57)

In contrast to other cause-encoding prepositions, *about* was not used to mean ‘concerning’ in (9). In the development of the meaning of concerning, the original schematic structure of spherical proximity and orbital relationship to the LM is preserved, metaphorically depicting the subject as orbiting around and relating to the other main topic.

The three prepositions that express spatial proximity – *by*, *with*, and *about* – have more grammatical functions in the relation domain, such as companion, instrument, medium/means, and circumstance/condition, as shown in examples (7) to (9). However, they still preserve their schematic structures of spatial proximity, indicating that one entity is close to another and both are in the same space. In the context of companionship, two entities still have a similar spatial relation where they are near each other. However, this relation does not simply denote physical proximity; rather, it implies that these entities travel together or spend time in each other’s company. In examples (7b) and (8a), these prepositions indicate instrument or means, where an animate entity utilizes an inanimate object to accomplish a certain purpose. Although instruments and means are conceptually similar, the concept of means is less tangible and more abstract than that of instruments. Circumstance/condition describes more dynamic situations between two entities beyond a static spatial relation, in which the condition directly affects the action of one entity and becomes essential to it.

These diachronic changes are driven by semantic mechanisms and contextual conditions. In the concept of companionship, the shift from individuals to objects changes the original meaning of ‘companion’ to ‘instrument,’ showing how contextual conditions motivate semantic changes.

### 3.2. Middle English (ME, ca. 1150–1500)

#### 3.2.1. Source Meanings Direction and Motion

As discussed, in OE, *at* expresses both a simple location and a connection with the place. Similarly, when used with certain objects that are centers of activities,

these phrases represent the activities themselves (e.g., *at work* ‘working’). When *at* collocates with instruments, this usage is extended to the use of instruments. Both functions involve a close association between the action and the objects that enable the action. Its uses of conditioning circumstance and instrument are first attested in the early 14th century data, as shown in example (10). *At* takes on the function of the instrument later, compared to other prepositions.

#### (10) a. [Conditioning circumstance]

*At al perils wil y go.*

At all-ADJ peril-PL-DAT will-AUX I-SG-NOM go-INF

Lit. ‘At all perils will I go.’ ‘I will go in the face of all dangers or risks.’ (c1380 Sir Ferumbras (1879) l. 3485)

#### b. [Instrument]

*We may see þis at eye*

We-NOM-PL may-AUX see-INF this-ACC-SG at eye-SG-DAT

Lit. ‘We may see this at the eye.’ ‘We may perceive this with the eye.’ (c1375, English Wycliffite Sermons xxxvi, in Selected Works (1869))

A significant semantic change of *about* in ME is the emergence of the approximation meaning. *About* originally meant spatial proximity in OE but came to represent approximation as demonstrated in (11), meaning ‘almost resembling’ or ‘near correctness.’

#### (11) many oþer manere colours *aboute* white,

Many-ADJ other-ADJ kind-GEN-SG colors-PL-ACC about white-SG-ACC

as watry colour and mylky colour.

as-CONJ watery-ADJ color-SG-ACC and-CONJ milky-ADJ color-SG-ACC

‘many other kinds of colors around white, such as watery color and milky color.’

(a1398 J. Trevisa tr. Bartholomaeus Anglicus De proprietatibus Rerum)

In contrast to proximity in space and time in OE, the function of approximation denotes closeness in qualities of states and numbers. It often appears with adjectives, numbers, and measures, indicating ‘how close to the truth.’ This preposition began being used to indicate probability,



frequently collocating with superlative adjectives in late modern English in 1827 (e.g., “The first two are about the nicest girls in all.” (1880 H. Smart Social Sinners I. ix. 182)). The shift in meaning from ‘proximity’ to ‘approximation’ and ‘approximation’ to ‘probability’ involves an expansion of semantic scope. The concept of probability is used in broader contexts than proximity and approximation because it has a more general, vague, and less definite interpretation, collocating with linguistic items that describe the qualities of states, processes, and events. It indicates that this preposition has relinquished its specific meaning and gained a more generalized sense of ‘in the vicinity of,’ driven by generalization<sup>[28]</sup>. The new general meaning, which has lost the specific details and complexities of the original meanings, becomes the schematic meaning.

### 3.2.2. Correlation: Mutuality, Agent, Causality

In the correlation domain, the relationship between two entities is closer and stronger than those in the relational domain. The relationship between them is interdependent, where the presence, absence, or state of one entity affects the other. When compared to circumstances, conditions, and means in the domain of relation, agents, and causality inherently involve mutual interaction based on the interplay between two entities, resulting in mutual influence.

The first use of *at* to mark mutual relations was attested at the beginning of the early 14th century. *At* is used to describe mutual relations and states between two entities, for example, a state of being in accord in (12a). The earliest attested use of this preposition to introduce a cause or event leading to a described result dates back to around 1300. Later, in the late 14th century, *at* began to be used to indicate the cause of emotion.

- (12) a. [Mutual Relation]  
 We ben *at* on acord.  
 We-PL-NOM are-PRES at one-ADJ accord-DAT  
 ‘We are at one accord’ (c1325, Cœur de L. 1369)
- b. [Cause]  
 He starf *at* the furste tidynge.  
 He-SG-NOM die-PST at the first-ADJ tiding-DAT

‘He died upon hearing the first news’ (c1300, Kyng Alisaunder 4637)

c. [Cause of emotion]

Thei maken ioye and gladnesse *at* hire dyenge.  
 They-PL-NOM make-PRES joy-SG-ACC and gladness-SG-ACC at her-POSS dying-DAT  
 ‘They make joy and gladness at her dying.’ (1366 Mandeville’s Trav. xxviii. 287)

The function of the agent marker from *by* and *with* began in late Middle English (ME). These prepositions introduce the principal agent in passive constructions. The first recorded use of *by* as the agent marker is from the very beginning of the 15th century, and that of *with* is from the beginning of the 14th century. The first uses of these two prepositions as cause markers were also attested in the 15th century. Their uses of the agent and cause markers are illustrated in (13) and (14).

- (13) a. That Cytee was destroyed *by* hem of Grece.  
 That-DEM city-SG-NOM was-PST destroyed-PTCP by them-ACC of Greece-SG-GEN  
 ‘That city was destroyed by them from Greece.’ (c1400 Mandeville’s Trav)
- b. Soone after *by* this synne he fylle.  
 Soon-ADV after-ADV by this-DEM sin-SG-DAT he-NOM fall-PST  
 ‘Soon after, because of this sin, he fell.’ (1484 Caxton tr. G. de la Tour-Landry Bk. Knight of Tower (1971) lxxxviii. 120)
- (14) a. He was *with* þe prestes shriue.  
 He-SG-NOM was-SG-PST with the priest-PL-DAT shriven-PTCP  
 ‘He was shriven with (by) the priest.’ (c1300, Havelok (Laud MS.)
- b. And deyde *wyþ* strokis þat þey hente.  
 And died-PST with stroke-PL-DAT that-REL they-PL-NOM receive-PST  
 ‘And died from the strokes that they received’ (?a1400, Arthur 466)

The agent is closely related to the instrument and means, as these three concepts are involved in causing changes in states, actions, or performance. However, in contrast to the instrument and means, the noun phrases col-

locating with *by* and *with* represent animate entities with intention or purpose in the concept of the agent. Heine and Kuteva (2002, 79) present evidence supporting that the concept of the agent originated from the comitative, using examples such as Swahili *na* ‘with’ and French *avec* ‘with’<sup>[29]</sup>. While it seems that the development of *by* and *with* involves intermediate stages, such as instrument and means, it suggests that the entities involved in the companion relation are viewed based on their actional status, where an agent with intention brings about specific changes. Both *by* and *with* have parallel grammaticalization paths until late ME, but *by* becomes specialized in encoding the agent, while *with* is used to mark the companion function in PDE. In OE, *about* was used to mark the companion but did not further develop to indicate the agent in passive constructions.

Examples (13b) and (14b) illustrate the use of a cause marker from these prepositions *by* and *with*, which can be traced back to the 15th century. It appears that the cause marker evolved from the agent marker. The cause bringing about the effect based on temporal relation is more abstract and less physical than the agent, where volitional persons or animals saliently change or disrupt the existing state.

In OE, *fram/from*, *purh*, *mid*, and *of* were frequently used to indicate the agent (OED)<sup>[14]</sup>. During the ME period, language users had several more choices for expressing the agent using prepositions, including *with* and *by*. However, *of* remained a prevalent choice until the 16th century<sup>[30]</sup>. Although *by* was not frequently used as an agent marker in passive constructions before the 15th century, it was often used with another preposition, *of*, within Shakespeare’s plays in Early Modern English (EModE). Therefore, *by* fully undertook the function of the agent in passive constructions, establishing itself as the primary preposition for this function in PDE. This indicates that these old prepositions, such as *fram/from*, *purh*, *mid*, and *of*, in the functional domain of the agent competed with the new form *by* and consequently underwent a process of specialization<sup>[28]</sup>.

### 3.3. Early Modern English (EModE, ca. 1500–1700):

#### Correlation: Mutuality, Agent, Causality

As previously discussed, originally, *about* refers to

the spatial relation where one entity surrounds another. Over time, this spatial relation evolved into a more abstract concept of causality based on the interaction between two entities. This dynamic interaction in the spatial domain eventually led to the conceptualization of *about* as a cause marker, reflecting that the relationship between the two entities in a spatial context is metaphorically extended to express causality.

(15) He is very courageous mad **about** his throwing into the water.

‘He is very courageously mad about his throwing into the water.’

(a1616 Shakespeare *Merry Wives of Windsor*)

The first use of *about* as a cause marker was first noted in 1600, later than the other three prepositions, which began to be used as cause markers in the 15th century. While the other three prepositions were already functioning as cause markers in this functional domain in the 15th century, *about* joined this paradigm only in the 17th century.

## 4. Discussion

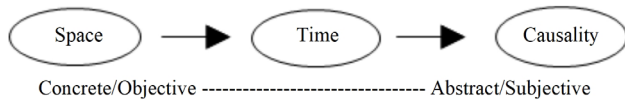
### 4.1. Category-Internal Grammaticalization and Unidirectionality

Grammaticalization occurring on a continuum with bipolar categories applies to semantic changes within the category of prepositions. Since there is fluidity within the category of prepositions<sup>[31]</sup>, different members in this class of prepositions are given varying grammatical statuses on the continuum of grammaticality. Therefore, intracategorical grammaticalization falls within the scope of grammaticalization. The metaphorical shift indicates the conceptual transfer from concrete domains on the left side to abstract domains on the right side in (16).

In **Figure 1**, the semantic extension of cause-encoding prepositions demonstrates abstraction and the unidirectionality principle from concrete to abstract concepts. Space is a concrete concept described externally, indicating physical locations. On the other hand, time is more abstract, as temporal markers rely on human perception and cognition to represent a sequence of events or to position events within a timeline. Logical relations, such as causality, are included in the domain of quality located at the far

right end of the continuum in (16). Causality is most abstract because it is inferred based on a speaker's judgment regarding the situation.

(16) PERSON > OBJECT > SPACE > TIME > QUALITY<sup>[32]</sup>



**Figure 1.** Semantic extension of cause-encoding prepositions.

Although the semantic change of prepositions does not involve decategorialization, it still falls within the scope of grammaticalization, based on unidirectionality from concrete to abstract meanings and fluidity in intracategorical status. Expanding the scope of grammaticalization research contributes to linguistic theory by motivating the emergence of encodings, such as causality<sup>[33]</sup>.

## 4.2. Syntactic (and Semantic) Evolution of Prepositions as Cause Markers

As discussed in section 4.1., the semantic change of cause-encoding prepositions can be considered as intracategorical grammaticalization. The initial use of prepositions as cause markers was predominantly attested in ME. The uses of these prepositions as cause markers have evolved from ME through EModE to PDE, undergoing syntactic and semantic changes, such as an increase in syntactic bonding and a decrease in compositionality. Example (17) demonstrates this.

(17) Cause markers in ME, early ModE, and PDE

- a. He starf *at* the furste tidynge.  
He-NOM die-PST at the first-adj news-DAT  
'He died upon hearing the first news.' (c1300, Kyng Alisaunder 4637)
- b. Soone after *by* this synne he fylle.  
Soon-ADV after-ADV by this-det-SG sin-SG-ACC he-pro-NOM fell-PST  
'Soon after, because of this sin, he fell.' (1484 Caxton tr. G. de la Tour-Landry Bk. Knight of Tower (1971) lxxxviii. 120)
- c. *By* the growth of his beard and gray hair, I did not know him.  
'Because of his long beard and gray hair, I

did not recognize him.' (1667 S. Pepys *Diary*)

d. *At* my request, this war was vndertake.

'At my request, this war was undertaken.'  
(1600 E. Fairfax tr. Tasso *Godfrey of Bulloigne*)

e. You would be amazed *by* the size of the crowd at your funeral.

(2019 Fiction, Michigan Quarterly Review, COCA)

f. This morning, I find myself outraged *at* the situation you find yourself in, and at the state of my country.

(2012 FIC: Analog Science Fiction & Fact, COCA)

<https://www.english-corpora.org/coca/>, last accessed in June 2024)<sup>[34]</sup>

In the earlier uses of prepositions as cause markers in ME, they introduced an adjunct in (17a) and a disjunct in (17b), providing a reason or cause of the action. In EModE, these prepositional phrases continued to function as adjuncts or disjuncts, often being fronted to the beginning of the finite clauses, as shown in (17c) and (17d). These adjuncts and disjuncts, which provide additional information such as causes and reasons, are semantically transparent and flexible in syntactic structure and can be omitted without affecting grammaticality. In PDE, however, when these prepositions are used in adjectival constructions, they typically introduce complements, as in (17e) and (17f). They are more fixed in syntactic structures, tied to the adjectives, and less transparent in meanings.

The different structures across these periods indicate that more complex structures became reduced and tightened to the head, ultimately forming a 'strong syntactic bond' during the process of grammaticalization<sup>[35]</sup>. This is characterized by the decrease in compositionality suggested by Traugott and Trousdale (2013)<sup>[36]</sup>. As illustrated in example (17), the prepositional phrases that function as complements become more idiomatic and less transparent compared to those functioning as adjuncts or disjuncts. This means their compositionality decreases as the combination of an adjective and a preposition (e.g., be surprised at) becomes conventionalized rather than representing the combined literal meanings of individual words<sup>[36]</sup>. Therefore, the cause markers in (17e) and (17f) can be considered more grammaticalized than those in (17a) to

(17d) in terms of syntactic and semantic features along the continuum of grammaticality.

### 4.3. Conceptual Metaphor and Metonymy

Two metaphors, SPACE IS TIME and TIME IS CAUSE, are evident in the semantic extension of cause-encoding prepositions. Example (18) demonstrates the semantic change of *at* from spatial to temporal meaning.

(18) Semantic change from spatial to temporal meaning (SPACE IS TIME)

- a. He set *at* his owne table.  
He-SG-NOM sat-PST at his-POSS own-adj table-SG-ACC  
'He sat at his own table.' (c1300 *K. Alis*. 4175)
- b. When we were ..... *at* the marriage of your daughter. (a1616 Shakespeare *Tempest* 1623)
- c. Mr. Whirler..will be at home precisely *at* two. (1758 Johnson *Idler* 19 Aug. 153)

The preposition *at* in example (18a) indicates a spatial point, 'the table' where he sat, whereas in (18c), it indicates the time point, which is '2 o'clock'. This preposition can have spatial and temporal meanings by introducing nominals that indicate time and space, for example, 'table' and '2 o'clock.' *At* is used for the time expression in (18c) based on the metaphorical conceptualization of TIME in terms of SPACE. In example (18b), 'the marriage of your daughter' can convey both spatial and temporal meanings, meaning 'at the place where they married' or 'at the time when they married,' showing that *at* can simultaneously encode both spatial and temporal points when accompanied by following nominals that indicate an occurrence or event. This example demonstrates that semantic change is not abrupt but gradual, showing the intermediate stages of semantic extension from spatial to temporal meaning.

The concept of CAUSE is also conceptualized in terms of TIME. Understanding causality is more abstract and subjective because it is inferred based on a speaker's subjective beliefs and judgments regarding situations. Therefore, the speaker's subjectivity is reinforced in each discourse context. Example (19) illustrates the metaphorical semantic change from TIME to CAUSE and the gradual change in meaning between these two domains. The examples in (19) are from the Corpus of Contemporary American English (COCA) <sup>[34]</sup>.

(19) Semantic change from time to causality (TIME IS CAUSE)

- a. People should feel free to email me *at* 2 AM or check my Twitter feed timestamp. (Blog: danpink.com)
- b. I'll curl up here, by the door, like a watchdog, ..., setting out deep containers *at* the first drop of rain, going without water so that there will be plenty for our jacaranda. (Fiction: Women language)
- c. They would scream *at* the sight of a gun, don't you see? (Website: National Park Service)
- d. They would faint *at* the first drop of blood. (Website: National Park Service)
- e. Bessie Merryman and my girlfriends sent them *at* my request. (Fiction: Wallis's War)  
<https://www.english-corpora.org/coca/>,  
last accessed in June 2023 <sup>[34]</sup>

The preposition *at* encodes time with temporal nominals as in (19a), but this temporal relation can also be expressed with the time indicated by activities or events in (19b), 'the first drop of rain,' indicating the person sets out the deep containers almost simultaneously with the first drop of rain. In (19c), two events, their screaming and seeing a gun, happen simultaneously, where *at* can express both temporal relation and causality, indicating 'the sight of a gun' can be when their screaming happens and the cause that invokes it. In sentence (19d), 'the first drop of blood' could be interpreted as a cause for fainting, but it could also refer to the temporal point *at* which both events occur. In the conceptualization of cause, there are two events or activities that occur at the same time or at the proximate time. These two can relate to causality in that one event or activity preceding the other can provoke another. The preposition *at* in (19e) indicates the causality in that the request is a direct cause that made the subject send them. As shown in examples in (18) and (19), the semantic change from space to time and from time to causality is not abrupt but gradual and continuous, with multiple intermediate stages between the two domains involved.

The semantic extension of prepositions such as [Space > Time] and [Time > Cause] follows the unidirectionality from less grammatical to more grammatical and from con-

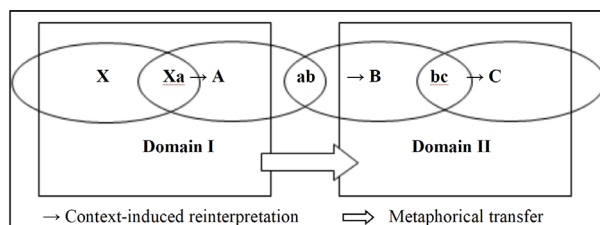


crete to abstract concepts. The conceptual metaphor from SPACE to TIME and from TIME to CAUSE is observed cross-linguistically. Traugott and König (1991, p. 197) provide the instances of this grammaticalization path from temporal markers ‘after,’ ‘when,’ ‘as long as,’ ‘since,’ to cause marker ‘because,’ ‘because of’ in Finnish, Estonian, Romanian, French, and Latin <sup>[21]</sup>.

The unidirectional path of grammaticalization from spatial to temporal markers and from temporal to cause markers is motivated by the conceptual metaphors SPACE IS TIME and TIME IS CAUSE. Also, the prepositions *at*, *by*, *with*, and *about* mark causal, spatial, and temporal concepts based on these two metaphors. In the conceptual system, metaphors create coherence and regularities between concepts. Language users can use the same preposition for multiple concepts with metaphorical correspondences, such as SPACE and TIME, as well as TIME and CAUSE. This indicates that the connection between form and meaning is not arbitrary but logical and motivated <sup>[37]</sup>.

#### 4.4. Metonymic-Metaphorical Model

As the semantic changes of cause-encoding prepositions involve metaphor and metonymy, the metonymic-metaphorical model presented in **Figure 2** effectively illustrates their functional-semantic extension.



**Figure 2.** The metonymic-metaphorical model <sup>[8]</sup>.

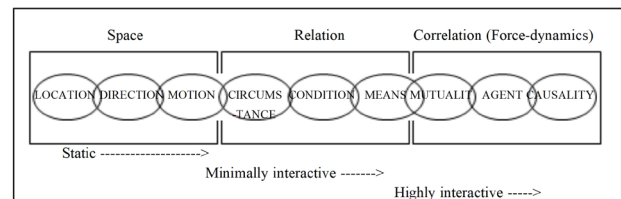
This model incorporates the contrasting mechanisms of metaphor at the macroscopic level and metonymy at the microscopic level. In the functional-semantic extension of cause-encoding prepositions, a series of metonymic changes at the microscopic level (transfer within the same domain from X (B) to Xa (bc) and from Xa (bc) to A (C)) leads to metaphorical changes at the macroscopic level (transfer from Domain I to II). For example, the semantic changes in the prepositions [Location > Direction > Motion], [Circumstance > Condition > Means], and [Mutuality > Agent > Causality] are realized as a metaphorical trans-

fer from the Space domain to the Relation domain, and the Relation domain to the Correlation domain.

Also, it has been observed that new meanings, as shown in *Xa*, *ab*, and *bc* in **Figure 2**, do not replace old meanings right after they emerge in the contexts, and instead, old and new meanings coexist for a long period, exhibiting overlap or heterosemy <sup>[36]</sup>. The overlap between old and new meanings is illustrated in the examples in section 4.3.

#### 4.5. Context-Induced Reinterpretations

Heine and Kuteva (2002, p. 2) argued that during the path of grammaticalization, “linguistic items lose in semantic, morphosyntactic, and phonetic substance” and simultaneously “gain in properties characteristic of their uses in a new context” <sup>[29]</sup>. Since specific contexts are required for linguistic items to be grammaticalized, grammaticalization is considered a product of context-induced reinterpretation <sup>[29]</sup>. The general semantic-functional change of cause-encoding prepositions can be explained using the metonymic-metaphorical models proposed by Heine et al. (1991a), as illustrated in **Figure 3** <sup>[8]</sup>. This representation suggests three functional domains: Space, Relation, and Correlation, which are examined from a macroscopic perspective, demonstrating domain transfers. The adjacent notions within these domains are discussed from a microscopic perspective based on context-induced reinterpretation, which is responsible for the inferential processes of meanings in new contexts.



**Figure 3.** Semantic-functional changes of causality encoding prepositions.

**Figure 3** schematically represents the semantic-functional changes of causality-encoding prepositions within three conceptual domains: Space, Relation, and Correlation (force-dynamics) domains. Each functional domain comprises three neighboring concepts: (a) Location, Direction, and Motion in the Space domain, (b) Circumstance, Condi-



tion, and Means in the Relation domain, and (c) Mutuality, Agent, and Causality in the Correlation domain.

In the domain of space, Location, Direction, and Motion are closely related based on teleological contiguity, wherein they are interconnected by the way humans perceive and interpret the world <sup>[24]</sup>. However, these three concepts can be distinguished from each other based on their level of staticity along a continuum: Location refers to the position of a particular point, while Motion involves the change of position over time in space, including non-static qualities such as distance, speed, and direction. Direction indicates both the static position in space toward which the object moves and the movement of the object to that position. Therefore, the concepts of space, direction, and motion are interconnected in the spatial domain to varying degrees.

In the Relation domain, the concepts of Circumstance, Condition, and Means are related based on spatial vicinity, but they differ in the degree to which they are closely related. Circumstance refers the environments surrounding someone or something, which may have some effect but are not necessary. In contrast, Condition necessarily assumes an impact on someone's behavior or thoughts, which means the relation between two entities is more interactive in Condition compared to Circumstance. Means represent relatively more interactive situations between two entities in that Means impose a stronger effect than Condition by being used to achieve specific goals. As prepositions progress through the semantic change of [Circumstance > Condition] and [Condition > Means], the association of the TR and LM becomes more robust and more interactive.

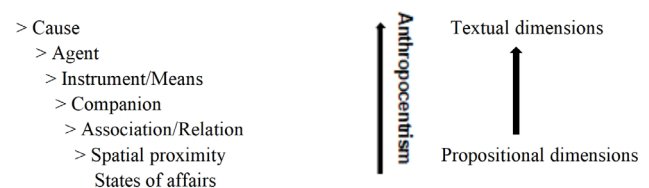
In the domain of Correlation, the concepts of Mutuality, Agent, and Causality are interconnected as they represent reciprocal and interactive elements between two forces and determine the outcome based on their relative strengths. These concepts are distinguished by the strength of the correlation between them. Mutuality describes the reciprocal state in which an entity is directed towards and received by another. Causality refers to the relationship between cause and effect, where the interaction between these two forces yields specific results for which the cause is accountable. A change in state is not necessarily entailed in the concept of Mutuality; however, Causality changes

the state of either of the two forces depending on which one is stronger. Therefore, the correlation between the two forces is weakest in Mutuality and strongest in Causality. The concept of Agent, positioned between Mutuality and Causality on this continuum, reflects a relatively more physical and tangible correlation. However, the categorization of functional domains may not create definitive distinctions between concepts because semantic changes are fluid and gradual. This shows that domains are flexible and fluid, providing convincing explanations for gradual metonymic changes. In sum, semantic-functional changes of causality encoding prepositions are gradual and context-driven and the domains across Space, Relation, and Correlation captures the meaning change driven by context-induced reinterpretation.

#### 4.6. Subjectification

Subjectification refers to pragmatic-semantic processes whereby meanings based on external situations are increasingly changed into meanings based on internal situations due to speakers' involvement in semantic changes, namely, speakers' subjective beliefs or attitudes toward situations <sup>[20,21]</sup>. As metonymy involves semantic changes based on contiguity, subjectification, which specifies one meaning in terms of another within the same domain, is considered a sub-type of metonymization <sup>[21]</sup>. The process of subjectification is evident in the development of cause-encoding prepositions.

Figure 4 shows the process of subjectification in semantic changes of *by*, *with*, and *about*. Their original spatial meanings have objective meanings based on external situations, but the meaning of cause based on internal situations is more subjective because it involves the speakers' subjective judgment regarding the situations <sup>[20]</sup>.



**Figure 4.** Pragmatic-semantic processes of cause-encoding prepositions.

The semantic changes observed in the paradigm of cause-encoding prepositions exhibit a close relationship

with anthropocentrism—the tendency to interpret and view situations from a human-centered perspective <sup>[26]</sup>. This explains the unidirectional semantic paths of these prepositions from objective to subjective and anthropocentric meanings over time.

The prepositions *by*, *with*, and *about* have undergone similar grammaticalization processes. In their early usages, these prepositions refer to spatial relations (lateral relations of *by*, oppositional relations of *with*, and circumferential relations of *about*), which indicate the physical proximity between two entities. However, in the process of grammaticalization, the original concrete meanings, such as the side-by-side alignment of *by*, the face-to-face alignment of *with*, and the orbital motion and rotation of *about*, have been gradually bleached, retaining only the spatial proximity between the two entities <sup>[25]</sup>. This process, known as desemanticization <sup>[28]</sup>, weakens the original concrete meanings and allows for reinterpretation in specific contexts, leading to the development of more abstract meanings. As a result, the prepositions evolved to represent the fundamental concept of ‘companion,’ describing a proximal situation where X is with Y. This suggests that an entity in a spatially proximal position with another is viewed as if it exists to accompany the other. This extension from spatial proximity to companionship reflects a human-centered view, as companionship generally involves human participants.

The prepositions, *by* and *with* encode instrument and agent. The semantic extension from ‘companion’ to ‘instrument’ and from ‘instrument’ to ‘agent’ exemplifies the process of subjectification involved in anthropocentrism. When two entities are in proximity, they are perceived as a human and an object. In this scenario, there is the potential for the person to use the object as an instrument from a human perspective since humans are uniquely distinguished from other species by their ability to use tools, which is considered an exclusive trait of humans <sup>[38]</sup>. The semantic change, whereby meaning shifts to an agentive meaning, occurs when the associated entities are observed in an actional status, indicating acting with volition and intentional awareness intention. In contrast to the instrument, which denotes a more objective means of facilitating actions, the concept of agent reflects anthropocentric and subjective characteristics of human cognition, such as volition, inten-

tion, and awareness. Later, the prepositions become specialized for different functions (e.g., agent and instrument functions for *by*; companion marker for *with*) due to the varying frequencies of their functions.

In the grammaticalization of cause marking prepositions, subjectification is an effective mechanism as speakers’ subjective and evaluative judgments are projected onto linguistic forms. This process, known as metonymization, involves drawing on world knowledge to highlight specific aspects of a chain of events <sup>[38]</sup>.

## 5. Conclusions

This study uses grammaticalization theory to analyze how these prepositions have changed semantically and functionally over time from their source lexemes to their current uses in PDE. The major issues discussed in this study are as follows: (a) diachronic semantic-functional development of causality-encoding prepositions, namely, *by*, *at*, *with*, and *about*, (b) the emergence of cause markers from these prepositions from a grammaticalization perspective, and (c) motivation for the grammaticalization of the paradigm of causality-encoding prepositions.

By examining historical attestations and semantic extension, the study found that the grammaticalization from spatial meaning to abstract causal meaning was not abrupt but involved a series of intermediate stages, such as condition, means, and agency that encode more abstract interactions between entities. It is also involved in the reanalysis of spatial configurations into relational and correlational (force-dynamic) meanings. Over time, spatial relationships between entities were reinterpreted to enable functional extension into the domain of causality.

This paper explains that their semantic changes were driven by two semantic mechanisms: metaphor and metonymy, as demonstrated in Heine et al.’s (1991a) metonymic-metaphorical models <sup>[8]</sup>. Metaphor involves a dramatic shift in categories, while metonymy is a gradual process based on conceptual contiguity <sup>[39]</sup>. This study argues that context-induced reinterpretations (Heine et al., 1991a) and subjectification (Traugott and Dasher, 2002; Traugott, 1989; Traugott and König, 1991) are the key driving forces in the grammaticalization processes of these prepositions <sup>[1,2,20,21]</sup>. This suggests that the development involves a gradual conceptual transfer within the same domain

grounded in conversational inferences.

The grammaticalization paths of these prepositions are not isolated but show parallelism through analogy due to their semantic and functional similarity. The prepositions take on a new function as cause markers within the domain of correlation, influenced by pragmatic inference, which results in the parallel development of these prepositions. Considering that all the source lexemes of prepositions are related to spatial proximity, the development of cause markers from prepositions may be attributable to their origins. This results in a paradigm of cause-encoding preposition in PDE.

The emergence of English cause markers adhere to the unidirectional hypothesis, which showed a unidirectional developmental path from concrete spatial meanings to more abstract causal meanings, but not the reverse. Future studies should examine this phenomenon cross-linguistically to explore whether parallel grammaticalization pathways from spatial sources to cause markers exist in other languages. Although English prepositions are used to encode causality, future studies also investigate whether this pattern is observed analogically in other languages that use postpositions and case markers for the same function. Such studies would contribute to a deeper understanding of how cause marker paradigms develop across different languages.

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## Conflicts of Interest

The authors declare no conflict of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript; or in the decision to publish the results.

## Abbreviations

Abbreviations	Full Form	Abbreviations	Full Form
ACC	accusative	INSTR	Instrument
ADJ	adjective	LOC	Locative
ADV	adverb	NEG	Negation
AUX	auxiliary	NOM	Nominative
COND	Conditional	PST	Past
CONJ	Conjunction	PTCP	Participle
DAT	Dative	PL	Plural
DEM	Demonstrative	POSS	Possessive
DET	Determinator	PREP	Preposition
FUT	Future	PRES	Present
GEN	Genitive	REFL	Reflexive
IMP	Imperative	SG	Singular
INF	Infinitive		

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