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Continua and orientations of packing-repacking and unpacking ideational metaphor for knowledge construction

Abstract: This article constructs the multidimensional paradigm to specify the continuum of ideational metaphor by virtue of metaphoricity. Metaphoricity is redefined as a relative term measured by the amount of grammatical metaphor and the rank-shift to delineate the continuum of metaphorization. As an expression is packed and repacked by ideational metaphor, its semantic density increases in implicitness. But its context-dependency declines since ideational metaphor smashes its iconic relation with the reality, which to a certain extent weakens semantic gravity. The orientation towards the nucleus can be instantiated to illustrate the direction of metaphorization. In contrast, as a metaphorical expression is unpacked, its semantic density decreases by releasing the inter-stratal tension between grammar and semantics. Its context-dependency strengthens by rebuilding its iconicity with the reality, which reinforces semantic gravity. An element with the lower nuclearity to Center may be unpacked at the initial stage. This article provides an academic lens for knowledge construction in English teaching and learning.

1 Introduction

Grammatical metaphor is a pivotal concept of reconstruing experience via the inter-stratal tension between lexicogrammar and semantics in Systemic-Functional Linguistics. It embodies a social value in producing discourses from a sociosemiotic perspective. Grammatical metaphor was initially coined as incongruency (the non-typical expressions) in anti-language (Halliday 1976). Later it was revised to an

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inter-stratal tension between grammar and discourse semantics (Martin 2018, 2020a) or a remapping relation between grammar and semantics (Halliday and Matthiessen 2004, 2014). It was argued that grammatical metaphor was closely related to the degree of iconicity of language which could unravel the relation between language and reality (Halliday and Matthiessen 2014; Martin and Matruglio 2020). Some scholars have taken lexicogrammar, semantics and context into account to expand the scope of grammatical metaphor (Hao 2020) by virtue of Sydney School's stratification (Martin and Rose 2007; Martin 2013). As a subtype of grammatical metaphor, ideational metaphor embodies the power of grammatical metaphor in reconstruing the experiential world. It is oriented towards ideational metafunction. Ideational metaphor reconstrues experience in the aspects of "complexity and rank" (Matthiessen 1995: 102) by means of downgrading "from clause nexus to clause, from clause to group/phrase, and even from group/phase to word" (Halliday and Matthiessen 2004: 646, 2014: 719). For example, the clause complex *she got married to him because she loved him* can be downgraded to the clause *she got married to him because of love*. In this ideational metaphor, there is a rankshift from a clause complex to a clause, in which "a clause complex is decomplexed… and treated as a simple clause" (Matthiessen 1995: 102).

As a powerful discursive strategy, ideational metaphor was used to distinguish spoken texts from written ones (Halliday 1989, 1993). Later other genre types were explored in terms of ideational metaphor to unravel how knowledge is constructed, for example, pedagogical discourses (Liardét 2016; Rose 2020), literature (Mu 2015; Yang 2018), journalism (Scott 2009), and translation (Alves et al. 2011; Steiner 2018). Ideational metaphor is considered to be "an essential resource in technical writing for organizing text as sequences of messages that predict and accumulate information as they go" (Rose 1997: 50), and has been deployed to explore knowledge construction in technical manuals (Lassen 2003), clinical studies (Galve 1998), and physics and aeronautic engineering (Dong et al. 2020). These studies deepen our understanding of ideational metaphor as a powerful semogenic or meaning-making resource.

This article focuses on ideational metaphor (the subtype of grammatical metaphor). It aims to address three issues: (1) how the criteria of measuring metaphoricity are used to explicate the continua of packing-repacking and unpacking processes[1] of ideational metaphor; (2) how the effect of the continuum of ideational metaphor reflects context, iconicity, semantic density and semantic gravity in packing-

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[1] *Process* in the expression *packing-repacking and unpacking processes* is different from *process* in a figure. The former indicates the process in which an expression is metaphorized, while the latter refers to process type which "constitutes a distinct model or schema for construing a particular domain of experience as a figure of a particular kind" (Halliday and Matthiessen 2014: 213). The former is used to explicate metaphorization, whereas the latter is used together with participant and circumstantial elements in transitivity. To distinguish them, I use the capitalized word Process to refer to process type in transitivity.

repacking and unpacking processes; (3) how the degrees of nuclearity impact the orientations of packing-repacking and unpacking processes of ideational metaphor. The answers will provide an academic lens for better understanding of English teaching and learning.

2 Theoretical background

In Systemic-Functional Linguistics, grammatical metaphor stems from stratal tension on the ground that "a stratified system has inherent metaphoric power" (Halliday 2004d: 55). The inter-stratal relation is described as a non-solidary realization between grammar and discourse semantics (Martin 1991b), or a "process whereby meanings are multiply-coded at the level of grammar" (Martin 1993: 258). Later, Halliday and Matthiessen (2004, 2014) reinterpreted grammatical metaphor as a semogenic resource of realizing the "additional layers of meaning and wording" (2004: 626, 2014: 699) which has been widely accepted and applied to linguistic discourse analysis. Linguistic discourse analysis is used to refer to "the 'British tradition' of discourse analysis and is strongly influenced by M.A.K. Halliday's systemic-functional grammar" (Renner 2019: 628). Grammatical metaphor is now taken as "a higher-order semiotic resource" (Taverniers 2017: 358) as it creates the new forms with the additional meanings through semantic junction (Halliday and Matthiessen 1999). As a subtype of grammatical metaphor, ideational metaphor embodies this semogenic or meaning-making mechanism as well.

Ideational metaphor can engender different metaphorical variants with "least metaphorical and most metaphorical" (Halliday and Matthiessen 1999: 235) as two endpoints. To respond to the continuum of metaphorization, it is beneficial to formally put forward the term repackage. This article defines repackage as a metaphorizing process in which a metaphorical variant (which has been metaphorized) is remapped between the lexicogrammatical and semantic strata again. For example, the clause *she got married to him because of love* is a metaphorical variant which is downgraded from the clause complex *she got married to him because she loved him*. The metaphorical clause *she got married to him because of love* can be repacked as the nominal group *her marriage because of love*. The concept is grounded on the recursive nature of grammatical metaphor (Martin 1991a, 1993) as well as "a metaphor scale" (Halliday and Matthiessen 1999: 235). Here metaphoricity is redefined as a relative term. The degree of metaphoricity can be measured by the amount of grammatical metaphor and the rank-shifting in the metaphorizing process. The criteria of measuring metaphoricity can shed light on the continua of packing and repacking processes. To be specific, metaphoricity increases as more grammatical metaphor works in the metaphorizing process. Metaphoricity increases when the rank shifts in the course of metaphorization. According to Systemic-Functional Grammar, "there is a scale of rank in the

grammar of every language" (Halliday and Matthiessen 2004: 9), for example, clause complex, clause, phrase or group, and word in English. When *the government supported his research* is metaphorized as *the government's support for his research*, there is a rankshift from a clause to a nominal group. The metaphorizing process breaks the natural organization of the components and makes their semantic relations "progressively less explicit" (Halliday and Matthiessen 1999: 258) in the semiotic world, such as temporal relation. Both packing and repacking processes embody the great semogenic power since "each step has enlarged the meaning potential by adding a new dimension to the total model" (Halliday 2004b: 46). The accumulative effect will eventually engender the most metaphorical variant.

Unpacking is also a relative concept. It was argued that "unpacking metaphors, and finding agnate forms, are also central" (Ravelli 2003:43). A metaphorical expression may be unpacked again and again to build a solidary relation between grammar and semantics so as to realize a congruent construal of our world. The continuum of unpacking is stemmed from the recursive nature of grammatical metaphor as well. Ideally, the unpacking process stops until no metaphorical effect is involved. The higher degree of metaphoricity an expression embodies, the more efforts it will require to construct a congruent variant. Unpacking reduces the semiotic distance with the reality and engenders the information which is supposed to be interpreted in the context, which facilitate the English learners in better understanding the world.

As regards the metaphorizing procedure, Halliday (2004d) proposed a "general drift" (2004d: 76) to explicate the direction of metaphorizing a component in clausal structure: "relator → circumstance → process → quality → entity" (2004d: 76).[2] Though it does not mean that all the metaphorical variants strictly adhere to this drift, it does prove that "everything else can end up as a noun" (Halliday 2004d: 77). The drift was instantiated to specify how a congruent component could be gradually packed as a noun as Participant in a chain:

(a)   Heating costs are minimal because the weather is mild.   relator   ↓

(b)   Heating costs are minimal because of the weather.   circumstance   ↓

(c)   The mild weather results in minimal heating costs.   process   ↓

(d)   The minimal heating costs are ascribable to the weather.   quality   ↓

(e)   The cause of the minimal heating costs is the weather.   entity

<div align="right">(Taverniers 2017: 359)</div>

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2 Halliday (2004d) argued that these types of grammatical metaphor were not exhaustive but significant for his research.

The general drift exemplifies how an element is gradually transcategorized by means of ideational metaphor, but leaves room for transcategorization when both ideational and interpersonal metaphors are involved. The contextual factors were not taken into account in the orientation of the metaphorizing processes, either.

Regarding the orientation of unpacking, Martin (1991a, 1992, 1993) proposed three steps from the perspective of metafunction: the first step is to unpack logical metaphor and experiential metaphor which is closely related to logical metaphor since "logical metaphor entails experiential metaphor" (Martin and Matruglio 2020: 104); the second step is to de-metaphorize the other experiential metaphor; the third step is to unpack interpersonal metaphor. But there were no further explanations of the principles of unpacking or the impacting factors such as context and iconicity in the de-metaphorizing processes.

Any "meaning can be more or less closely related to context" (Martin 2011: 51). Let alone the metaphorical expressions. Ideational metaphor as a subtype of grammatical metaphor is closely related to context and iconicity of language in the tradition of Systemic-Functional Linguistics. It was illustrated that an expression embodied strong iconicity with the reality in the "congruent configurations of process, participant and circumstance" (Martin and Matruglio 2020: 107) from the socio-semiotic perspective. The more iconic, the more context-dependent (Martin and Matruglio 2020: 103). Ideational metaphor as a subtype of grammatical metaphor can create the "distance between act of meaning and its counterpart in the real world" (Halliday 2004c: 348), by smashing the iconic relation between the semiotic meanings and the reality. When a congruent expression is packed and repacked by means of ideational metaphor, its contextual dependency declines by breaking off its natural relation with the reality on the semiotic level. The more metaphorical, the less iconic. The less iconic, the less contextual-dependent. As ideational metaphor has the great power of generating the heavily-loaded semiotic meanings in "a semiotic alternative universe" (Halliday 2013: 78), it can strengthen semantic density which was coined to indicate "the degree of condensation of meaning" (Maton 2014a: 153) by making the expression complex and implicit (Oteíza 2020), but weaken semantic gravity which was developed to show "the significance of context-dependence for understanding regions" (Maton 2014a: 208) or "the degree to which meaning relates to its context" (Maton 2014b: 110), both of which shed light on the continua of packing-repacking and unpacking processes of ideational metaphor. Although some scholars have studied the relationship between grammatical metaphor and semantic gravity and semantic density (Martin 2013; Maton 2014a; 2016; Poulet 2016), they have focused on knowledge structures, but not the continua of metaphorizing and de-metaphorizing processes. This article will illustrate how the effect of the continuum of ideational metaphor reflects context, iconicity, semantic density and

semantic gravity in packing-repacking and unpacking processes, which is one of the research objectives.

Besides, ergative structure was developed to illustrate how different components (such as Medium, Process, Agent, Range and Beneficiary) were organized in an English clause in Systemic-Functional Grammar. These components are different from each other in light of nuclearity. Process is the center of an English clause. Medium "through which the process is actualized" (Halliday and Matthiessen 2004: 284, 2014: 336) constitutes the nucleus together with Process. Agent, Range and Beneficiary are "additional participants "(Halliday and Matthiessen 2014: 348). Based on nuclear relations in clause and the general drift (Halliday 2004d), we can see that ideational metaphor can provide a peripheral element with an opportunity of enhancing the degree of clausal nuclearity, so as to become the nucleus of an activity. The orientation towards nucleus can shed light on the directions of packing, repacking and unpacking processes of ideational metaphor.

3 Continua of packing and repacking processes of ideational metaphor

A congruent expression may be packed as a metaphorical variant which can be further metaphorized by ideational metaphor. The metaphorical variants enact as the instantial metaphorical variants. The metaphorizing process stops till a systemic metaphorical variant is realized as a "congruent construal of a new entity" (Halliday 2004a: 127).

The more ideational metaphors involve, the more complex a metaphorical variant will be. The semantic complexity resulted from ideational metaphor can
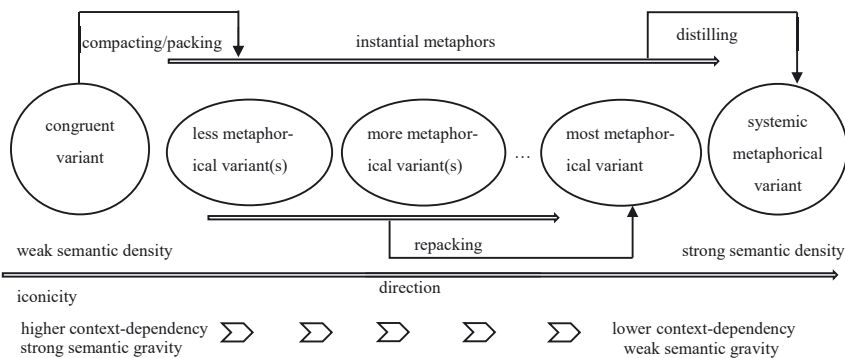

Figure 1: Continua of the packing-repacking processes of ideational metaphor.

strengthen semantic density according to its implicitness (Oteíza 2020). As the packing and repacking processes continue, the iconic configuration of the components is broken off. It requires the less contextual information to interpret the metaphorical variants. Ideational metaphor, to a great extent, weakens an expression's semantic gravity. These parameters construct a paradigm which shed light on the continua of packing and repacking processes of ideational metaphor (see Figure 1).

It is significant to discuss the continua of packing and repacking processes of ideational metaphor systemically since it tells us how ideational metaphor works in knowledge construction in the semiotic world from the logogeneric perspective, and informs us of how the linguistic world interacts with the reality.

3.1 Instantiation of continua of packing-repacking processes of ideational metaphor

A congruent expression may be packed and repacked by means of ideational metaphor to reconstrue the experiential world. Take (1) for example.

(1)   (1-a) It is important for us to acquire English as a second language. [congruent]

        (1-b) The acquisition of English as a second language is important for us. [less metaphorical]

        (1-c) The importance of acquiring English as a second language [more metaphorical]

        (1-d) The importance of the acquisition of English as a second language [most metaphorical]

(1-a) is a congruent expression which is frequently uttered in the ESL (English as a Second Language) classes. But the identities of the speaker and the addressees are required to be confirmed in the context. (1-a) can be packed as (1-b) by nominalizing *to acquire English as a second language* as the nominal group *the acquisition of English as a second language*, or as (1-c) by downgrading *it is important* … to the nominal group *the importance of* … The nominalizing and downgrading processes condense the clause (1-a) into the nominal groups (1-b) and (1-c) respectively, which strengthen its semantic density. Now that ideational metaphor relatively smashes (1-a)'s iconicity by separately removing the original Process *acquire* in (1-b) and the temporality in (1-c), (1-b) and (1-c) become less context dependent. And its semantic gravity, to a certain extent, weakens in these two separate packing processes.

Though (1-b) and (1-c) are realized by the same amount of ideational metaphor, they are different in metaphoricity when the rankshift is taken into account. To be

specific, when the verbal group *to acquire English as a second language* in (1-a) is nominalized as *the acquisition of English as a second language* in (1-b), no rankshift involves in the metaphorizing process. On the contrary, when the clause *It is important …* in (1-a) is downgraded to the nominal group *the importance of …* in (1-c), there is a rankshift from a clause to a group. Since the rankshift by ideational metaphor is taken as a criterion of measuring the scale of metaphoricity, (1-c) is considered to be more complex and metaphorical than (1-b).

Afterwards, the metaphorical variant (1-b) can be repacked as (1-d) by downgrading the clause *it is important …* to the nominal group *the importance of …* with a rankshift involved, while (1-c) may be remetaphorized as (1-d) by nominalizing *to acquire English as a second language* as the nominal group *the acquisition of English as a second language* with no rankshift. These two separate repacking processes further strengthen the semantic density by condensing more information load, but weaken the contextual dependency by reducing their iconicity with the reality. The semantic gravity of (1-d) becomes lighter than those of (1-b) and (1-c) (see Table 1).

The above packing and repacking processes can be encapsulated as follows: the congruent expression (1-a) is packed as (1-b) or (1-c) which is repacked as (1-d) which cannot be further repacked. But (1-d) is not a systemic metaphorical variant as it can be "unpacked – reworded in a more congruent form" (Halliday 2004d: 87). The packing and repacking processes create the relatively independent zone with the loss of the original temporality, Process *acquire* and the addressee *us*. It does not mean that these metaphorical variants are totally independent of context. Instead, all of them are rooted in the context. But their semantic gravities are lighter than (1-a).

Among these three metaphorical variants, (1-d) is located at the ultimate endpoint of packing and repacking processes due to the greatest metaphoricity with

Table 1: Congruent/metaphorical statuses of four instances in (1).

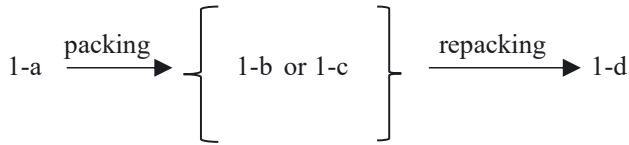|	Congruent/metaphorical status	Metaphoricity	Contextual dependency	Semantic gravity	Semantic density
1-a	congruent	none (0)			
1-b	metaphorical [verbal group-nominal group]	less (1 metaphor)	↑	↑	↓
1-c	metaphorical [clause-nominal group]	more (1 metaphor + rankshift)			
1-d	metaphorical [verbal group-nominal group + clause-nominal group]	most (2 metaphors + rankshift)			

Figure 2: The parallel packing and repacking processes in (1).

two metaphors and a rankshift involved. But the more metaphorical variant (1-c) cannot be repacked from the less metaphorical one (1-b). Instead, both (1-b) and (1-c) are packed through one step of metaphorization from (1-a) (see Figure 2). The metaphorical variant (1-b) is commonly taken as the initial package because of its less metaphoricity.

It happens that a congruent expression is packed, repacked and then repacked again by means of ideational metaphor to re-construe our experiential world. The effect of the continuum of ideational metaphor reflects the changes in context-dependency, iconicity, semantic density and semantic gravity respectively, which illustrates the multidimensional paradigm of packing-repacking processes of ideational metaphor in Figure 1. Take (2) for example.

(2)　　(2-a)　He possibly will refuse what you ask for. [congruent]
　　　(2-b)　He possibly will refuse your request. [less metaphorical]
　　　(2-c)　His refusal of your quest will be possible. [more metaphorical]
　　　(2-d)　The possibility of his refusal of your request [most metaphorical]

(2-a) is a congruent expression with a "direct line of form to meaning to experience" (Halliday 1985: xix, 2000: F45) or "a single layer of coding" (Martin 1992: 17) in which the identities of three Participants (*he, you* and the implicit *I*) are required to be confirmed in the context. (2-a) can be packed as (2-b) by nominalizing *what you ask for* as *your request*. It is an objectified process since its original temporality in tense and its action *ask for* are removed in the nominalizing process. In this package, (2-b)'s semantic density strengthens in terms of implicitness, but its semantic gravity weakens. Since nominalization smashes the iconic configuration of the subordinate clause with the reality, (2-b)'s contextual dependency becomes weak.

The metaphorical variant (2-b) can be repacked as (2-c) by nominalizing the verbal group *refuse your request* as the nominal group *His refusal of your request*. If (2-a) is taken as the starting point, the packing and repacking processes can be encapsulated as follows: (2-a) is metaphorized as (2-b) which is remetaphorized as (2-c). (2-c) is realized by two steps of metaphorization. Its meaning is more implicit than (2-b) since the action *refuse* is removed. The repacking process also smashes (2-b)'s iconic relation with the reality on the ground of the metaphorical configuration of the components in (2-c), which reduces its semantic dependency on the contextual factors again. The semantic gravity becomes lighter than those of (2-b).

Afterwards, the metaphorical variant (2-c) is downgraded to the nominal group (2-d). (2-d) *the possibility of his refusal of your request* is located at the ultimate endpoint of the continua of packing-repacking processes of ideational metaphor as the most metaphorical variant which cannot be further repacked. When (2-a) is taken as the starting point, (2-d) is engendered by three types of ideational metaphor: the first is nominalizing the modal adjunct *possible* as the nominal group *the possibility of…* ; the second is downgrading the clause *he… will refuse* to the nominal group *his refusal of…* ; the third is downgrading the subordinate clause *what you ask for* to the nominal group *your request*. (2-d) carries the greatest semantic density since it is the most implicit in expressing meaning in (2). (2-d)'s contextual dependency greatly reduces on ground of the losses of the original temporality (*will*) and two actions (*refuse* and *ask for*) compared with (2-a). Thus, (2-d)'s semantic gravity becomes the lightest. The continua of packing and dual repacking processes in (2) can be encapsulated as follows: (2-a) is initially packed as (2-b) which is repacked as (2-c) which is further repacked as (2-d) (see Figure 3).

2-a $\xrightarrow{\text{packing}}$ 2-b $\xrightarrow{\text{repacking}}$ 2-c $\xrightarrow{\text{repacking}}$ 2-d

Figure 3: Continua of the packing and dual repacking processes of ideational metaphor in (2).

3.2 Metaphorical orientation and clausal nuclearity

As argued in Section 2, the degrees of nuclearity can be used to explicate the orientation of packing and repacking processes of ideational metaphor. Based on the nuclear relations in clause and the general drift (Halliday 2004d), it is inferred that an element tends to be metaphorized as the nucleus in ergative structure. Take (1) for

Table 2: Metaphorization, ergative functions and nuclear relations in (1).

1-a	transitivity	It	is	important	for us	to acquire English as a second language
	ergative		Process	Range	Agent	Medium
	nuclear relation		Center	Nucleus	Margin	Nucleus
1-b						Nominalization =Medium; =Nucleus
1-c			Downgrade: clause to group			
1-d			Downgrade: clause to group			Nominalization

example. The metaphorizing processes, ergative structure and nuclear relations will be analyzed to instantiate the metaphorical orientation (see Table 2).

As regards the functions in ergative structure, *to acquire English as a second language* functions as Medium on the ground that the act can play the role of Participant (Halliday and Matthiessen 2014: 261). It is nuclear to Center *is* in (1-a). It may be initially packed as *the acquisition of English as a second language* in (1-b) without changing its nuclear degree or ergative function. The packing process adheres to the orientation of metaphorization towards the nucleus.

The component *important* plays the role of Range to "specify the range or domain of the process" (Halliday and Matthiessen 2014: 346) in ergative structure which is analogous to Attribute in Attributive clause. According to Martin & Rose's nuclear relations (2007), Range (quality) is nuclear to Center just like Medium. Based on this argument, *important* as Range is nuclear to *is* as Center in (1-a) just as *to acquire English as a second language* as Medium is nuclear to *is* as Center. Thus, the component *important* can also be packed at the first stage.

Since both *to acquire English as a second language* and *important* are located at the nuclear zone according to their clausal nuclearity, they have the equal chance of being packed to realize semantic junction at the first stage, which elicits the parallel packing and repacking processes (see Figure 2).

The metaphorical orientation towards the nucleus can also be used to explain the continua of packing and dual repacking processes of ideational metaphor in 2-a-b-c-d in terms of metaphorizing processes, ergative structure and nuclear relations (see Table 3).

The subordinate clause *what you ask for* in (2-a) as a whole performs the function of Medium which is not "the doer, nor the causer, but the one that is critically involved" (Halliday and Matthiessen 2014: 343). In spite of its nuclear relation with Process *refuse*, *what you ask* is easily packed as *your request* in (2-b) at the first stage of metaphorization due to its loose semantic density. The nominalized group *your*

Table 3: Metaphorization, ergative functions and nuclear relations in 2-a-b-c-d.

2-a	Transitivity	He	possibly	will	refuse	what you ask for
	Ergative	Agent	Modal adjunct		Process	Medium
	Nuclear relation	Margin	Outside		Centre	Nucleus
2-b						Nominalized; =Medium; =Nucleus
2-c		↑Partial Medium/ Nucleus			Nominalized; =Medium; ↓ Nucleus	
2-d			Nominalized			

request still plays the role of Medium in ergative structure and maintains the nuclear status to Process *refuse*. Afterwards, *refuse your request* in (2-b) is repacked as *his refusal of your quest* which functions as Medium in (2-c). As *refuse* carries the more information load and the heavier semantic gravity than *what you ask for*, it is repacked at the second stage. The repacking process also leads to the change of clausal structure. And its clausal nuclearity changes from Centre to Nucleus, which coincides with the orientation of metaphorization towards the nucleus. Meanwhile, Agent *he* in (2-b) is merged into the nominalizing process by being transformed to the premodifier *his*. Its clausal nuclearity changes from Margin to the part of Nucleus, which also adheres to the orientation of metaphorization towards the nucleus. After (2-c) is nominalized as the nominal group (2-d) in the second repacking process, there is no clausal nuclearity any more. In sum, the components in (2-a) are packed, repacked and repacked again towards the nucleus in ergative structure. The order of metaphorization is that Nucleus precedes Center+Margin which precede Outside in 2-a-b-c-d.

4 Continua of unpacking processes of ideational metaphor

To better understand a metaphorical expression realized by ideational metaphor, it is beneficial to unpack it as a possible congruent variant. In the unpacking process, the interstratal tension between lexicogrammar and semantics (Hao 2020) can be released to unravel the non-solidary relation between the metaphorical expression and the reality.

But unpacking is not the total reversal of package and repackage. It does not start with a systemic metaphorical expression which "cannot be unpacked" (Halliday 2004d: 87), but an instantial one which can be the most, more or less metaphorical expression. The ideal direction is that the most metaphorical expression is initially unpacked as a more metaphorical variant which can be further unpacked as a less metaphorical one. The unpacking process continues until a possible congruent variant is realized. As a metaphorical expression is unpacked, a semantic junction which is stemmed from ideational metaphor is deconstructed from the heavy information load. Its original semantic density reduces in light of explicitness. As a metaphorical expression is unpacked as a congruent variant, the less iconic configuration is transformed into an iconic one which rebuilds a solidary relation with the reality. The orientation of less iconicity towards iconicity in the unpacking processes also implies that contextual dependency increases in the demetaphorizing processes. And semantic gravity becomes heavier. The above parameters construct a
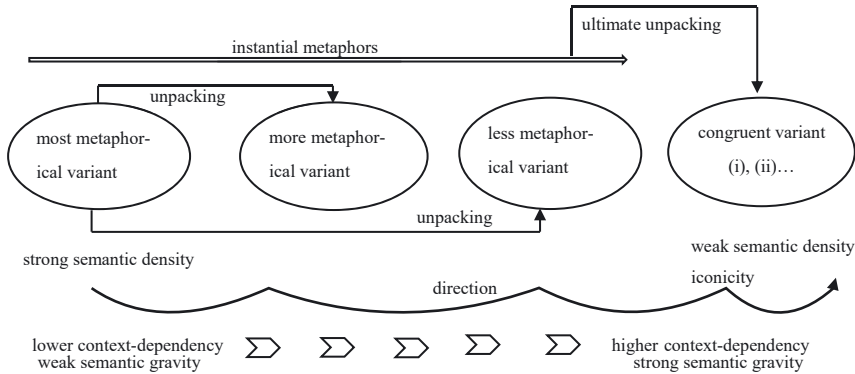
Figure 4: Continua of the unpacking processes of ideational metaphor.

multidimensional paradigm that explains the continua of the unpacking processes of ideational metaphor (see Figure 4).

However, due to the individual's linguistic proficiency and communicative purposes, it is possible to generate different agnate congruent variants or "a number of the congruent unpackings" (Martin 1992: 410). We are faced with the embarrassing situation "without any clear principle for preferring one over another" (Halliday 2004b: 48). But in the multidimensional reality, we do not need the absolute answer. If a congruent variant can explain a target metaphorical expression, it is a qualified product of the demetaphorizing process.

4.1 Instantiation of continua of unpacking processes

Take (3-a) *the patient's subsequent inability to recall the occurrence* (Halliday 2008: 96) for example. It is a metaphorical nominal group in which three components (*subsequent*, *inability* and *occurrence*) have the potential of being unpacked.

(3)   (3-a)   the patient's subsequent inability to recall the occurrence
                [most metaphorical]
        (3-b)   the patient's subsequent inability to recall what occurs
                [more metaphorical]
        (3-c)   the patient's inability to recall what occurs subsequently
                [less metaphorical]
        (3-d)   The patient is not able to recall what occurs subsequently [congruent]

Initially, the noun *occurrence* in (3-a) can be unpacked as *what occurs* in (3-b) by recovering the action *occurs* and the corresponding Participant *what*. These two

components are no longer condensed in a noun but restructured in a subordinate clause. Thus, (3-b)'s semantic density becomes looser than that of (3-a). If we want to know *what occurs*, it is indispensable to turn to the contextual factors. The contextual dependency, to a certain extent, strengthens in this unpacking process. And (3-b)'s semantic gravity becomes heavier than that of (3-a). Afterwards, the premodifier *subsequent* is demetaphorized as the temporal adjunct *subsequently* in (3-c) which rebuilds the temporal relation with the action *recall* in the reality. As the relation between *subsequently* and *recall* becomes explicit, (3-c)'s semantic density becomes looser than (3-b). But *subsequently* is a vague temporal adjunct which requires to be understood in the context. Therefore, its contextual dependency strengthens and semantic gravity becomes heavier than those of (3-b). Later, *inability* in (3-c) is unpacked as *not able* as Attribute of the relational clause (3-d) to highlight the attributive nature of *the patient*. This unpacking effect makes (3-d)'s semantic density looser in this clause. But its contextual dependency strengthens since this unpacking process produces the iconic configuration of Senser+Process+Phenomenon in (3-d) to the reality. And its semantic gravity becomes heavier than that of (3-c).

In sum, the degrees of metaphoricity of (3-a), (3-b), (3-c) and (3-d) decline in the continua of the unpacking processes of ideational metaphor according to the amount of metaphorical elements. The semantic density becomes loose since a nominal group is finally demetaphorized as an independent clause+a subordinate clause in (3-d). As the congruent expression (3-d) embodies the iconic configuration of the activity in the reality, its interpretation is greatly dependent on the contextual factors. (3-d)'s context-dependency is stronger than (3-a), (3-b) and (3-c). And its semantic gravity becomes heavier than those of the other expressions in (3) (see Table 4).

Table 4: Metaphorical/congruent statuses of four instances in (3).

	metaphorical/congruent	metaphoricity	context-dependency	semantic gravity	semantic density
3-a	most metaphorical				
3-b	more metaphorical [nominal group-subordinate clause]				
3-c	less metaphorical [modifier-environmental element(temporal)]				
3-d	congruent [nominal group-clause]				

4.2 Unpacking orientation and nuclearity in nominal group

There is the question: why is *occurrence* initially unpacked before *subsequent* which precedes *inability* in the continuous unpacking processes? It can be explicated in light of the functions of the elements in the experiential and logical structures and nuclear relations in a nominal group (see Table 5).

In the nominal group (3-a), *occurrence* is a part of Qualifier in the experiential structure and of Postmodifier in the logical structure. According to nuclear relations in a nominal group (Martin 1992; Martin and Rose 2007), Qualifier/Postmodifier is a peripheral element to Thing that functions as Center. Based on this argument, *occurrence* as Periphery does not carry too much information load related to *inability* as Center. And its semantic gravity is lighter owing to its less contextual dependency. Thus, *occurrence* is easy to be unpacked, which does not change the group structure or its relation with Center.

In the nominal group (3-b), the adjective *subsequent* functions as Epithet in the experiential structure and Premodifier in the logical structure. It is nuclear to *inability* that performs the function of Center in this nominal group. As it is unpacked as Periphery *subsequently* in (3-c), *subsequently* is directly related to *recall* but not *inability*. Due to the indirect relation with Center *inability*, *subsequent* may be unpacked at the second stage.

In the nominal group (3-c), the noun *inability* functions as Thing in the experiential structure and Head in the logical structure. It is a central element in the metaphorical nominal group (3-a), which carries the most information load. Its semantic gravity is lighter than others due to the less contextual dependency. Once it is totally unpacked, the group structure will completely change. Therefore, it is indispensable to unpack *inability* at the final stage so as to make the agnate congruent variant widely acceptable.

To sum up, owing to the less iconicity with the reality, it is necessary to unpack a metaphorical expression so as to make an appropriate interpretation. The

Table 5: Unpacking, experiential and logical functions and nuclear relations in a nominal group in (3).

Nominal group (3-a)	the	patient's	subsequent	inability	to recall the occurrence
Function (experiential)	Deictic	Epithet$_1$	Epithet$_2$	Thing	Qualifier
Function (logical)	Premodifier	Head	Postmodifier		
Nuclear relation		Nucleus	Center	Periphery	
3-b					unpack;=periphery
3-c			↓ unpack; periphery		
3-d			unpack; ↓ nuclear		

nuclear relations can shed light on the orientation of the unpacking stages. When a metaphorical element is farther away from Center according to its nuclearity, it carries the less information load related to Center. It is possible to be initially unpacked as a congruent element without changing the original structure. The central element may be finally unpacked, which eventually rebuilds the solidary relation with the reality.

5 Packing-repacking versus unpacking

There are six major differences between the packing-repacking and unpacking processes of ideational metaphor:

(1) *Component.* A congruent expression and a systemic metaphorical variant are two endpoints of the continua of the packing-repacking processes of ideational metaphor. But a systemic metaphorical expression is excluded from the continuous unpacking processes because it has become a "congruent construal of a new entity that has been created by distillation" (Halliday 2004a: 127).

(2) *Output.* The packing and repacking processes of ideational metaphor may generate a systemic metaphorical construct as a technical term which "has taken on a new, nonmetaphoric life of its own" (Halliday 2004d: 88). However, the unpacking processes aims to elicit a possible congruent variant with the agnate meaning.

(3) *Procedure.* A congruent expression is commonly packed and repacked, which accommodate to human cognition. It requires more efforts to handle with the information load with "the whole consideration of language in the construal of experience" (Halliday and Matthiessen 1999: 272). But a metaphorical expression may be directly unpacked as a congruent variant if one is sensitive to the metaphorical expression and its agnate congruent variant.

(4) *Context-dependency.* A congruent expression is the iconic configuration of the reality. The packing and repacking processes of ideational metaphor can smash its iconicity, and create the semiotic reality "detached from ordinary experience" (Halliday and Matthiessen 1999: 271). On the contrary, the unpacking process turns a metaphorical expression into an agnate congruent variant which "seems very much more ordinary (and perhaps more accessible) than the original text" (Eggins 2004: 98). It attempts to rebuild the iconic relation with the reality.

(5) *Semantic density and semantic gravity.* Semantic density and semantic gravity are two parameters in specifying the continua of packing-repacking and unpacking processes of ideational metaphor. An element with the loose semantic density and the strong semantic gravity is easily packed, which makes

it more complex and/or implicit. An element without too much information load related to Center but with the light semantic gravity is easily unpacked at the initial stage to keep the original structure intact.

(6) *Nuclearity*. Ideational metaphor provides a peripheral element with an opportunity of enhancing the degree of clausal nuclearity so as to become the nucleus of the activity. Nucleus is the destiny of the continua of packing and repacking processes of ideational metaphor. But in the unpacking processes, an element in the lower degree of nuclearity tends to be initially unpacked so that the demetaphorized product can be easily accepted.

The unpacking processes are not the total reversal of the packing-repacking ones, both of which deserve further research.

6 Conclusions

Since "our present-day world … consists so largely of metaphorically constructed entities" (Halliday and Matthiessen 2014: 730), it is important to understand the continua and orientations of the packing-repacking and unpacking processes of ideational metaphor from the multidimensional perspective, such as metaphoricity, context, iconicity, semantic density, semantic gravity and nuclearity. These parameters constitute the analytical paradigms of the continua of metaphorizing and de-metaphorizing processes proposed in this article, which can unfold the relationship between the semiotic world and the reality and respond to the social semiotic perspective on language put forward by Systemic-Functional linguist Halliday (1978). The definition of repackage and the redefinition of metaphoricity provide the theoretical grounds for the analyses of the continuous processes of metaphorization and de-metaphorization. And nuclearity is taken as an important factor of illustrating the metaphorical orientation.

The explanations of the continuum and orientation of ideational metaphor have pedagogical implications. They can unfold how knowledge is reproduced in pedagogical practices, for instance, by explaining "taxonomies of highly charged technical concepts … complex sequences of rational argument" (Halliday 2013: 61) in scientific discourse. As "grammatical metaphor becomes central to the interpretation of learning" (Halliday 2007: 379), it is beneficial for the students to acquire how "to read and write grammatical metaphor" (Martin 2020b: 21), including ideational metaphor. It is also significant to train the teachers to unpack ideational metaphor in reading lessons, and to instruct the students to pack "information into metaphors in their writing" (Rose 2020: 294). In sum, the knowledge of the continuum and orientation of ideational metaphor can facilitate the English learners in unpacking the

metaphorical expressions in reading materials, and exercising the metaphorical resources in English writing. But to avoid the theories overloaded, the article does not systematically discuss the close relationship among ideational metaphor, context, semantic gravity and semantic density, which leaves room for the research in the future.

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