[Original]

On Adpositions in the Languages of the World*

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The aim of this paper is to show the semantic nature of cases and pre/postpositions in the languages of the world. More specifically, we argue that there are two possible mechanisms behind semantic changes of cases and pre/postpositions: one is what can be called 'the structure-preservation change' and the other, 'the source-oriented change'. This paper also attempts to make a contribution to some previously discussed theoretical issues, especially in the field of grammaticalization.

Key words: case, preposition, postposition, the structure-preservation change, the source-oriented change

1. Introduction

Historical linguists have long noted that grammatically distinct nominal categories and their functions may be conflated over time; this has been the case for almost all the modern Indo-European languages, for instance. The significance of this linguistic phenomenon for understanding such issues as semantic (conceptual) change, the nature of polysemy, and human cognition in general, has been recognized by more and more linguists outside the comparative historical paradigm, especially those who take functional, cognitive, or typological approaches.

The purpose of this paper is twofold. The first aim is to show the findings of Yamaguchi (2005) concerning the semantic nature of cases and pre/postpositions in the languages of the world. Among findings of Yamaguchi (2005), this paper will show what the author calls "a macro-structure" comprising four semantic spaces (which will be discussed later), and two pathways of semantic changes in the macro-structure: one is what can be called 'structure-preservation pathways,' and the other, 'goal-oriented pathway.' The second purpose of this paper is to argue how the findings

of Yamaguchi (2005) make a contribution to some previously discussed theoretical issues, especially in the field of grammaticalization.

One of the four main questions posited in Yamaguchi (2005) was what conflation patterns of semantic roles displayed by a case or adposition are possible. Based on sixty eight languages, Yamaguchi (2005) showed possible (and therefore also impossible) conflation patterns of semantic roles displayed by cases and adpositions in our sampled languages. And these possible conflation patterns of semantic roles displayed by them are, as it turned out, grouped into the following four categories; the allative-related, the locative-related, the via-related, and the source-related spaces.[1]

2. On methodology

As mentioned above, one major aim of Yamaguchi (2005) was to find possible conflation patterns of semantic roles expressed by cases and adpositions of natural languages. And for this purpose, we must investigate relevant (grammatical) categories of languages, but a question is what languages, or how many languages should be examined. Yamaguchi (2005) followed the procedures employed for Gramcats sample, created by

Table 1   The Primary sample (Yamaguchi 2005: 46)

Abipon (Ge-Pano-Carib), Abkhaz (Caucasian), Alyawara (Australian), Bari (Nilo-Saharan), Buriat (Ural-Altaic), Chacobo (Andean-Equatoria), Cheyenn (Macro-Algonquian), Dakota (Macro-Siouan), Guaymi (Macro-Chibchan), Inuit (Unaffiliated), Karok (Hokan), Koho (Austroasiatic), Kui (Dravidian), !Kung (Khoisan), Lahu (Sino-Tibetan), Margi (Afroasiatic), Modern Greek (Indo-European), Motu (Austronesian), Mwera (Niger-Kordofanian), Palantla Chinantec (Oto-Manguean), Papago (Aztec-Tanoan), Shuswap (Salish), Slave (Na-dene), Tok Pisin (Creoles), Yagaria (Indo-Pacific), Zuni (Penutian)

Table 2   The Secondary Sample (Yamaguchi 2005: 46)

Arabic (Afroasiatic), Baka (Afroasiatic), Bihari (Indo-European), Burushaski (Language Isolates), Diyari (Australian), Dogon (Niger-Kordofanian), English (Indo-European), Ewe (Niger-Kordofanian), Evenki (Ural-Altaic), Finnish (Ural-Altaic), French (Indo-European), Ga (Niger-Kordofanian), German (Indo-European), Hausa (Afroasiatic), Hualapai (Hokan), Hungarian (Ural-Altaic), Indonesian (Austronesian), Island Carib (Andean-Equatorial), Japanese (Unaffiliated), Kashimiri (Indo-European), Kannada (Dravidian), Korean (Unknown), Lingala (Niger-Kordofanian), Malayalam (Dravidian), Maltese (Afroasiatic), Marathi (Indo-European), Mongolian (Ural-Altaic), Ngiyambaa (Australian), Punjabi (Indo-European), Spanish (Indo-Eurorpean), Sumerian (Language Isolates), Tibetan (Sino-Tibetan), To'aba'ita (Austronesian), Turkish (Ural-Altaic), Vayu (Sino-Tibetan), Welsh (Indo-European), Yoruba (Niger-Kordofanian), Zande (Niger-Kordofanian)

Bybee, Perkins, and Pagliuca with special attention to, among other things, "how to achieve universality in selecting languages to study," and "how to achieve comparability in the information about those languages" (Bybee et al. 1994: 27). This sample was random, stratified, and the sample's seventy-six languages were chosen to be maximally unrelated to one another. The difference between the Gramcats sample and the sample used in Yamaguchi (2005) is that the latter has chosen only twenty-six languages from the sample. Thus it is obvious that our sample does not provide as much information as the Gramcats sample, but this sampling method allows us to examine each language more thoroughly than would have been possible otherwise. The followings are the languages used in this study.[2]

According to the Voegelin and Voegelin (1978)'s classification of the world languages, the languages above, no single language belonging to the same phyla, avoids every possible genetic bias, but this ideal situation is only attainable by limiting the number of languages too far from being sufficient: fewer than thirty languages may not provide sufficient information.[3] For this reason, another kind of supplementary sample will be suggested and called 'the secondary sample' to contrast this with the first sample, which will be called 'the primary sample.' It must be admitted that the secondary sample is not as carefully controlled a sample as the primary sample to introduce as little bias as possible. The advantage of the use of secondary sample, despite the fact that this sample is not free of genetic and geographical biases, is to provide a greater range of language data, and to reconfirm some results taken from the small size of the primary sample.

So far, we have used the term, case(s) and adposition(s) without any definition. We will follow the definition in (1) in order to make explicit criteria to find exactly which forms should be coded in our study.

(1) Cases and adpostions to be examined in this study are the explicit and identifiable grammatical morphemes that display one or more types of semantic relations between a particular nominal and a verb or predicate (that is, semantic roles), and which do not primarily express grammatical relations.

This study, following Haspelmath (1997: 5), assumes that "a study in [partial] typology must be based on mixed functional-formal definition, i.e. the phenomena that are compared across languages are delimited by both functional (or semantics) and formal conditions." To mention briefly some terms of the above definition (more detailed explanation for the definition of nominal grams, and why similar grammatical items are excluded, see Yamaguchi 2005), the term 'explicit' excludes word order, and the term 'identifiable' leads us to the exclusion of what has traditionally been called 'case' in highly inflectional languages such as Latin and Greek. The main reason to eliminate these traditional cases of highly inflectional languages is a practical one: it is notorious by difficulty to deter-

mine their case system. And as for the expression, "which do not primarily express grammatical function," the author makes the assumption that there are two different kinds of morphological forms (cases) associated with nouns: one functions syntactically (i.e. its primary function is to express grammatical relations) and the other, semantically (i.e., its primary function is to express semantic relations). It should be mentioned that the term *primarily* is important, as many traditional works have stated explicitly that there is not absolute boundary between these functions or relations. Admitting that there is no clear-cut line between the two categories, this study nevertheless follow this tradition, for grammatical forms express fewer semantic relations than semantic forms do, and often show the different nature of the motivations behind their conflation patterns (see Yamaguchi 2005: 53–57).

3. On semantic spaces

As a first analytical step, data in our language samples strongly suggest that there are four semantic categories, or semantic spaces, which encompass all the semantic roles expressed by the cases and adpositions. They are what Yamaguchi (2005) called the allative-related space, the locative related space, the via-related space, and the ablative-related space. Although Yamaguchi (2005) discussed these four semantic spaces in great detail, this paper will, due to space limitation, discuss the allative-related space, and other semantic spaces are mentioned only when necessary.

3.1 On the allative-related space
3.1.1 Data on the allative-related space

To begin with, consider the conflation patterns of semantic roles of the allative-related space in our primary and secondary samples. Semantic roles discussed in this study are as follows.

ablative: 'Apples fell *from* the tree.'
(passive) agent: 'Taro was kicked *by* Jiro.'
allative: 'He goes *to* the office by bus.'
benefactive: 'She did the shopping *for* her mother.'
cause: 'He died *from* starvation.'
comitative: 'He had dinner *with* his friends.'
comparetive: 'Taro is younger *than* Hanako.'
function: 'This box will serve *as* a table.'

instrument: 'She squashed the spider *with* a slipper.'
locative: 'Taro is *at* (*on*) the side of the road.'
manner: 'He completed the job *with* great skill.'
means: 'I got this position [*by means of*] *through* lots of hard work.'
via: 'He flew to Paris *via* London.'
possessive: 'Taro *has* a dog.'
purpose: 'He went to the Red Rooster *for* some take-away.'
recipient: 'Taro gave money *to* the poor.'
result: 'He smashed the plate *to* bits.'
substitution: 'I'll take coffee *instead of* tea this morning.'

In order to make a clear distinction between the primary and secondary samples, the examples from the former sample are given in bold-faced type.

As is obvious that only an observation on Table 3 is not enough to determine internal structure of the allative-related space (and of other three semantic spaces), Yamaguchi (2005) used the following procedures for reconstructions of semantic spaces.[4] The first procedure is to generalize the data from historically attested documents of as many languages as possible to languages that do not have such documentation. The reconstruction by this procedure may be justified from the fact that a number of instances of unidirectionality of semantic developments, or universal principles, have been reported cross-linguistically (see, for example, Bybee, Pagliuca, and Perkins 1994; Croft 1991; Heine et al. 1991a, b; Sweetser 1988). Evidence of historical developments may also be gained by "internal reconstruction and a comparison with closely related languages" (Greenberg 1978: 79). The second procedure can be characterized as localistic: this study assumes that the semantic roles of a spatial relation are linguistically and psychologically more basic than nonspatial ones, and such other roles may be appropriately hypothesized as ultimately derived from the spatial roles (see, for example, Anderson 1971, Croft 1991: Stassen 1985: 36–37). The third procedure is to assume that given a word X displaying three roles, A, B, and C and that the co-occurrence of A and C almost always implies B, then B is consid-

Table 3 Conflation patterns of allative and allative-related senses (Yamaguchi 2005: 77–78)
(Ab=ablative; Ag=agent; Al=allative; B=benefactive; Cm=comitative; Cp=comparative; Cs=cause; F=function; I=instrument; L=locative; M=manner; V=via; Po=possessive; Pu=purpose; Rc=recipient; Rs=result; S=substitution)

Conflation pattern	Language	Nominal gram
Primary sample		
Al/B/Cs/Pu/Rc/S	Abkhaz	−zə
Al/B/L/Pu/Rc	Alyawara	−ika
Al/Ab/Ag/B/Cs/Comt/I/Po/ Pu/R	Bari	ko
Al/L	Buriat	da
Cs/Pu	Buriat	−tula
B/Cs	Buriat	−tyløø
Al/Cs	Chacobo	ki
Al/Cs/I	Dakota	ʾi
Al/L	Guaymi	kukuore
Al/B/Pu/Rc	Inuit	−mut
Al/B	Karok	−ihi
Cs/Ms/Pu	Karok	kuθ
Cs/Pu	Karok	−ʾi
Al/L/I	Koho	tam
B/Pu/Rc	Kui	ki
Al/L	Kui	−ni
Al/Ab/Cm/I	Lahu	gɛ
Al/B	Margi	ànú
Al/Ab/L	Margi	ár (àr)
Cs/Pu/Rs	Margi	gà
Al/B/F/Pu	Modern Greek	ja
Al/L/Po/Rc	Modern Greek	se
Al/L	Motu	dekena
Al/L	Mwera	ku
Al/Ab/B/L/Po	Mwera	pa
Al/B/L/Pu	Shuswap	n−
Al/Ag/L	Shuswap	t−
B/Cs/I/Pu/Rc	Slave	−gho,h
B/Pu	Slave	−ko
B/Cs/Pu	Tok Pisin	bilong
Al/Ab/Cs/Cp/L/V	Tok Pisin	long
B/Cs	Yagaria	−e, −se'
Al/L	Yagaria	−vi'
Secondary sample		
B/Po/Pu	Baka	na
B/Cs/Po/Pu/Rs	Diyari	−naŋka/−ni
Al/Ag/B/L/Po/Pu/Rc	Evenki	−du
Al/Rc	Evenki	−tki
Al/B/Cs/Pu	Finnish	−Vn/−hVn
Al/Ab(?)/Cs/Comp/F/I/L/M/Po/Pu/Rc/Rs	French	a
Al/Ag/Cs/I/L/M/Pa	French	par
Al/Rs	German	in (+accusative)
Al/L//Pu/Rc/Rs	German	zu (+dative)
Al/Pu	Hungarian	−hoz/−hez/−hőz
B/F/Po/Rc	Hungarian	−nak/−nek
Al/B/Cp/F/Po/Pu/Rc	Kannada	−ge/−ige/−a:kke
B/F/Pu	Kashimiri	ba:path
Al/B/Po/Rc	Kashimiri	is/as/an
Al/Ag/B/L/Po/Pu/Rc	Korean	−ey
B./F/M/Pu	Malayalam	−aayi
Al/B/Po/Pu./Rc	Malayalam	−kkə/−(n)ə
B/Pu	Maltese	għal
Al/B/Pu	Marathi	tā
Al/Ab/Cs/Cp/L/V	Ngiyambaa	DHi
Al/B(?)/Pu/Rs/S	Ngiyambaa	−gu
Al/B/Po/Pu	Punjabi	núǔ
Al(?)/Ag/B/Cs/F/I/L/Pa/S	Spanish	por
Al/B/F/Pu	Spanish	para

ered as risen at an intermediate stage between A and C. One example is the combination of the allative, the benefactive/recipient, and the purpose role. Whenever the allative and the purpose co-occur, so almost always does the benefactive/recipient sense. The fourth procedure is to take into account language acquisition data. Based on Clark and Carpenter (1989: 11), for example, English-speaking children acquire the locative role of *from* before any other function, and then extend it to the agent and the cause roles. The fifth procedure is to assume that new meanings are typically derived from prototypical meanings (see e.g., Givon 1989, Lakoff 1987, Langacker 1991). For this purpose, consider the English preposition *with*. According to the OED, this preposition had the meaning 'opposition,' 'toward,' and 'alongside,' as well as 'accompaniment,' and 'association.' Among these concepts, 'opposition' and the allative role seem to have been more prominent than others. In fact, Bøgholm (1939: 132–33) argues that the original meaning of this preposition was in fact both 'opposition,' and the allative role. Similarly, Dekeyser (1990: 35) claims that its prototypical meaning was opposition. In this kind of situation, where authors of reference grammars indicate that at one time in the past, a particular meaning was more prominent than others, then this meaning is a good candidate to be considered as the origin for other meanings. The sixth procedure is to assume that the frequent co-occurrence of two (or more) functions reflects their conceptual intimacy (Anderson 1982: 227). Put differently, the frequency of co-occurrence of semantic functions will suggest relative semantic affinity or 'closeness' within the same space.[5] For example, the cause role occurs with the purpose role more frequently than the

former does with the allative or the benefactive, and this empirical evidence strongly indicates that the cause role should be represented as being 'closer' to the purpose than the allative and the benefactive are.

The above data and six procedures lead to the following diagram of the semantic space of the allative-related functions.

Before proceeding any further, two things should be mentioned concerning Fig. 1. First, the 'spatial-as-basic' assumption, and historical documents of many languages strongly suggest that the allative sense should be the source of other allative-related roles, never vice versa, and certainly this is also true of the relation between the allative and its temporal sense. But one problem arises for our study: spatial and temporal concepts are so intimately related, and then very often one cannot tell whether the spatial or temporal role is responsible for the later developments of other abstract roles. For example, does the benefactive role develop from the locative role or the temporal role? Because of this problem, we will treat these two concepts as a unitary spatiotemporal concept, and will not attempt to answer the question of which role is responsible for the development of other, more abstract roles. Second, morphosyntactically, there are two types of possessive expressions (Heine 1997: 86): one is what can be called attributive or adnominal possession ('Taro's dog'), and the other is what can be called predicative or verbal possession ('Taro has a dog'). It should be emphasized that, following our definition of the cases and adpositins as 'morphemes that display one or more types of semantic relations *between a particular nominal and a verb or predicate*', the possessive expressions relevant to our study are the
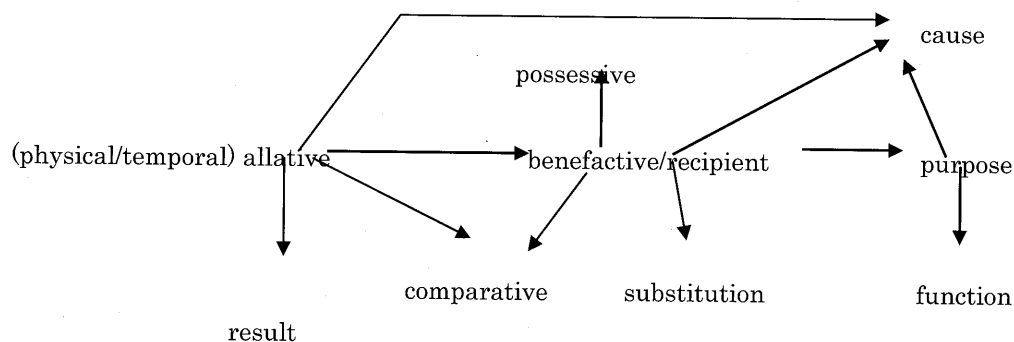

Fig. 1 (Yamaguchi 2005: 80)

latter type. For more detailed discussion on the allative-related space, and other three semantic spaces, see Yamaguchi (2005: 77–99).

4. On a Macro-structure Comprising the Four Semantic Spaces

Similar to the allative-related roles, Yamaguchi (2005) made an observation on the data of combination patterns of semantic roles in other three semantic spaces: the ablative-related space, the via-related space, and the locative-related space. The aim of this section is to show how these four semantic spaces are related to one another.

4.1 Relations of the four spatial roles

To begin with, let us focus on the four spatial roles first and consider their extensions later. For reasons discussed below, we will suggest the following configuration of the four spatial roles, indicating their relative conceptual closeness.

ablative   path   locative   allative

Fig. 2   Configuration of the four spatial functions (Yamaguchi 2005: 147)

lowing configuration of the four spatial roles, indicating their relative conceptual closeness.

As previous studies have suggested (e.g., Anderson 1971, Ikegami 1987: 132), the locative and allative roles are closely related to each other. This can be supported by at least the following two facts. First, they show implicational relations, as found in the following pairs of sentences: (2a) implies (2b), as (2c) implies (2d).

(2) (a) *He has come here.*
    (b) *He is here.*
    (c) *He has gone to London.*
    (d) *He is in London (now/already).* (Anderson 1971: 119)

These examples indicate that the allative role

logically and psychologically implies the locative role; that is, 'If X goes to Y, then X is at Y' (see Ikegami 1987: 132).

Second, they frequently co-occur in our samples (see Table 3). On the other hand, our language data suggest that the conceptual distance between the ablative and the locative roles, for example, is much greater than that between the allative (and the via) and the locative. There are only few cases in our samples (Yamaguchi 2005:134–5) that show a syncretism between the ablative and the locative with no involvement of the allative sense. Consider the following implicational relations.

(3) (a) *He has gone from here to London.*
    (b) *He is not here.*

These examples provide us with further justification for positing more conceptual distance between the locative and the ablative (compared to that between the locative and the allative), since the ablative sense in (3a) implies a feature of negation in addition to the locative sense, as seen in (3b).

The via role should be located conceptually somewhere between the ablative and the locative roles, for the reason that many languages that do not possess a genuine term for the via role utilize either ablative or locative grams, or both (see Yamaguchi 2005: 126–133). This is in agreement with Anderson's (1971: 169–71) treatment of the via ('path') role as being simultaneously ablative and locative. As figure 2 indicates, the ablative function should be located conceptually closer to the locative than to the allative role. This conclusion is supported by the fact that in our samples, the syncretism of the ablative and allative roles always implies the locative role (or the comitative: see Yamaguchi 2005: 135).

Table 4   The four semantic-space structures (Yamaguchi 2005: 149)

Schematic structure	Macro-role	Semantic function
⟨● (●)⟩	LOCATION	locative, comitative, possessive
⟨●→○⟩	SOURCE	ablative, (passive) agent, cause
⟨○→●⟩	GOAL	allative, benefactive, purpose, result
⟨○→○⟩	PATH	via, instrument, manner, means

4.2 Semantic structures of the semantic roles

The conceptual locations of the four spatial roles being considered, our next task is to locate other, non-spatial roles somewhere in our conceptual domains. For this purpose, we first need to consider semantic structures of these roles. Previous studies allow us to argue that the roles of the four semantic spaces possess one of the following four structures.

The semantic roles on the right of table 4 possess the schematic structures on the left. As for correspondence between the schematic representations and semantic roles, this study follows previous studies (for LOCATION, see Quirk et al. 1985: 674, Sweetser 1988: 393; for SOURCE, see Langacker 1991, Lindstromberg 1998: 26, Quirk et al. 1985: 674, Sweetser 1988: 393; for GOAL, see Langacker 1991: 399, Lindstromberg 1998: 26, Quirk et al. 1985: 674, Sweetser 1988: 393; for PATH, see Langacker 1991: 404, Lindstromberg 1998: 26). It is worth noting that there have been very few objections to these correspondences between semantic roles and semantic structures; even in the case of scholars who do not use schematic representations, their explanations agree with the correspondences in Table 4.

To begin with, consider the semantic structure LOCATION. The diagram should read as follows: one or more entities are located in the same spatial, temporal, or conceptual domain. The locative sense expresses a static relation between a physical entity and some physical space; the comitative role typically implies two animate entities in the same physical space (see Dirven 1993, Stassen 1985: 37). Similarly, the possessive role typically implies the proximity of two entities in the physical domain.

As for SOURCE, the schematic representation should be read as 'something moves from a certain location or entity,' where the open circle indicates unprofiled (i.e., not designated). In the ablative role, some physical entity moves from a location, and time moves from some point in the case of the 'since' meaning. Similarly, the agent and cause roles imply energy moving from an entity or object toward some other entity. In the case of GOAL, the diagram should be read as 'something moves to (or toward) a certain location or entity.' This is the mirror image of SOURCE. The schematic representation of PATH should be interpreted as 'some entity via which something moves toward a destination.' The path role refers to an entity (e.g., 'tunnel,' 'road') through which a physical entity moves, while the instrument, means, and manner roles (e.g., 'He did it *with great skill.*') can be construed as an intermediate entity or event through which some energy exerted from an agent goes toward its target.

Lastly, it should be mentioned that there is no persuasive argument in previous studies for determining semantic structures for the roles such
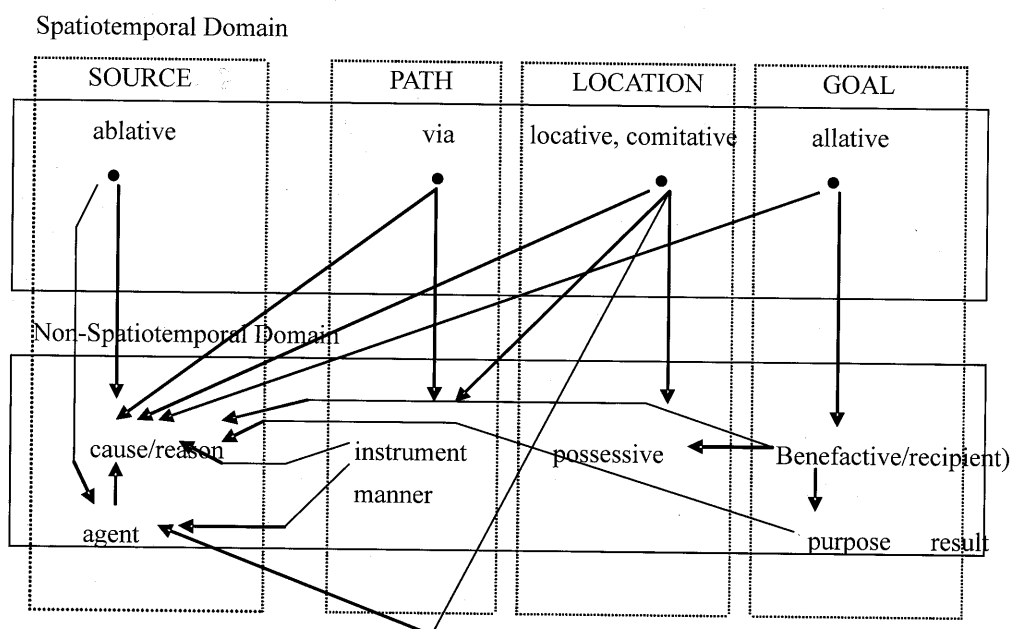

Fig. 3 (Yamaguchi 2005: 151)

as substitution, function, or comparative (but for the comparative role, see Heine 1997 and Stassen 1985). For the time being, this study will leave these issues unresolved.

4.3 The macro-structure of semantic functions expressed by nominal grams

The observations on data of our sampled languages, reconstructions of the four semantic spaces based on the procedures mentioned above, and our discussion so far allows us to construct the following macro-structure of semantic roles displayed by cases and adpositions of natural languages. The macro-structure in Fig. 3 displays semantic changes from the spatiotemporal domains to non-spatiotemporal domains. The semantic roles in the same vertical box inside dotted lines share the same semantic structure (SOURCE, PATH, LOCATION, GOAL), although they may belong to different domains (the spatiotemporal or non-spatiotemporal domain), as indicated in the horizontal boxes.[6]

Figure 3 reveals that there are two general pathways of semantic change traced by the semantic roles of nominal grams. One is what might be called the structure-preservation pathway: when semantic shifts take place, semantic roles develop into others with the same relational structures. The other is what might be referred to as the SOURCE-oriented pathway: whenever semantic change does not preserve an original image-schematic structure, semantic roles always develop toward the agent and cause roles, never toward roles subsumed under GOAL.

5. Discussion and Conclusion

As a concluding remark, let us discuss some significance of our findings to the study concerning semantic aspects of cases and adtpositions.

First, Fig. 3 suggests two possible mechanisms behind these changes: one is the structure-preservation change and the other is the SOURCE-oriented change. Semantic changes that preserve the original schemata have been proposed by many linguists (e.g. Croft 1991, Heine et a. 1991a, Sweetser 1988), but this approach is far from sufficient for predicting the semantic conflation patterns that actually occur cross-linguistically: Ya-

maguchi (2005: 77–79) shows, the syncretism of cause and purpose, having assumed as different semantic structures, as in Table 4., is one of the most frequently occurred combinations of semantic roles. And as many have put emphasis on preservation of semantic structures in semantic changes, none, as far as the author's knowledge goes, has ever argued that semantic roles always change toward abstract SOURCE roles (unless they do not change to the roles with the same semantic structures).

If our argument is valid, then it can readily be anticipated that the ablative role, being the one with SOURCE structure, should develop precisely into those with the same structure; there are no semantic roles located to its left in our model, and therefore, semantic shifts toward GOAL do not occur.[7] One natural conclusion of this fact is that the cases and adpositions with ablative role probably tend to be less polysemous than others, especially than those with the allative roles, as the former forms are (much) more limited in terms of possible semantic changes. This is indeed true, as Yamaguchi (2005: 153) shows that cases and adpositions with the ablative role occur less frequently with nonspatial roles compared with those with other spatial roles. As mentioned above, this asymmetry between the cases and adpositions with the ablative role and those with the allative role, which can be easily explained by Fig. 3, has never been discussed by previous studies on semantic changes, and therefore this finding will make a contribution to especially any theoretical studies on meaning changes.

Secondly, our findings also argue that semantic change in cases and adpositions cannot be triggered by some kind of problem solving, nor can they be instigated by communicative needs. Many linguists regard semantic change or grammaticaization as problem solving. For example, Heine et al. (1991) argue that

"Grammaticalization can be interpreted as the result of a process which has problem solving as its goal, its primary function being conceptualization by expressing one thing in terms of another." (Heine et al. 1991a: 29)

Let us consider, for the purpose of explanation, one possible scenario. Suppose that speakers of a language are required, for some reason, to express the concept UP, but their language does not have a proper term for this spatial concept. What they do next may be to choose, say, a term for 'head' as the most appropriate term, because its relational meaning is similar enough to the target concept. Note that this process is more likely to gurantee some parallelism between structures of source and target entities. Our data on syncretism of the allative-related roles in Table 3 and Fig. 3, however, show that this is not true in many cases; therefore, they strongly suggest that semantic changes of semantic roles do not take place to solve some semantic problems.

As mentioned repeatedly, Fig. 3 shows that whenever semantic change does not preserve an original semantic structure (or image-schema), semantic roles always develop toward the SOURCE roles, never toward roles subsumed under GOAL. The motivation behind this apparent bias toward SOURCE-oriented semantic change is definitely worth investigating. And if this tendency can be attributed to the fact that SOURCE is psychologically unmarked (while GOAL is marked), then this issue will be an important topic not only for the linguists, but also for psychologists, and philosophers.

Notes

1. Similar distinctions can be found in previous studies such as Anderson 1971, and Fillmore 1971. This seems to suggest that this grouping meet (at least many of) our intuition.
2. Because of space limitation, this chapter does not include any information on the materials used for our sampled languages. For any request, please contact the author at kazuyuki @nittai.ac.jp., or see the References in Yamaguchi (2005).
3. The author treated language isolates, and pidgins and creoles in a different way from Voegelin and Voeglin 1978 for the reasons discussed in Bybee et al. 1994.
4. Similar to Kortmann (1997: 176), as well as other cognitively oriented approaches (e.g., Nikiforidou 1991: 150), this study assumes

that in many cases, "synchronically related senses are also diachronically related, and that it is from synchronically derived senses that we can also *reconstruct* the direction of semantic changes in diachrony" (emphasis added. See also Bybee et al. 1994, Svorou 1994, Traugott 1986). It is necessary to establish appropriate procedures for diachronic reconstruction, because although the ideal is to depend solely on historical facts, it is usually impossible to do so, for the obvious reason that historical documents are limited to a small number of languages.

5. Note that high frequency of combinations of semantic roles does not always imply their semantic closeness: some co-occurrences appear possible only through some intervening or "bridging" (Stolz 2001: 321) role(s): function A can be conflated with function B only through their mutual relation to function C. For example, the frequent co-occurrence of the benefactive and the locative senses can be attributed to the fact that the allative (very frequently conflated with the benefactive role) and locative roles are closely related and are often expressed by a single case or adposition. One piece of evidence to support this argument is that the specific conflation patterns in question almost always assume the presence of other (spatial) roles, without which the conflation pattern does not appear in most cases.
6. Although this may cause some problems, this study treats the comitative role as a kind of locative role, as the comitative role is conceptually so closely related to the proximity role, a subclass of the locative role, as has been often argued (e.g. Anderson 1971, Luraghi 2003). This decision was made for the following two reasons. First, the comitative role prototypically suggests a spatial connection of the entitites designated by the two nouns in question (e.g. 'Taro cooks the meal *with* her friend.'), and second, the derivation patterns of the comitative role are very similar to those of the locative, explicable most reasonably by their close conceptual relation.
7. One may argue that cases or adpositions with ablative are used to express the posses-

sive role in many languages, which seem to be a counterexample. But notice that this usage seems to be limited only to attributive (or nominal, genitive) possessive constructions. Since this study focus on cases and adpositions that display the semantic relationships a nominal has with a verb, we discuss only predicative possessive constructions (e.g. 'I *have* this camera,' 'This camera *belongs to* me'), not attributive possessive constructions.

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