Path Coercions in English Motion Expressions[*]
Shotaro Namiki

1. Introduction

The meaning of a complex expression is sometimes not completely traceable to the meanings of its parts. This is thought of as a violation of the compositionality principle, in which "[a]ll elements of content in the meaning of a sentence are found in the lexical conceptual structure (LCSs) of the lexical items composing the sentence" (Jackendoff (1997:48)). To avoid this violation, a number of researchers have introduced meaning shifting mechanisms that allow syntactic elements to be composed with incompatible meanings. Semantic coercion (or just coercion) has been used as the cover term for resolutions to the violation of the compositionality principle. Semantic coercion can be classified into a number of sub-types. One of these is called complement coercions (Jackendoff (1997), Pustejovsky (1995), among others). This type is exemplified by the following sentences:[1]

(1) a. Mary began the novel. (Pustejovsky (1995:32))
    b. John finished his article. (Pustejovsky (1995:45))

The sentence in (1a) refers to a time at which Mary began some event involving a specific novel such as reading or writing, although it does not contain expressions that refer to any event. Likewise, (1b) is preferably interpreted as the event of John's finishing writing his article.

This paper concerns a new type of semantic coercion, as exemplified in (2) and (3), cited from Gehrke (2008:89) and Jackendoff (1990:72), respectively:

(2) Sharon jumped in the lake.
    a. Sharon jumped while being in the lake.
    b. Sharon jumped and (as a result) she ended up in the lake.
(3) The mouse ran under the table.
    a. The rat ran while being under the table.

    [1] The linguistic literature on semantic coercion has also treated aspectual coercions (e.g., *Fred played the sonata for one day.*), psychological coercions (e.g., *She enjoyed a book.*), and mass-count coercions (e.g., *I'll have three coffees, please.* (Jackendoff (1997:53))). See Pustejovsky (1995) and Jackendoff (1997) for details on these types of semantic coercions.

b.   The rat ran and (as a result) it ended up under the table.

Certain spatial prepositional phrases (henceforth, spatial PPs) are ambiguous between a locative and a directional interpretation.   The PP *in the lake* in (2) can be interpreted as either the location where an event occurred, or the location where a directed motion event ended up.   Likewise, *under the table* in (3) can be interpreted as either the location of an event or the goal of motion.   One might think that these spatial PPs are lexically ambiguous between the two interpretations.   Following a traditional classification of spatial Ps, we name as locative Ps spatial prepositions that are related to Place functions, and as directional Ps those that are related to Path functions.   Such a lexical approach leads to argue that the locative P *in*, for example, has the same lexical function as the directional P *into*.   Under this analysis, both locative and directional usages of locative PPs should be freely available independently of contexts.   However, this is not the case: locative PPs do not always have this ambiguity.   With motion verbs like *dance*, for example, they have only a locative interpretation, as exemplified in (4) and (5):

(4)   A gentleman and lady {danced/waltzed} under the chandelier.
    a.   They {danced/waltzed} while being under the chandelier.
    b. * They {danced/waltzed} and (as a result) it ended up under the chandelier.
(5)   They danced in the ballroom.   (Nikitina (2008:185))
    a.   They danced while being in the ballroom.
    b. * They danced and (as a result) they ended up in the ballroom.

The PPs *under the chandelier* and *in the ballroom* in the context of *dance* can only denote the location where the act of dancing took place.   The contrast between (2) and (3), on the one hand, and (4) and (5), on the other hand, raises two questions: (i) when can a locative PP be interpreted as the goal of motion, and (ii) how can we capture conditions on directional interpretations of locative PPs?

    To answer these questions, this paper explores a mechanism of directional interpretations of locative PPs in line with the Structual Ambiguity Hypothesis (Gehrke (2008), among others).   This hypothesis is summarized in (6).

(6)   The Structural Ambiguity Hypothesis: The spatial Ps *in*, *on*, *under*, and *behind* are locative only.   Any ambiguity between a directional and a locative reading is structural and not lexical.   (Gehrke (2008:88))

This paper assumes that the sense of goal is not inherent in locative Ps like *under* and *in*. This assumption leads to suggest that (2) and (3) denote directed motion events, although they do not involve a lexical item encoding a path meaning component, such as the directional P *to*.[2] Thus, directional interpretations of locative PPs can be included in cases of semantic coercion. This paper will argue that a directional interpretation of a locative PP is generated by a semantic coercion of a meaning component of a verb and that of a locative PP. Since the semantic coercion that we deal with concerns a path meaning component, we will call this semantic operation "path coercion".

This paper is organized as follows. Section 2 surveys two types of previous approaches to directional interpretations of locative PPs, namely syntactic approaches and the cognitive approach, and points out some empirical problems. Section 3 proposes the mechanism of path coercion in English. Section 4 provides supporting evidence for the proposal given in the previous section and show that the analysis of this paper can apply to other locative PPs interpreted as the goal of motion. Section 5 discusses a consequence resulting from the proposal. Section 6 concludes this paper.
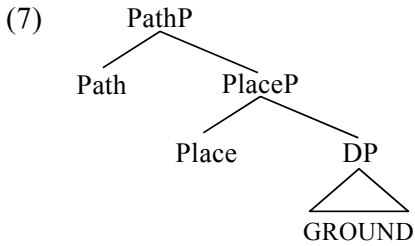
2. Previous Approaches

2.1. *Syntactic Approaches to Directional Interpretations of Locative PPs*

One of the syntactic approaches to directional interpretations of locative PPs is null or empty element analysis (Kaga (2007), Noonan (2010), Svenonius (2010)). Much of the work on directional interpretations of locative PPs assumes an empty or null element licensing the locative Ps to be interpreted directionally. The element can further fall into two types: the null Path head and the empty verb.

2.1.1. *Null Path Head Analysis*

Many authors who propose the existence of the null Path head assume that the head P is decomposed into several sub-types. Among these, following Jackendoff (1983), much of the recent work on the syntax of PPs has usually argued for the presence of Path and Place, and the former head selects the latter head (Koopman (2000), Kracht (2002), den Dikken (2003), Ramchand (2008), Svenonius (2010)). The minimal structure of PPs is represented as in (7), cited from Ramchand (2008:110):

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[2] We will make further reference to the absence of a lexical item that encodes a path meaning component in section 2.1.3. We will argue there that even the verbs in (2) and (3) do not have a path meaning component lexically.

(7)

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            PathP
           /     \
        Path    PlaceP
               /      \
            Place      DP
                       /\
                      /  \
                   GROUND
```
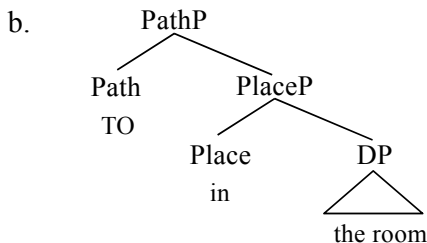
In this structure, a particular P is associated with either Place or Path. Locative Ps like *in* and *under* are merged as Place. Directional Ps, in turn, license a PathP which embeds a PlaceP. The Place head can be filled either with a silent AT or with lexically locative Ps if Path is headed by *to*. For example, the Place head *in* incorporates into *to*, resulting in the complex preposition *into*, as illustrated in (8):

(8) a. into the room

  b. [$_{PathP}$ [$_{Path}$ in$_i$-to [$_{PlaceP}$ [$_{Place}$ t_i [$_{DP}$ the room]]]]]

Recent researches (Svenonius (2010), among others) assume that the extended projections of P contain more functional structures than the structure in (7). Since complex structures of PP are not very relevant to the points that I make in this paper, I will continue to use the simple structure in (7).

Based on the structure in (7), Svenonius (2010) argues that a directional interpretation of a locative PP results from merging a null Path head with the locative PlaceP. He assumes that if no element occupies in the Path head position, this head attracts the Place head. An example of the *in* phrase interpreted directionally is represented as in (9), where the null Path head is represented as TO.

(9) a. in the room (under the directional reading)

  b.

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            PathP
           /     \
        Path    PlaceP
         |      /     \
        TO   Place     DP
              |        /\
              in      /  \
                    the room
```

Svenonius (2010:130) takes examples like those in (10) as evidence for the presence of the null Path head.

(10) a. The boat drifted (?to) behind the hill.

   b. The boat drifted (?to) inside the cave.

Svenonius predicts that if a null Path head exists, it can be pronounced under certain conditions. His prediction is borne out by (10), where the directional P *to* is marginally licit when used with a locative PP interpreted as the goal of motion.
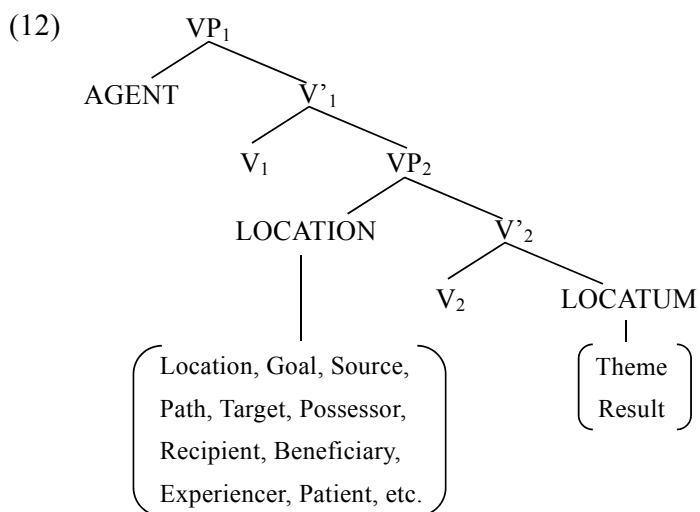
   As shown in (4) and (5) in section 1 and as has been noted in Folli and Ramchand (2005) and Svenonius (2010), directional interpretations of locative PPs are available only in certain contexts. This observation leads Svenonius to propose that it is a path meaning component of some motion verbs that licenses a null Path head. He annotates motion verbs with a subscript *Path* to indicate that they allow directional interpretations of locative PPs, as shown in (11b).

 (11) a. run in the room (under the directional reading)
    b. [$_{VPath}$ run [$_{PathP}$ [$_{Path}$ TO [$_{PlaceP}$ [$_{Place}$ in [$_{DP}$ the room]]]]]]

This approach assumes that some manner-of-motion verbs like *run* and *jump* can be either directional or locational (cf. Thomas (2001), Noonan (2010)).

2.1.2. Empty Verb Analysis
   In contrast to the null Path head analysis above, Kaga (2007) assumes another type of null elements. He discusses a typological contrast of the availability of strong resultative constructions between satellite-framed languages such as English and German and verb-framed languages such as French and Japanese, based on the thematic hierarchy proposed by Kaga (2005).

(12)

         VP$_1$
    AGENT   V'$_1$
       V$_1$ VP$_2$
        LOCATION V'$_2$
            V$_2$ LOCATUM

Location, Goal, Source, Path, Target, Possessor, Recipient, Beneficiary, Experiencer, Patient, etc.

Theme Result

                  (Kaga (2005:9))

Kaga (2005) assumes a thematic hierarchy to correspond to a syntactic structure: a syntactic structure maps a set of thematic roles to a VP shell structure, as shown in (12). In this theory, thematic roles proposed by the literature are classified into three macro-roles of AGENT, LOCATION, and LOCATUM, and these macro-roles are assigned to the three different argument positions.[3] For example, the macro-role of "LOCATUM is defined as a role assigned to an entity in motion or being located" (Kaga (2005:12)). Note that LOCATUM includes not only the micro-role of Theme but also Result. According to Kaga, since the micro-role of Result is regarded as a property that appears in (or sometimes disappears from) an entity as Location, it is a member of LOCATUM. Under this theory, the syntactic structure of an English transitive weak resultative is represented as in (13):

(13) a.　　John painted the wall red.

　　　b.　　$[_{VP1}$ John $[_{V'1}$ V$_1$ $[_{VP2}$ the wall $[_{V'2}$ painted red]]]]

(Kaga (2007:184))

The structure of the resultative sentence in (13a) is explained in the following way: the agent *John* is generated in the spec position of VP$_1$, the subject of change of state *the wall* is generated in the spec position of VP$_2$, and the adjective predicate *red* occupies the complement position of VP$_2$. Then the lower verb *painted* moves to and adjoins to the upper verb.

　　One of Kaga's (2005, 2007) important assumptions related to our interests is the availability of an empty verb that serves as the lower V head. Kaga (2007) proposes that the availability of an empty verb in the V$_2$ position determines the acceptability of strong resultatives. As Washio (1997), among others, points out, the English and German type of language allows strong resultatives, while the French and Japanese type of language does not.

(14) a.　　John hammered the metal flat.

　　　b. * Jean　a　　　martelle　le　metal　plat.

　　　　　Jean　AUX　hammered　the　metal　flat

In the English sentence in (14a), the result XP *flat* is compatible with the manner verb *hammer*, which does not denote a result state by itself. Its French counterpart in (14b), on the other hand, is not acceptable. Kaga (2007:185) suggests that the English resultative construction has the following syntactic structure.

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　[3] He refers to traditional thematic roles as "micro-roles," as opposed to macro-roles.

(15) a.   John hammered the metal flat.

  b. $[_{VP1}$ John $[_{V'1}$ V$_1$ $[_{VP2}$ the metal $[_{V'2}$ hammered-e$_v$ flat]]]]

Since the verb *hammer* does not denote a result state, it cannot take the complement. In his analysis, the empty verb *e$_v$* can add a argument-taking capacity to the lexical verb *hammer*. The lexical verb *hammered* is merged with an empty verb to form the complex verb *hammered-e$_v$*, which denotes a result state caused by the act of hammering. Then, the complex verb *hammered-e$_v$* can take the adjective predicate *flat* as its complement, as is the case with weak resultatives like (13).

  Kaga (2007) extends his analysis to directional interpretations of locative PPs. In analogy with the cross-linguistic variation of strong resultatives, the acceptability of directional interpretations of locative PPs differs between satellite-framed and verb-framed languages in general. Based on this typological contrast, he suggests that in satellite-framed languages, a manner-of-motion verb can be merged with an empty verb, which can take a locative PP as the goal argument. Consider the following example, cited from Kaga (2007:188):

(16) a.   The mouse crawled on the table.

  b. $[[_{VP1}$ the mouse $[_{V'1}$ crawled]] on the table]

  c. $[_{VP1}$ $[_{V'1}$ V1 $[_{VP2}$ on the table $[_{V'2}$ crawled-e$_v$ the mouse]]]]

(16a) has the syntactic structure in (16b) when the PP *on the table* is locative. In (16b) the unergative verb *crawl* shows up in the single VP$_1$ and the agent *the mouse* raises to the Spec of TP. Since the unergative verb *crawl* does not take a complement, the adjunct phrase *on the table* is attached to VP. (16a), in turn, has the syntactic structure in (16c) when the PP is directional. In (16c) *on the table* is generated in the Spec position of VP$_2$ as it is interpreted as the goal of motion, and *the mouse* as the Theme occupies the complement position of VP$_2$. Kaga assumes that as is the case with strong resultatives like (15), it is an empty verb that takes the locative PP as its complement.

  It should be noticed here that in Kaga's (2007) analysis, directional PPs like *to*, *into*, and *onto* phrases with manner-of-motion verbs are also selected by an empty verb: any manner-of-motion verbs do not have the ability to take any goal arguments. An example of *to* phrases with the manner-of-motion verb *swim* is given in (17), where *swam* is merged with an empty verb and *to the shore* is generated in the Spec position of VP$_2$.

(17) a.   Mary swam to the shore.

b.　　[$_{VP1}$ [$_{V'1}$ V$_1$ [$_{VP2}$ to the shore [$_{V'2}$ swam-e$_v$ Mary]]]]

(Kaga (2007:203))

An empty verb is not used without any restrictions.　　Kaga (2007:203) assumes the following condition in line with Rappaport Hovav and Levin (2001):

(18) An empty verb is merged with an active verb iff the subevents denoted by the two verbs are co-identified, that is, they are conceived of as one event.

Take the sentence in (17a) for example.　　The event described by *Mary swam to the shore* can be decomposed into at least two subevents: Mary's swimming and her reaching the shore.　　These two subevents are co-identified with respect to the causal relation:　　the subevent of swimming caused the subevent of reaching the shore.　　In the causal relation, they are temporally coextensive and unfold at the same rate:　　the subevent of swimming is accomplished when Mary reaches the shore.　　Thus, these two subevents are conceptualized as one event.　　The condition in (18) also captures the ungrammaticality of sentences like **Mary laughed to the room* (the intended meaning is "Mary entered the room (by) laughing.").　　The subevent of laughing is not generally conceptualized as the cause of the subevent of entering the room.　　In this case, an empty verb cannot be merged with the verb *laugh*.　　Since *laugh* cannot take a goal argument in itself, the sentence *Mary laughed to the room* is judged to be ungrammatical.

2.1.3.　　The Need for Conditions on Directional Interpretations of Locative PPs

　　We have reviewed so far the two types of syntactic approach to directional interpretations of locative PPs.　　These approaches, however, seem to be problematic in some respects.

　　A problem with the null Path head analysis concerns the licensing condition on a null Path head, which allows a locative PP to be interpreted directionally.　　The researchers who employ the null Path head approach argue that it is a path meaning component of the verb that makes a null Path head available.　　However, they do not define what the path meaning component is.　　Even if the path meaning components of some manner-of-motion verbs are the same as those of result verbs like *go* and *come*, it leaves a further problem.　　The idea that some manner-of-motion verbs have both manner and path meaning components conflicts with a general constraint on the complexity of non-stative verb meanings.　　This constraint is called manner/result complementarity proposed by Rappaport Hovav and Levin (2010),

which is summarized as in (19):[4]

(19) Manner/Result Complementarity: Manner and result meaning components are in complementary distribution: a verb lexicalizes only one.

(Levin and Rappaport Hovav (2013:50))

The lexicalization constraint is supported by various kinds of linguistic data. A direct way to test a result state is to see if denying a result state gives rise to a contradiction. Canonical result verbs like *go* and *come* generate a contradiction with a continuation that denies a result state, but manner-of-motion verbs do not (e.g., #*John came (somewhere), but he didn't move anywhere.* vs. *John ran/jumped, but he didn't move anywhere.*). Although we need to take into account a lexical semantic difference between the *run* type and the *dance* type, the difference is not the presence or absence of a path (i.e. result) meaning component.

Kaga's (2007) analysis also suffers from two important problems. A first problem concerns the parameter of the availability of an empty verb. According to Kaga, verb-framed languages do not have the ability to use an empty verb. This suggests that in languages like Japanese and French, a locative expression used with a manner-of-motion verb is not interpreted as the goal of motion. However, this is not the case. Japanese and French do have attested examples of directional interpretations of locative expressions, as shown in (20).

(20) a.　Kooban-o　　　de-ta　　　hutari-wa　　　mugon-no-mama
　　　　Police-box-ACC　exit-PAST　the-two-TOP　in-silence
　　　　eki-ni　　aru-ita.
　　　　station-to　walk-PAST
　　　　'The two exiting the police box walked to the station in silence.'

(Y. Sou, *Incoherent Earth*, cited from Namiki (2014:104))

b.　Elle a　couru sous　le　pont　(afin de　se mettre à l'abris).
　　she has run　under the bridge　(in　order to find　shelter)
　　'She has run under the bridge.'

(Noonan (2010:176))

In Japanese the goal phrase NP-*ni* 'to NP' canonically co-occurs only with a result verb like *iku* 'go', *kuru* 'come', etc. However, the phrase *eki-ni* 'to the station' in (20a) is used with the manner-of-motion verb *aruku* 'walk'. Likewise, in French

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[4] Following Rappaport Hovav and Levin (2010) and Talmy (2000), we take path meaning components (i.e. path) as a subset of a result meaning component.

the PP *sous le pont* 'under the bridge' with the manner-of-motion verb *courir* 'run' in (20b) is interpreted as the goal of motion.[5]   The data in (20) demonstrates that there is a similarity of path coercion between satellite-framed and verb-framed languages.   While Kaga's (2007) parametric analysis deals with the cross-linguistic variation of strong resultatives, as well as "a hole" constructions and gesture-expressions constructions, it does not correctly predict the similarity between satellite-framed and verb-framed languages.

Second, the condition in (18) fails to capture the difference of acceptability between directional PPs and directionally interpreted locative PPs.   As is well known, directional PPs can be used with manner-of-motion verbs like *dance* or *wiggle*, whereas locative PPs interpreted directionally cannot, as illustrated in (21):

(21) a.   They danced {into/*in} the ballroom (from the outside).   (cf. (4))
b.   She wiggled {into/*in} the blanket (from the outside).

If an empty verb always allowed a manner-of-motion verb to take a PP as the goal argument, it would not give rise to the grammatical difference in the acceptability of the two types of spatial PP.   Thus, the condition in (18) needs more explanation to certain cases of directional interpretations of locative PPs.

By comparison of the two syntactic approaches, it could be expected that the null Path head approach is persuasive about locative PPs interpreted as the goal of motion, rather than the empty verb approach.   I will employ the null Path head approach and propose a semantic mechanism of path coercion which can resolve its problem: what is the semantic property of manner-of-motion verbs that allows *in* phrases to be interpreted as goals of motion?   Before entering into my proposal, it should be useful to review a semantic approach to directional interpretations of locative PPs.

2.2.   The Cognitive Approach to Directional Interpretations of Locative PPs
2.2.1.   The Result State of Motion Is Profiled Rather Than the Process of Motion

There is another type of approach to directional interpretations of locative PPs: the cognitive approach proposed by Nikitina (2008).   She explores directional interpretations of the locative P *in* in American English as opposed to the alternative strategy of denoting goals of motion by the directional P *into*.   Her main claim is

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[5] One might think that the acceptability of (20b) is attributed to the specialty of the verb *courir*, which is used to mean not only 'to run' but also 'to hurry'.   However, according to Noonan (2010:176), the locative PP *sous le pont* can be interpreted as the goal of motion when it co-occurs with French counterparts of *roll* and *jump*.

that directional *in* phrases are used only when the directional meaning can be inferred pragmatically, and that the pragmatic factors are reduced to how to conceptualize a complex event.

Nikitina (2008) argues that the choice between directional *in* phrases and *into* phrases is determined by which semantic element is profiled, the process of motion or a result state. Directional *in* phrases are used when the end point of a path along which an entity moves is profiled, whereas *into* phrases are used when the process of motion is profiled. Nikitina demonstrates this idea by showing three pieces of evidence. First, directional interpretations of *in* phrases are dispreferred when used with manner-of-motion verbs that denote highly specific manners of motion. This is exemplified in (22), cited from Nikitina (2008:185):[6]

(22) a. ?? He crawled in the room.
　　 b. ?? They danced in the ballroom.
　　 c. ?? They biked in the garage.
　　 d. ?? The man limped in the house.

Manner verbs specify a manner of carrying out an action as part of their meaning (Rappaport Hovav and Levin (2010), among others). Since carrying out an action corresponds to the process of the event, a manner modifies the process of an event. According to Nikitina, modifying the process of an event can be thought of as profiling the process. In motion events, the process corresponds to a path along which an entity moves. Thus, a manner-of-motion verb in a motion expression implies that the path of motion is profiled. This is incompatible with directional *in* phrases, which profile the result state of a spatial transition.

Second, Nikitina (2008) shows that directional *in* phrases are dispreferred when the path of motion is mentioned explicitly, as shown in (23):

(23) a. ?? John walked from the kitchen in the living room.
　　 b. ?? John walked through the corridor and in the kitchen.

(Nikitina (2008:185))

(23a) involves the *from* phrase which makes it possible to construe a path along which an figure moves. As is the case with the manner-of-motion verbs in (22), the function of *from* phrases as evoking the path of motion is incompatible with the function of directional *in* phrases as profiling a result state. Likewise, since the

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[6] Below, I use "??" to indicate that the *in* phrase is not interpreted as the goal of motion.

through phrase in (23b) profiles the route consisting of the path of motion, the *in* phrase is not interpreted as the goal of motion.

Finally, Nikitina (2008) points out that there is a restriction on the NPs functioning as the complement of directional *in* phrases.   Compare (24) and (25):

(24) a.   He walked in the {room/backyard/store}.
    b.   ?? He walked in the {city/field/mountain}.
(25) a.   Then we went in the {room/backyard/store}.
    b.   ?? Then he went in the {city/field/mountain}.

(Nikitina (2008:187-188))

Whereas the *in* phrases *in the room*, *in the backyard*, and *in the store* in (24a) and (25a) are ambiguous between a locative and a directional reading, *in the city*, *in the field*, and *in the mountain* in (24b) and (25b) are interpreted only as a location in which an action takes place.   As is clear from the comparison of (24) and (25), the acceptability of the directional interpretations of these *in* phrases is not relevant to meanings of verbs.   Nikitina ascribes the difference of the acceptability of directional *in* phrases in (24) and (25) to whether or not the path is profiled.   She assumes that the presence or absence of a prominent path of motion is determined by a relatively objective characteristic of location: the presence or absence of well-defined boundaries.   According to her, the places in (24a) and (25a) are referred to as "containers" with respect to the presence of well-defined boundaries. The locations in (24b) and (25b), on the other hand, are referred to as "areas" with respect to the absence of well-defined boundaries.   Nikitina notes that "[d]ue to the presence of a well-defined boundary, goals of this type ([she] refer[s] to them as "containers") allows for a possibility of a punctual transition that does not involve a prominent path" (Nikitina (2008:186)).

The claim of Nikitina's (2008) cognitive semantic approach can be summarized as follows: (I) Directional *in* phrases profile the result state of motion rather than the process of motion; and (II) directional *in* phrases are disfavored if (a) the verb has a highly specific manner meaning component, (b) the source phrase or path phrase occurs, or (c) the location denoted by the complement of *in* lacks a well-defined boundary.   These three factors, as opposed to the function of directional *in* phrases, conceptually focus on the process of motion.

2.2.2.   *The Need for a Closer Look at Data of Directional* In *Phrases*

The cognitive approach can capture the above conditions on directional *in* phrases.   Nevertheless, this approach is problematic in three important respects.

First, it is not clear why directional *in* phrases are incompatible with manner-of-motion verbs that denote highly specific manners of motion. Admittedly, manner-of-motion verbs like *crawl*, *dance*, *bike*, and *limp* denote more specific manners than, for example, *run* and *walk* do. However, *in* phrases can be interpreted directionally when present participles, such as *dancing*, or adverbs, such as *staggeringly*, specify the manner of motion, as shown in (26):

(26) a.　　Bill came in the classroom (by) dancing.

　　 b.　　Mary went in the office staggeringly.

In (26) the highly specific manners are encoded by not the verbs but the two modifiers. As seen in section 2.2.1, Nikitina argues that directional *in* phrases are incompatible with factors profiling the process of motion. If Nikitina's analysis were correct, the sentences in (26) would be unacceptable because the present participle and the adverb in (26) profile the process of motion. Thus, this fact is unpredictable in her framework.

　　Second, not all the verbs that denote highly specific manners of motion are incompatible with directional *in* phrases. Some attested examples are given in (27) (emphasis mine).[7]

(27) a.　　I was excited now to tell Sam and the others. I didn't even know if Embry or Quil noticed. I parked on the gravel and <u>jogged in the house</u>.

　　(http://klumsybellagirl.deviantart.com/art/Halley-Meets-Jacob-ch2-118260380)

　　 b.　　The house seemed so quiet, lonely as he <u>drove in the garage</u>.

　　　　　　(http://www.prose-n-poetry.com/display_work/2019)

The examples in (27) show that the directional interpretations of the *in* phrases are acceptable even when used with the manner-of-motion verbs *jog* and *drive*. As is clear from the definitions of these verbs in COBUILD[5], *jog* and *drive* denote more specific manners of motion than *run* and *walk* do: for example, the meaning of *jog* consists of the act of running plus the slowness of the action.

(28) a.　　*jog*: If you jog, you run slowly, often as a form of exercise.

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[7] Gehrke (2008) reports, however, that there is cross-speaker variation on the acceptability of directional interpretation of *in*. As Ramchand (2008) notes, it is likely that American English speakers tend to accept directional *in* more easily than British English speakers. Among my informants, all three Australian English speakers judge the sentences in (27) felicitous.

    b.   *drive*: When you drive somewhere, you operate a car or other vehicle and control its movement and direction.

    c.   *run*: When you run, you move more quickly than when you walk.

    d.   *walk*: When you walk, you move forward by putting one foot in front of the other in a regular way.

(COBUILD[5])

The data in (27) make it questionable whether Nikitina's analysis is valid for the restriction on verbs that license directional *in* phrases.

It should be noticed here that even manner-of-motion verbs like *run* and *walk* have manner meaning components. Since manners of motion modify the process of motion, *run* and *walk* do profile the process of motion, as is the case with *jog* or *drive*. The framework of Nikitina (2008) would not explain what makes the difference between manner-of-motion verbs like *run* and *walk*, on the one hand, and those like *jog* and *drive*, on the other hand.

Moreover, although Nikitina (2008) observes that directional *in* phrases are dispreferred with the verb *crawl*, there are cases where *in* phrases can be interpreted as goals of motion in the context of *crawl*. According to Tutton (2009), the *in* phrase in (29) is interpreted directionally in British English.

(29) [T]he slug was said to have crawled in the bottle before it was filled[.]

                (news.bbc.co.uk, cited from Tutton (2009:18))

Further evidence from the attested example in (30) confirms the acceptability of directional *in* phrases in the context of *crawl* (emphasis mine):

(30) He carried a towel when he came back out and saw that Alizabet had crawled from the bed and was sorting through her armoire. "Back to bed," he said. "We are not leaving this room today." […] When she didn't make a move, he walked toward her and wrapped one arm around her waist, directing her toward the bed. <u>She crawled in the bed.</u> "But what are we going to do?"   (Eliza Lloyd, *Wicked Secrets*)

As is obvious from the previous contexts, Alizabet was outside of the bed before she was encouraged to get in the bed, and then she got in the bed crawling. Therefore, we need take these attested data into consideration, and reexamine a semantic difference between manner-of-motion verbs that license directional *in* phrases and those that do not.

    Last, but not least, there are cases where the source phrase or path phrase is compatible with directional *in* phrases, as shown in (31):

(31) a.   John walked in the living room <u>from the kitchen</u>.
     b.   John walked in the kitchen <u>through the corridor</u>.
(32) a.   ?? John walked from the kitchen in the living room.   (= (23a))
     b.   ?? John walked through the corridor and in the kitchen.   (= (23b))

According to my informants, the opposite acceptability judgments between (31) and (23), repeated as (32), result from the syntactic alignment of the PPs.   The sentences in (31) would be unacceptable, if as Nikitina (2008) argues, their acceptability came from the explicit mention of the path of motion.   Alternatively, Thomas (2001) points out the adjacency of a directional *in* phrase with the verb. She observes that a directional interpretation of an *in* phrase is lost when the PP moves out of VP, or when syntactic constituents intervene between the verb and the PP.[8]

(33) a.   John ran in the house.
     b.   * John ran <u>at top speed</u> in the house.
(34) a.   He ran in the house.
     b.   * He ran <u>out of the barn and</u> in the house.
(35) a.   The orchestra ran in the concert.
     b.   * <u>In the concert hall</u> ran the orchestra.
                              (Thomas (2001:96-97), with slight modifications)
(36) * The pool in which John fell is extremely deep.   (Thomas (2001:98))
(37) * In this pool John fell.   (Thomas (2001:98))

The details of how the syntactic adjacency between an *in* phrase and a verb follows differ from theory to theory. However it is clear that the syntactic adjacency is crucial here for an *in* phrase to be interpreted as the goal of motion.   Aside from the account of the adjacency, this paper now focuses only on pointing to the insufficiency of Nikitina's analysis.[9]   The unacceptability of (30) is reduced not to the incompatibility of the function of directional *in* phrases and the meaning of the source phrase or path phrase, but to the syntactic adjacency between an *in* phrase

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[8] Nikitina (2008:182) also mentions this point, but she does not associate the acceptability of the sentences in (31) with the observation of (33) to (37) in Thomas (2001).
    [9] I will deal with the syntactic adjacency between directional *in* and a verb on the basis of a path coercion analysis in section 4.

and the verb.

Then, to account for conditions on directional interpretations of not only *in* phrases but also other locative PPs, we will mainly address the following question: what is the semantic property of manner-of-motion verbs that allows *in* phrases to be interpreted as goals of motion?

3. Proposal

We have reviewed so far the three previous approaches to directional interpretations of locative PPs, especially *in* phrases, and pointed out that these approaches share the same problem concerning manner-of-motion verbs. This section provides a proposal to reveal the mechanism of path coercions, which can resolve the problems with the previous studies.

To begin with, let us consider how a directed motion event is generally encoded. A directed motion event consists of, at least, a moving figure, motion, a manner in which the figure moves, and a path along which the figure moves (Talmy (2000) and Jackendoff (1983, 1990), among others). For example, in the sentence *Mary walked to the room*, the moving figure is encoded by *Mary*, the motion and manner are encoded by the verb *walk*, and the path is encoded by the directional PP *to the room*. This is illustrated in (38).

(38) Figure + Motion + Manner + Path
          ↓   ↓_____↓   ↓
   Mary   walk   to the room
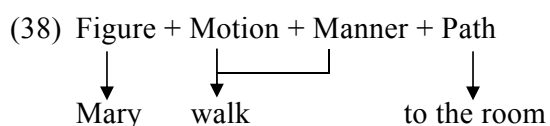
This encoding pattern should be true of sentences in which a locative PP is interpreted as the goal of motion. However, this seems to be problematic because in a sentence where a locative PP is interpreted as the goal of motion, no constituent lexicalizes a path meaning component.

Here, based on Jackendoff (1990) and Talmy (2000), I assume that the notion of path can be decomposed into two notions: a route (or vector as a term of Talmy (2000)) along which an entity moves, and a place at which the motion ends (i.e. goal). On the basis of this decomposition, the schema of directed motion event in (38) is refined as in (39):
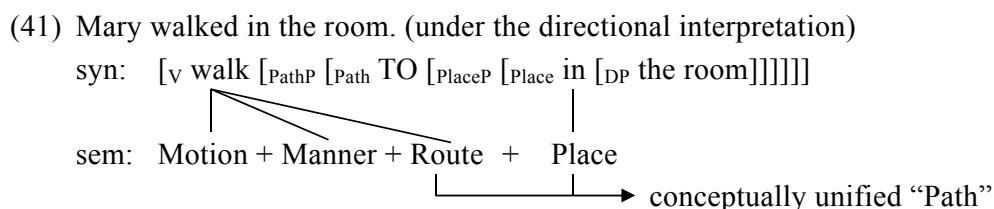
(39) Figure + Motion + Manner + Route + Place
          ↓   ↓_____↓   ↓_____↓
        Mary   walk   to the room
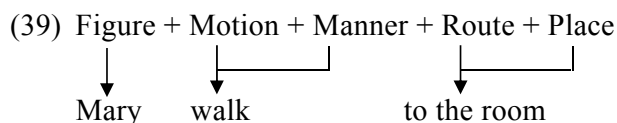
In this assumption, each meaning component in *Mary walked in the room* under the directional interpretation is encoded as follows:

(40) Figure + Motion + Manner + Route + Place

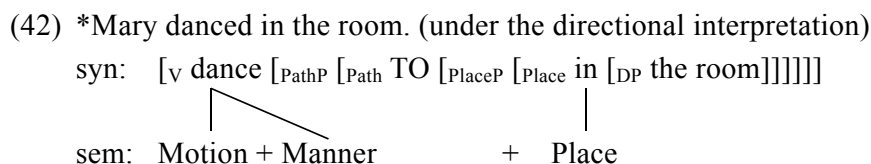   Mary   walk   in the room
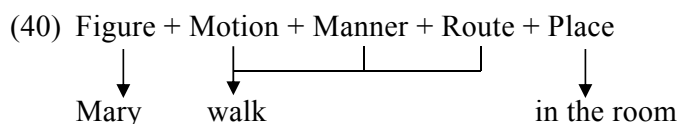
In (40) the motion, manner, and route are encoded by the verb *walk*, and the place is encoded by the locative PP *in the room*.

It should be noticed here that a place in itself is interpreted as a goal of motion. Since the notion of goal is a subset of place, these meaning components are not identical. A place can be conceptualized as a goal of motion when an entity is to move toward the place. Thus, a place meaning component needs a route meaning component to shift its meaning to a goal. We assume that when a locative PP is interpreted as the goal of motion, a route meaning component encoded by the verb is conceptually unified with a place meaning component encoded by the locative PP to be conceived of as a path meaning component as a whole.

Under the proposal to the mechanism of path coercions, the directional interpretation of a locative PP is explained in the following way. Consider (41):

(41) Mary walked in the room. (under the directional interpretation)

      syn: [$_V$ walk [$_{PathP}$ [$_{Path}$ TO [$_{PlaceP}$ [$_{Place}$ in [$_{DP}$ the room]]]]]]

      sem: Motion + Manner + Route + Place

                                          conceptually unified "Path"

In (41), a phonologically null Path head TO is merged with the PlaceP. When we read off the sentence, we need to take into consideration meaning components encoded by each element. Since the sentence has all meaning components of a motion event, we may unify a route meaning component with a place meaning component to generate a path meaning component, which allows the locative PP to be interpreted as the goal of motion.

(42) *Mary danced in the room. (under the directional interpretation)

      syn: [$_V$ dance [$_{PathP}$ [$_{Path}$ TO [$_{PlaceP}$ [$_{Place}$ in [$_{DP}$ the room]]]]]]

      sem: Motion + Manner   + Place

In contrast, *in the room* in (42) is interpreted as only a location of the event. Even if the sentence is built up in the same way as (41), a path coercion does not work because of the lack of a route meaning component.

To sum up, I claim that path is decomposed into route and place, and that in the sentence including a locative PP interpreted as the goal of motion, the verb encodes a route meaning component and the locative PP encodes a place meaning component. Since these two meaning components are conceptually unified, we can semantically coerce the locative PP to express the goal of motion.

4. Supporting Evidence

4.1. Route Meaning Components

As seen so far, manner-of-motion verbs are classified into two types in terms of the acceptability of directional *in* phrases.

(43) a. John ran in the kitchen.
    b. Mary walked in the room.
    c. I parked on the gravel and jogged in the house.
    d. She crawled in the bed.
(44) a. * They danced in the ballroom.
    b. * Nora {wandered/roved/wobbled} in the park.

We have proposed in the previous section another type of encoding pattern of directed motion events, where a manner-of-motion verb encodes a route meaning component. In other words, the lexical semantic difference between the verbs in (43) and those in (44) is reduced to the presence or absence of a route meaning component.

This is borne out by three pieces of linguistic evidence. First, the manner-of-motion verbs in (43) can take as a complement a DP denoting a route along which an entity moves in a certain manner. Such DPs include *the street* (*to the station*), for example.

(45) a. Mary {walked/ran/jogged/crawled} the street to the station.
    b. * Mary {wandered/roved/wobble/danced} the street to the station.

The grammatical difference in (45) is predictable on our proposal that the verbs in (45a), but not those in (45b), have a route meaning component.

Second, as Zubizarreta and Oh (2007) point out, manner-of-motion verbs that allow locative PPs to be interpreted as the goal of motion can take a generic

classifier that measures distance or interval, which they refer to as the distance classifier. Compare (46a) with (46b).

(46) a. John {ran/walked/swam/galloped} {a certain distance/a mile}.
　　b. * John {wandered/roved/wobbled} {a certain distance/a mile}.

(Zubizarreta and Oh (2007:131))

We can also find that *crawl* does take the NP *X mile* as a complement. An example is given in (47) (emphasis mine).

(47) We kept crawling and crawling and crawling, and then we crawled some more. Even though it felt like <u>we crawled a mile</u>, I knew we had really only crawled for about 20 feet. (C. McCarthy, *Wave of Destruction*)

This distance classifier is thought of as an abstract path. Thus, the grammatical difference of (46) and the fact of (47) are also predictable if manner-of-motion verbs differ in the presence or absence of a route meaning component.

Third, the manner-of-motion verbs in (43) can co-occur with delimiter phrases like *until* phrases, whereas those in (44) cannot. Compare (48a) with (48b).

(48) a. John {ran/walked/jogged/crawled} until the station
　　b. * John {wandered/roved/wobbled/danced} until the station.

Delimiter phrases are used to express general delimitation, providing a static boundary point for some event participant that has physical or abstract extent (Beavers (2008)). When a motion predicate takes a delimiter phrase with a place as its complement, the inference is that the complement measures the endpoint of the route of motion. Given this function of a delimiter phrase in a motion expression, we can attribute the grammatical difference of (48) to the presence or absence of a route meaning component: until phrases expressing the endpoint of the route of motion is incompatible with the manner-of-motion verbs in (48b) because they lack of a route meaning component.

To recapitulate, we have proposed that the manner-of-motion verbs that allow locative PPs to be interpreted as the goal of motion have a route meaning component, which is borne out by the three pieces of evidence: the co-occurrences of them with a route DP, a distance classifier, and a delimiter phrase. Our proposal can also account for the data in (26), repeated as (49), that Nikitina (2008) fails to explain.

(49) a. Bill came in the classroom (by) dancing. (= (26a))

   b. Mary went in the office staggeringly. (= (26b))

Unlike the prepositional phrase headed by *in* of *Bill danced in the classroom* for example, the *in the classroom* in (49a) is interpreted as the goal of motion. This fact does not follow from Nikitina's (2008) claim that a highly specific manner is incompatible with an *in* phrase interpreted as the goal of motion. Our proposal, however, can predict the data like (49) because the result verbs *come* and *go* have a path meaning component.

4.2. *Conceptually Unified Paths*

   Another important part of our proposal is that a place meaning component is conceptually unified with a route meaning component to be interpreted as a goal of motion. It can be predicted that if the two meaning components are conceptually unified, the their syntactic elements can also "unified" to form a complex predicate. This is supported by the fact in section 2.2.2, as exemplified in (50) and (51):

(50) a. John ran in the house.

   b. * John ran <u>at top speed</u> in the house.

(51) a. He ran in the house.

   b. * He ran <u>out of the barn and</u> in the house.

The data in (50) and (51) clearly show that the verb and the locative PP are unified: when a locative PP is interpreted as the goal of motion, the PP must appear in the verbal complement position, and stay VP internally and adjacent to the verb.[10]

4.3. *Path Coercions on Other Locative PPs*

   We have mainly treated so far directional interpretations of *in* phrases. This section shows that our proposal to path coercion also applies to directional interpretations of other locative PPs like *on* and *under* phrases. To be more precise, we take a closer look at conditions on directional interpretations of the two locative PPs with respect to types of verb and the syntactic adjacency between the PP and the verb.

   As is well known, *on* and *under* phrases in motion expressions can be ambiguous between a locative and a directional interpretation. This is illustrated in

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[10] For the present, we simply provide (50) and (51) as a piece of evidence for the proposal of the conceptually unified path. We leave open the problem of the syntactic structures of (50) and (51).

(52) and (53).

(52) Kim jumped on the bed.   (Beavers et al. (2010:363))
    a.   Kim jumped while being on the bed.
    b.   Kim jumped and (as a result) he ended up on the bed.
(53) The rat ran under the table.   (= (3))
    a.   The rat ran while being under the table.
    b.   The rat ran and (as a result) it ended up under the table.

As is the case with directional interpretations of *in* phrases, *on* phrases and *under* phrases cannot be interpreted as the goal of motion when the verb does not have a route meaning component (Bouchard (1995), Milway (2015)).   This is exemplified in (54) and (55).

(54) a. * A famous singer danced on the stage.
     b. * I wandered on a frozen river.
(55) a. * A gentleman and lady {danced/waltzed} under the chandelier.
     b. * A drunk {wandered/roved} under the bridge.

As shown in (55), *under* is not lexically ambiguous between a locative and a directional interpretation, although, unlike *in* and *on*, it lacks the morphological alternative (e.g. **underto*).   Additionally, the syntactic adjacency between the locative PP and the verb is also true for the cases of directional interpretations of *on* and *under* phrases:

(56) a. * A baby went from the kitchen under the table.
     b. * Under the table, a cat ran.
(57) a. * Bill ran at top speed on the beach.
     b. * On the beach, Bill ran.

From the observation of directional interpretations of *on* and *under* phrases, it can be safely said that our proposal to the mechanism of path coercions can apply to directional interpretations of other locative PPs like *on* and *under* phrases.

5.   A Consequence

    It is said that in addition to syntactic adjacency, verb meaning, and the type of location that the NP refers to, contexts play an important role in licensing directional interpretations of the locative PPs (Levin et al. (2009)).   The locative PP headed by

in used with a manner-of-motion verb is unambiguous when uttered out of blue: the PP is interpreted only as locational.   This is illustrated in (58).

(58) [Discourse initial] Mary walked in the room.
    a.   Mary walked while being inside the room.
    b. ?? Mary walked and (as a result) she ended up in the room.

Levin et al. (2009) argues that contexts need to indicate the situation in which an entity travels a short distance to the goal, which is attributed to Nikitina's (2008) proposal that a directional *in* phrase profiles only the result state.

(59) a.   [Standing just outside of the room]
           John walked in the room.
    b.   [Standing down the hallway from the room]
      ?? John walked in the room.

They explain that (59b) is unacceptable because of the explicit mention of a long distance from the source of motion to the goal.

    Their explanation, however, is not tenable.   In fact, there are a number of attested examples in which contexts do not imply that the distance of a transition is short.   Consider the following example:

(60) He [Joey] gasps and loses his balance and grabs on to one of the gurneys. At that moment, Al lets him sit down on the chair in the waiting room, and they talk.   The first thing Joey says is, "Can I see her?   I mean, where is she?"   "Down this way.   She was in critical care last night.   Today, she is moved to her own room because she's more stable now."   <u>As he walks in the room, he sees her lying in front of him on the bed</u>, […]
  (J. Mahmough, *Be That As It May*: *Don't Worry about Thing You Can't Change*)

We can construe that is the goal of the transition *her own room* is not so far away from the source *the waiting room* because the scene of the story is inside a hospital. The *in* phrase in (60), however, is interpreted as the goal of motion, although the contexts in (60) involve no expression that they are located near each other.

    Alternatively, I argue that contexts serve just as resolving the ambiguity between a locative and a directional interpretation.   Recall the Structural Ambiguity Hypothesis, as repeated in (61):

    (61) The Structural Ambiguity Hypothesis: The spatial Ps *in*, *on*, *under*, and *behind* are locative only.   Any ambiguity between a directional and a locative reading is structural and not lexical.   (= (6))

Although the locative interpretation of the PP in (58) is preferable to the directional interpretation, (58) is ambiguous between locative or directional.   A context is used to exclude the semantic ambiguity of a locative PP.   Based on the preference of the interpretation of locative PPs, we can predict that the locative PP can be interpreted directionally if the context excludes the possibility of the locative interpretation of the PP.   In fact, in the example in (60) the previous contexts explicitly indicate that Al and Joe are not inside her room.   Thus, the directional interpretation of a locative PP is sensitive to the context that implicates as the goal of motion the place referred to by the locative PP, not the context that evokes a short distance of the movement.

      If so, why is the sentence underlined judged to be natural?   A possible answer to this question is that the unacceptability of (59b) is attributed to the aspectual property of the sentence.   As Denis et al. (2003) point out, locative PPs under the directional interpretation give rise to achievement predicates.   It is generally said that achievement predicates express punctual events.   Given this, we can predict that an achievement predicate expressing a directed motion event is incompatible with a context like (59), and this is true.

    (62) [Standing down the hallway from the room]
        #John appeared to me in the room.

This fact clearly shows that even a canonical achievement predicate is incompatible with the context evoking a long distance to the goal of motion.   Thus, the unacceptability of (59b) can be attributed to a general characteristic of achievement predicates.

7. Conclusion

      On the basis of the decomposition of the conception of path into route and place, this paper has proposed a new encoding pattern of directed motion events. When the locative PP is interpreted as the goal of motion, the verb encodes a route meaning component and the locative PP encodes a place meaning component.   For a place to be a goal, these meaning components need to be conceptually unified.   It is the syntactic adjacency relationship between the verb and the locative PP that the conceptual unification of the two meaning components gives rise to.

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