ON A CERTAIN TEMPORAL USE OF INTO: A CONCEPTUAL SEMANTIC ANALYSIS

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1. Introduction

This paper primarily focuses on the temporal use of into, exemplified by They talked well into the night. This sentence indicates that the event, described by the verb, continued up to a certain point during the period, which is denoted by the object of into. The example thus means that they continued talking until late at night. We will refer to the expression into the night as the durative into.1

Unlike its spatial use, the durative into has not received much attention in the previous literature. Quirk et al. (1985) and Huddleston and Pullum (2002), two major modern grammars of English, offer examples; however, neither provide a detailed description nor make an analysis of the expression.2

The goal of this paper is twofold. First, we describe the semantic

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1 There is another type of the temporal into, exemplified by The accident happened three weeks into the vacation (Huddleston and Pullum (2002: 696)). The underlined PP is construed as specifying the location of an event in time rather than duration. It is interesting to consider how the into in question is related to the durative into. For lack of space, we want to leave the question for future research.

2 Taylor (1993) presents an analysis of the durative into in the framework of cognitive linguistics, which is sketchy, almost limited to the observation that it denotes a resultative meaning.
properties of the durative *into* in comparison with durative adverbials such as *until midnight.* Two facts are obtained: (i) the durative *into*, similar to *until*, imposes a temporary boundary on unbounded situations and (ii) produces the syntactically unexpressed sense of repetition when combined with durative adverbials. Second, we provide an account of (i) and (ii) within the framework of the Conceptual Semantics developed by Jackendoff (1991). Specifically, we show that these phenomena can be accounted for by analyzing the durative *into* as a function that maps unbounded situations into bounded ones in conceptual structure.

2. Semantic Properties of the Durative *Into*

2.1. Bounding of the Durative *Into*

As observed by Jackendoff (1991: 17) and many others, *until* places a temporal boundary on unbounded situations such as processes and states. To see this, consider the contrast in (1), noted by Gruber (1967: 946). In (1a), *the bird flew {about/toward the tree}* expresses an atelic process, and adding *until 5 o’clock* makes the process bounded. In (1b), by contrast, *the bird flew to the tree* is a telic event. Since the event is already bounded, it cannot be further bounded by *until.* Similarly, *arrive* and *notice* in (2) express a telic event, to which the bounding imposed by *until* cannot apply ((2a) and (2b) are taken from Quirk et al. (1985: 690) and Huddleston and Pullum (2002: 706), respectively).

(1)  

- a. The bird flew {about/toward the tree} *until 5 o’clock.*  
- b. *The bird flew to the tree *until 5 o’clock.*

(2)  

- a. *My girlfriend arrived there *until Christmas.*  
- b. *I noticed my error *until later.*

We consider the contrast in (3), keeping in mind the fact that *until* only bounds unbounded situations.

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3 Throughout this paper we follow Smith’s (1991) classification of temporal adverbials into four types; locating adverbials (at noon), durative adverbials (for an hour), completive adverbials (in an hour), and frequency adverbials (often).

4 There is a divergence among scholars as to whether boundedness and telicity should be distinguished (cf. Depraetere (1995)). Following Kearns (2011: 166), we will use the term *telicity* for a natural finishing point expressed by a verb and its argument(s) (e.g., *drive to Tokyo* is telic), and the term *boundedness* for “the more general property of having an endpoint expressed by any means, contrasted with unboundedness.” Telicity is viewed as a particular kind of boundedness.
(3) a. They drove around Tokyo into the night.
   b. *They drove to Tokyo into the night.
(4) a. *The man {arrived/died} into the night at the hospital.
   b. *The man {spotted a hawk/noticed his error} into the night.

In (3a) they drove around Tokyo is interpreted as atelic; it can therefore be bounded by into the night. In (3b), however, they drove to Tokyo is construed as telic; the event fails to be bounded by the durative into because it is already bounded. (4a, b) can be accounted for in the same way.

The above discussion implies that the durative into only applies to unbounded situations, parallel to until. Instances attested in corpora also support this point. Verbs that are found with the durative into in corpora are classified into two types according to the semantic types of verbs: those denoting a continuity (be, carry on, continue, go on, keep, last, sit, and stay), and those designating an activity (argue, chat, dance, ride, sing, speak, study, talk, and work). Examples are given in (5) below.

(5) a. The whole country, black and white, sang and danced into the night,… (BNC)
   b. “Burgos,” she maintained, and they argued into the night. (WB)

The aforementioned verbs are aspectually unbounded, indicating that the durative into only co-occurs with unbounded situations.

One might argue, however, that the following are counterexamples to that conclusion.

(6) a. I didn’t notice my error until later.
   b. I didn’t notice my error well into the night.5

In these examples, until and the durative into occur with bounded events that are negated. Huddleston and Pullum (2002: 706) write, however, that until later in (6a) “gives the duration of my not noticing my error.” I didn’t notice my error can be interpreted as an unbounded state, implying how long this negative state of affairs lasted. Likewise, in (6b) well into the night bounds the state of my not noticing my error. Thus, (6a, b) reinforce rather than weaken the claim that the durative into bounds unbounded situations.

Illustrating another piece of evidence for the bounded nature of the durative into, we consider an expression of the kind from … until (e.g., He did housework from 9 until 12). Here from and until specify the start and end-

5 One informant said that (6b) would be natural if well into the night is prefaced by until.
point in time, respectively. The sentence has an interpretation in which his doing housework started at nine o’clock and stopped at twelve o’clock. If the durative into has a bounding effect as we argued above, it should be combined with the source phrase to express an endpoint of duration. This is borne out by (7a, b).

(7) a. Yet she continues to work in the garden from the early morning well into the afternoon. (COCA)
   b. Appointments run at half-hour intervals from the early morning well into the night,… (Stephen King, the Green Mile)

In each of the examples, the durative into expresses an endpoint of the duration that started in the early morning. Thus, (7a) has a reading in which she started working in the early morning and stopped late in the afternoon, while a similar situation holds for (7b), with the endpoint being the night.

2.2. Repetitive Interpretation

Jackendoff (2002: 391) points out that the combination of a bounded situation and a durative adverbial creates the sense of repetition. In Sue slept all night, all night changes the process of sleep into a bounded event. Adding an until-clause, as in Sue slept all night until she started drinking too much coffee, does not extend this bounded event over the period but describes a repetition of the event of Sue’s sleeping all night. In other words, all night specifies the duration of Sue’s sleeping, while the until-clause specifies the duration of repetition of Sue’s sleeping all night.

Similarly, adding durative adverbials to sentences involving the durative into gives rise to the interpretation of repetition.

(8) a. John worked well into the night until Christmas.
   b. John worked well into the night for two weeks.
   c. *John worked well into the night in a couple of weeks.6

In (8a) well into the night imposes a boundary on the process of John’s working. However, adding until Christmas does not result in an anomalous sentence but a repetitive interpretation of the sentence; the event of John’s working until late at night occurred repeatedly. A similar interpretation obtains in (8b) as well. The sense of repetition, however, is not available

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6 The asterisk is meant to indicate that (8c) is unacceptable on the reading that the event of John’s working until late at night occurred repeatedly for a couple of weeks. This sentence could also be read as expressing initiation of the event described by the verb work (‘John began to work well into the night in a couple of weeks’). For the present purposes we exclude such readings.
with a completive adverbial, as in (8c).

To sum up, the observations made so far have revealed two properties of the durative into, which call for an explanation.

(9) (i) Changing the aspect of a sentence from unbounded to bounded.
(ii) Creating a sense of repetition when combined with a durative adverbial.

Our next task is to provide an account of (9i, ii). As a prerequisite for our explanation, we sketch out certain basics of Jackendoff’s (1991) Conceptual Semantics, on which our explanation is based.

3. A Conceptual Semantic Analysis

3.1. Theoretical Framework

In terms of a more fundamental set of primitive features, Jackendoff (1991) decomposes certain conceptual categories that were treated as primitives in Jackendoff (1983). We look briefly at three features: [direction] ([DIR]), [±boundedness] ([±b]), and [±internal structure] ([±i]).

First, [DIR] offers a unification of conceptual categories treated as separately existing. Places and Paths fall under a supercategory called Space. Places (e.g. at the park) are those Spaces that are zero-dimensional and have no direction ([Space [−DIR]]). By contrast, Paths (e.g. to the park) are those Spaces that are one-dimensional and have a direction ([Space [DIM 1d DIR]]). [DIR] also distinguishes between States and Events. States have no inherent temporal structure; events have an inherent temporal structure, which proceeds in a definite direction. The two are combined into a supercategory called Situation (Sit), with States as the undirected Situation ([Sit [−DIR]]) and Events as the directed Situation ([Sit [DIR]])..

[±b] distinguishes between count nouns and mass nouns. Count nouns such as bicycle are conceptualized as units: if we divide a bicycle by dismantling it, we do not obtain further instances of the basic unit. Moreover, we cannot recognize each of its parts as a bicycle. Nor can we divide the event The light flashed or recognize smaller events as The light flashed. Mass nouns such as sand, by contrast, can be divided into further instances of themselves; if we divide sand into smaller grains, each of those grains is discernible as sand. We can also divide the process Bill slept into smaller parts describable as Bill slept. Count nouns and events are [+b]; mass nouns and processes are [−b].

Bare plurals comprise a multiplicity of distinguishable individual units,
ON A CERTAIN TEMPORAL USE OF INTO

whereas single count nouns do not have such entailment. \([±i]\) distinguishes the two: plurals are \([\text{Mat} −b, +i]\), whereas single count nouns are \([\text{Mat} +b, −i]\). This also distinguishes iterative events from single events. For example, \textit{the light flashed continually} is normally conceptualized as unbounded iterations of flashing \([\text{Sit} −b, +i]\), while \textit{the light flashed} is interpreted as a single bounded event of flashing \([\text{Sit} +b, −i]\).

Apart from the features just introduced, Jackendoff proposes six functions that map one combination of the features \([b]\) and \([i]\) into another. We present PL (PLURAL) and COMP (COMPOSED OF). First, PL is a function that maps a bounded entity into an unbounded multiplicity of entities of the same type. For example, \textit{birds} has (10) as its conceptual structure.

\[
\begin{align*}
\text{PL} & \left[\begin{array}{c}
\text{Mat} \\
−b, +i
\end{array}\right] \\
& \left[\begin{array}{c}
+b, −i \\
\text{Mat} \\
\text{BIRD}
\end{array}\right]
\end{align*}
\]

Here PL changes the \([+b, −i]\) specification of \textit{bird} into \([−b, +i]\), from which the plurality of birds is read off. Another function of COMP changes the feature specification of an argument from \([−b]\) to \([+b]\). Jackendoff treats \textit{until} as the COMP of two arguments: Situation and Time (or Situation).\(^8\) On the basis of this, for example, the conceptual structure of \textit{we talked until midnight} can be shown as in (11).

\[
\begin{align*}
\text{COMP} & \left[\begin{array}{c}
\text{Sit} \\
−b
\end{array}\right] \\
& \left[\begin{array}{c}
\text{BDBY}^+ \\
\text{Time} \\
\text{MIDNIGHT}
\end{array}\right]
\end{align*}
\]

Here COMP bounds the \([−b]\) Situation (WE TALK) with the Time (MIDNIGHT), producing a \([+b]\) Situation. This makes explicit the sense that the process of our talking stopped at midnight.

The theoretical machinery just given leads to a much more highly structured system of semantic primitives than the one developed in Jackendoff (1983), and gives the foundation on which we account for (9i, ii).

\(^7\) \textit{Mat} is an abbreviation of \textit{Material Entity}, which is a supercategory that contains individuals (\textit{a pig}), groups (\textit{a committee}), substances (\textit{water}), and aggregates (\textit{buses}) (Jackendoff (1991: 20)).

\(^8\) Situation also serves as the second argument of \textit{until} because \textit{until} takes a clausal argument as in \textit{He read until the guest arrived}. 
3.2. Account of the Properties of the Durative *Into*

Let us start by considering the following sentences ((12a, b) are adapted from COCA)).

(12) a. *For the rest of that day and into the night*, I stayed in the emergency room,…

   b. *All morning and into the afternoon* he sat in a cafe and read.

In each of the sentences the durative *into* can be coordinated with an adverbial designating a duration. Given that phrases can be coordinated if they are of the same semantic class (Quirk et al. (1985: 969)), it follows that the durative *into* designates a duration, parallel to durative adverbials. This is also evident from the fact that the durative *into* can be used as an answer ((13b)) to a *how-long* question ((13a)).

(13) a. *How long* did you work in the office last night?

   b. I worked there *well into the night*.

These observations indicate the need to group the durative *into* as one of the durative adverbials. De Swart (1998: 357) treats durative adverbials as “aspectual operators mapping sets of eventualities onto sets of eventualities.” Extending this idea to the durative *into*, we assume that the durative *into* is a function that bounds the duration of Situation with Time. In other words, the durative *into* is the COMP function of two arguments: Situation and Time. While it appears implausible to regard Situation as an argument of the durative *into*, this is supported from the fact, observed in section 2.1, that it places a selectional restriction on the verbs co-occurring with it, namely that the verbs in question must denote unbounded situations. Moreover, there is a semantic restriction on the nouns of the durative *into*; it will work with the nouns denoting a period of time, but not those indicating a point of time, as in *They talked into {the evening/*midnight/*noon/*that moment}*. This restriction is not shared by *until* as in *They talked until {the evening/midnight/noon/that moment}*). This difference indicates that Time of the durative *into* must designate a duration, whereas that of *until* does not necessarily have to. Duration is seen as the length of time that a situation lasts; it has to be one-dimensional (Jackendoff (1991: 30)). Hence, we

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9 While the durative *into* can readily be preposed, the spatial *into* denoting a goal cannot:

(i) a. *Late into the morning*, she had not heard a rustle. (COCA)

   b. *Into the brush, the bird flew in the yard.* (Gruber (1976: 71))

On the assumption that argument PPs cannot be preposed while adverbial PPs can, it follows that the durative *into* is an adverbial taking scope over a sentence rather than an argument licensed by a preceding verb in a sentence.
specify [DIM 1d] for Time of the durative into. In consideration of this, the conceptual structure of the durative into can be seen as in (14).\(^{10}\)

\[
(14) \quad X \text{ into}_{\text{temp}} Y^{11, 12}
\]

In (14) COMP acts as a function over the \([-b]\) Situation (X) to produce the \([+b]\) Situation, so accounting for the bounding effect of the durative into. In addition, (14) is responsible for why the durative into cannot co-occur with bounded events (see (3)). In (14) X must be \([-b]\) to be the argument of COMP. This prevents a \([+b]\) Situation from occupying X. This requirement is not an ad-hoc stipulation; it is independently needed for the explanation of examples such as until and a flock of birds (Jackendoff 1991: 23–25).

Let us turn to the account of (9ii). The relevant example is (8a-c), repeated here as (15a-c) for ease of reference.

\[
(15) \quad \begin{align*}
\text{a. } & \text{John worked well into the night until Christmas.} \\
\text{b. } & \text{John worked well into the night for two weeks.} \\
\text{c. } & \text{*John worked well into the night in a couple of weeks.}
\end{align*}
\]

(15a, b) have no lexical item that contributes to repetition. The situation described by John worked well into the night does not indicate repetition

\(^{10}\) In (14) the \([-i]\) feature of Situation is not expressed because it is irrelevant to the point at hand.

\(^{11}\) An anonymous reviewer points out that unlike until, a sentence involving the durative into (e.g., They talked well into the night) implies that the subject “entered” the midst of the period denoted by the object of into. (14) does not express this meaning explicitly, however. Resolving this problem takes us deeply into the theory of Conceptual Semantics, a topic beyond the scope of a brief paper.

\(^{12}\) An anonymous reviewer notes that (14) diverges from Jackendoff’s (1991: 13) conceptual structure of the spatial into denoting a goal:

\[
(i) \quad [\text{path} \text{ TO ([\text{Place} \text{ IN ([\text{Thing} ]])}]})
\]

In (i) into is treated as a composite of the Path-function TO and the Place-function IN; in (14) into is seen as a simplex preposition, or the COMP function of Situation and Time. One reason that we do not extend (i) to the durative into is that (i) does not conform to native speakers’ intuition. Aboh (2010: 253) reports that all of the native English speakers he has consulted feel that “… in naturally precedes to in the complex form into...”. In consideration of this, we will refrain from counting into as a composite of TO and IN.
but a bounded event. Neither *until Christmas* nor *for two weeks* expresses repetition; these normally extend the process over the period. Hence, the sense of repetition cannot be localized in any of the words in the sentences. Where does the sense of repetition come from?

The answer to the question can be sought in the notion of enriched composition, which Jackendoff (1997: 52–53) formulates as follows.

(16) … X does not serve as a suitable argument for F. Hence the process of composition interpolates a “coercing function” G to create instead the structure F(G(X)), where X is a suitable argument for G, and G(X) is a suitable argument for F.

The idea behind (16) is that when the combination of F and X creates a semantic ill-formedness, G is inserted between the two to ensure semantic well-formedness. The insertion of G is dependent upon linguistic context and world knowledge. Given this, we can describe the sense of repetition as involving a semantic composition that interpolates PL between the two [+b] Situations. In (17), the [+b] Situation (*John worked well into the night*) would not serve as a suitable argument for *until* because Situation of *until* must be [−b]. This triggers an insertion of PL to coerce the [+b] Situation into the [−b] Situation, resulting in the sense of repetition of John’s working late. In (15c), on the other hand, the [+b] Situation is a suitable argument for *in a couple of weeks*. Recall that in-adverbials can co-occur with bounded events. This keeps the PL from being inserted in the course of semantic composition; thus (15c) does not yield a repetitive interpretation.13

(17) *John worked well into the night until Christmas* =

\[
\begin{align*}
\text{COMP} & \left( \begin{array}{c} \text{PL} \\
\text{Sit} \end{array} \right) \\
\text{COMP} & \left( \begin{array}{c} \text{JOHN WORK} \\
\text{Sit} \end{array} \right) \\
\text{BDBY}^\prime & \left( \begin{array}{c} \text{NIGHT} \\
\text{Time} \end{array} \right) \\
\text{Sit} & \text{BDBY}^\prime \left( \begin{array}{c} \text{Xmas} \\
\text{Time} \end{array} \right)
\end{align*}
\]

The question remains of how to capture the sense of repetition in (15b). To answer this, it is necessary to consider the conceptual structure

13 This explanation captures the unavailability of a repetitive reading; however, it does not exclude the possibility of (15c) being acceptable on an inceptive reading (see fn. 6).
ON A CERTAIN TEMPORAL USE OF INTO 353

of a for-adverbial. While several analyses of the adverbial have been proposed in the literature, we follow the measure function analysis of De Swart (1998). This analysis relies on the basic intuition that durative adverbials measure the amount of unbounded situations. For example, for an hour in John walked for an hour would be analyzed as asserting that the duration of the situation in which John walked is the amount of time (one hour). De Swart (1998: 356) motivates the analysis with a progressive entailment test such as in (18). Sentences with atelic predicates in the progressive entail the truth of the sentences with verbs in the simple past form ((18a)), while sentences with telic predicates do not license such an inference ((18b)).

(18) a. Andrew was swimming. \(\rightarrow\) Andrew swam.
   b. Eve was drawing a circle. \(\not\rightarrow\) Eve drew a circle.
   c. Andrew was swimming for three hours. \(\not\rightarrow\) Andrew swam for three hours.

The sentence with a for-adverbial in (18c) patterns with the bounded sentence (18b) rather than with the unbounded one (18a), indicating that for-adverbials change situations from unbounded to bounded. Thus, the for-adverbial is analyzed as a function that maps unbounded situations onto bounded ones.

Applying this to Jackendoff’s (1991) framework, we assume that the for-adverbial is the COMP function of two arguments: Situation and Amount. As is well-known, for-adverbials only combine with unbounded situations as in (19). This means that the Situation of a for-adverbial must be \([-b]\).

(19) a. Susan lived in Paris for three hours.
   b. Andrew swam for three hours.
   c. *Eve drew a circle for three hours. (De Swart (1998: 356))

Apart from this, the for-adverbial differs from the durative into in two respects. First, as noted by Vlach (1993: 251), for-adverbials are used with temporal measure nouns but not with most ordinary temporal nouns (e.g. for June/1998). This is why for-adverbials select Amount rather than Time. Second, Dirven and Radden (2007: 324) state that for-adverbials denote a static rather than directional duration. In consideration of this, we specify \([-\text{DIR}]\) for the adverbials. Putting these points together yields the

\footnote{Here we exclude another usage of for in John rented a room for Thursday. As Vlach (1993: 251, fn.13) writes, for Thursday “does not apply to the event reported by the sentence, but instead specifies the period for which the room is to be occupied.”}
conceptual structure (20) for a for-adverbial.

(20) \( X \text{ for}_{\text{temp}} Y = \)

\[
\begin{align*}
&\begin{cases}
+ b & \text{[-DIR]} \\
\text{COMP} & \\
\text{Sit} & \text{BDBY}^+ (\text{[Amount } Y \text{]})
\end{cases} \\
&\begin{cases}
- b & \\
\text{X} & \\
\text{Sit} & \end{cases}
\end{align*}
\]

The application of COMP to the \([-b]\) Situation results in the \([+b]\) Situation; hence the bounding effect.

Let us move to the account of (15b). The \([+b]\) Situation (John worked well into the night) does not satisfy the selectional restriction of for-adverbials (see (20)). This triggers an insertion of PL between the two \([+b]\) Situations, as in (21). PL maps the \([+b]\) Situation of John working into the night onto the \([-b]\) Situation, on which for two weeks imposes a boundary to produce a bounded situation.\(^{15}\)

(21) \( \text{John worked well into the night for two weeks} = \)

\[
\begin{align*}
&\begin{cases}
+ b & \\
\text{COMP} & \\
\text{Sit} & \end{cases} \\
&\begin{cases}
- b & \\
\text{PL} & \\
\text{COMP} & \\
\text{Sit} & \text{JOHN WORK} & \end{cases} \\
&\begin{cases}
- b & \\
\text{Sit} & \text{BDBY}^+ (\text{[Time NIGHT]}) & \end{cases}
\end{align*}
\]

One consequence of our analysis is that it can predict the fact, observed by Hatav (1997: 46), that atelic predicates, when bounded by durative adverbials such as for a year and until midnight, trigger a sequence interpretation in narrative discourse.

(22) \( \text{He told jokes for 15 minutes, sang for half an hour and danced for another half an hour.} \)

In (22) the italicized VPs are bounded and the interpretation is that he first told jokes, then sang and then danced. However, this sequence reading would not arise without adverbials as in He told jokes, sang and danced. In short, the durative adverbials produce a sequence interpretation. This fact is a direct consequence of the analysis of durative adverbi-

\(^{15}\) Our analysis would predict that the durative into should not follow a for-adverbial. However, this is not the case, as the following example shows. We would like to leave the problem open.

(i) Afternoon practice goes on for several hours into the evening. \quad (\text{COCA})
als as COMP functions.

4. Conclusion

Our analysis of the durative into as a COMP has accounted for the bounding effect and the syntactically unexpressed sense of repetition. These properties, the second one in particular, are hardly explicable in the view of simple composition, that the meaning of a phrase is constructed simply from the meaning of its lexical items plus the way they are syntactically combined. The sense only arises from the interaction of functions in conceptual structure. In this respect, our analysis constitutes a piece of evidence for enriched composition.

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