Studies in Contemporary Phrase Structure Grammar

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1. The lexical integrity of Japanese causatives

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1 Introduction

Grammatical theory has long wrestled with the fact that causative con-
structions exhibit properties of both single words and complex phrases.
However, as Paul Kiparsky has observed, the distribution of such properties
of causatives is not arbitrary: "construal" phenomena such as honorification,
anaphor and pronominal binding, and quantifier "floating" typically behave
as they would if causatives were syntactically complex, embedding construc-
tions; whereas case marking, agreement, and word order phenomena all point
to the analysis of causatives as single lexical items.[1]

Although an analysis of causatives in terms of complex syntactic structures
has frequently been adopted in an attempt to simplify the mapping to semantic
structure, we believe that motivating syntactic structure based on perceived
semantics is questionable because in general a syntax/semantics homo-
morphism cannot be maintained without vitiating syntactic theory (Miller
1991). Instead, we sketch a strictly lexical theory of Japanese causatives that
deals with the evidence offered for a complex phrasal analysis. Such an analysis
makes the phonology, morphology, and syntax parallel, while a mismatch
occurs with the semantics. The conclusions we will reach are given in (1):

(1) a. Japanese causatives must be treated as single verbal forms with complex morphological structure. The causative morpheme should not be treated as a higher predicate as it is in most transformational/GB analyses (following Kuroda 1965), and in Gunji (this volume).

 b. The construal phenomena that seem to motivate an analysis of Japanese causatives in terms of embedded constituent structures can be explained in terms of hierarchical lexical argument structures.

 c. It is possible to maintain a strictly lexical analysis, once a suitable conception of lexical structure and organization is adopted.

Our analysis, which provides a simple alternative to current proposals making extensive use of verb-embedding, functional projections and empty categories, is cast within the framework of head-driven phrase structure grammar (HPSG), but is easily adapted to other lexical frameworks, such as LFG and categorial grammar, and is similar in some respects to lexical GB accounts like those offered by Miyagawa (1980) and Kitagawa (1986).

2   The data

Japanese causative verbs are formed by adding *-(s)ase* to a verb stem, as in (2). The causer is marked with the nominative case particle *ga*, and the causee is marked with the dative particle *ni* (or optionally the accusative particle *o* if the stem was intransitive).

(2) Yumiko ga   Ziroo ni sono hon o   yom-ase-ta.
 Yumiko NOM Ziroo DAT that book ACC read-CAUS-PAST
 "Yumiko made/let Ziroo read that book."

2.1   *Phonological and lexical arguments*

The intuition of the native Japanese speaker regarding the "wordhood" of a causative verb such as *tazune-sase-PRES* "visit-CAUS-PRES" is clear – these verbs are single words. This intuition is supported by a number of phonological observations that have been made by Kitagawa (1986), McCawley (1968), Poser (1984), and others. We present here arguments from allomorphy and reduplication, and suggestive evidence from accentuation (for similar suggestive evidence from voicing spread and downdrift see Kitagawa 1986).

2.1.1   *Allomorphy*

The consonant deletion that converts {\it -sase} to {\it -ase} after consonant stems:

(3) a. tabe -sase -ru
   eat   -CAUS -PRES

 b. kak   -ase -ru
   write -CAUS -PRES

is idiosyncratic rather than a general phonological rule (the general phonological rules would rather yield epenthesis, i.e. *kakisaseru*). This argues that *-sase* is lexically attached.

2.1.2 Reduplication

Repetition of a certain action can be expressed by reduplicating the verb (4a).
Such reduplication with causatives cannot exclude the verb stem (4c):

(4)   a. gohan o   tabe tabe
          rice   ACC eat   eat
          "eating rice repeatedly"
      b. ?gohan o   tabe-sase tabe-sase
          rice   ACC eat-CAUS eat-CAUS
          "causing someone to eat rice repeatedly"
      c. *gohan o   tabe-sase sase
          rice   ACC eat-CAUS CAUS

This argues that *tabe-sase* must be formed in the lexicon, since reduplication
is a lexical process (Marantz 1982).[2]

2.1.3 Accentuation

Kitagawa (1986) presents a number of further arguments based on the theory
of Lexical Phonology (Kiparsky 1982) that show that the past tense mor-
pheme *-ta* and the desiderative morpheme *-ta(i)* attach to their host in the
lexicon. This host can be either a verb root or the causative morpheme
(among other things). For instance, observe the following pattern of accentu-
ation (McCawley 1968, Chew 1961):

(5)   a. tabé-ru (eat-PRES)
      b. tábe-ta (eat-PAST)
      c. tabe-sasé-ru (eat-CAUS-PRES)
      d. tabe-sáse-ta (eat-CAUS-PAST)

Miyagawa (1989) and Kitagawa (1986) argue that under the theory of Lexical
Phonology, these accentual alternations show that the past tense morpheme
attaches lexically. On the assumption that the causative morpheme attaches
to a verb stem before the final tense morpheme, then this evidence would
show that the causative morpheme also attaches lexically. However, we do
not view such arguments as deciding the structure of causatives. One could
accept the lexical attachment of the tense and desiderative morphemes and
still deny the additional assumption mentioned above. We do not know of
further convincing phonological evidence for the lexical analysis of Japanese
causatives beyond that presented in sections 2.1.1 and 2.1.2.[3]

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[2] The awkwardness of (4b) is presumably due to pragmatic factors.
[3] Other putative arguments, like noting that the accent on *-másu* overrides a stem affix across a
    causative affix, also fail because the same accentual phenomena occur with verbal com-
    pounds like *yonde miru*. Poser (class, Stanford, 1993) suggests as a further argument that nor-
    mally any word can be an intonational minor phrase (with focus intonation) in the sense of
    McCawley (1968) but that *-sase* cannot be one. We thank Bill Poser for discussion of the
    phonological data.

2.1.4 Lexicalization, idioms, and blocking

Miyagawa (1980, 1989) presents a variety of arguments from idioms, block-ing, and idiosyncratic causatives (that have undergone semantic drift or which have survived while the base verb has disappeared) to argue for a lexi-cal analysis of Japanese causatives. We take many of these arguments as sug-gestive, but not fully convincing, because there are clear cases in the literature where blocking and semantic drift occur in the syntax (e.g. Poser 1992).

2.2 Morphosyntactic arguments

A large number of morphosyntactic arguments favor the lexical analysis.

2.2.1 Subject honorification

When the person denoted by the subject NP is socially superior to the speaker, the verb that governs that subject conventionally bears subject hon-orification morphology, *o-* and *ni nar-*, as illustrated in (6a), which involves the syntactically complex *-te yaru* construction.[4]

Only the main verb can bear subject honorification morphology in such constructions, as shown by the ungrammaticality of (6b).

(6)   a.   Tanaka-sensei ga   kodomo ni   hon   o   yonde   o-yari   ni
Prof. Tanaka NOM child   DAT book   ACC read-GER HON-give
nat-ta.
become-PAST
"Prof. Tanaka gave the child the favor of reading a book."

       b.   *Tanaka-sensei ga   kodomo ni   hon o   o-yonde   yari ni
Prof. Tanaka   NOM child   DAT book ACC HON-read-GER give
nat-ta.
become-PAST
"Prof. Tanaka gave the child the favor of reading the book."

In contrast, a causative verb as a whole can bear subject honorification mor-phology, whereas the causative morpheme *-(s)ase* alone cannot bear that morphology, as shown in (7):

(7)   a.   Tanaka-sensei ga   Suzuki ni   hon o   o-yom-ase   ni
Prof. Tanaka   NOM Suzuki DAT book ACC HON-read-CAUS
nat-ta.
become-PAST
"Prof. Tanaka made Suzuki read a book."

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[4] We don't gloss the word *ni* which appears in the subject honorific construction because we are not sure what it is. Accentuation suggests that *yari* is a deverbal noun, though it could con-ceivably be the segmentally identical verbal *renyookei*. It is reasonably certain, though, that the morpheme *o-* before *yari* is a prefix attached to the word *yari*.

b. *Tanaka-sensei ga   Suzuki ni hon o   yomi o-sase   ni
   Prof. Tanaka   NOM Suzuki DAT book ACC read HON-CAUS
   nat-ta.
   become-PAST
   "Prof. Tanaka made Suzuki read a book."

This observation argues for a lexical analysis of the causative (Sugioka 1984: 51). If the construction were syntactically complex, the honorific prefix should precede only the causative morpheme, in parallel to (6a). Put differently, in an analysis where causatives involve embedded complement clauses, it is quite mysterious how the honorific prefix *o-* gets to attach to the verb in the lower clause.

Note finally that the other possibility, where honorification occurs inside causativization in the morphology, as in (8), provides no problems for a lexical account. For such a form, honorification occurs to the stem, and then this larger stem is causativized. The resulting pattern whereby the causee is honored falls out of the account we present below, and would be expected to fall out of almost any lexical account.[5]

(8)   Syukutyoku no yoomuin ga   kootyoo-sensei ni yoomuin-situ
       night.duty GEN janitor NOM principal   DAT night.duty.room
       de sibaraku o-yasumi ni nar-ase-te   sasiage-ta (koto)
       in a.little HON-rest become-CAUS-GER give-PAST (fact)
       "The janitor on night duty let the principal take a rest in the night duty room for a little while."

2.2.2 The double-o constraint

Example (9) shows that the causative construction observes the double-*o* constraint (a prohibition on multiple direct objects, marked by the particle *o*: see Harada 1973, Poser 1989). When the embedded verb is transitive, the causee cannot be marked with accusative because this would yield two *o*-marked NPs.

(9)   Taroo ga   Ziroo *o/ni   Kazuo o   home-sase-ta.
       Taro NOM Ziro ACC/DAT Kazuo ACC praise-CAUS-PAST
       "Taro made Ziro praise Kazuo."

The case marking in the morphological causative thus parallels that of the lexical causative (10a) and that of simplex three-argument verbs (10b):

(10) a. Taroo ga   Ziroo *o/ni   e   o   mise-ta.
        Taro NOM Ziro ACC/DAT picture ACC show-PAST
        "Taroo showed a picture to Ziroo."

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[5] Such forms are often pragmatically awkward, however, doubtless due to the incongruity of simultaneously honoring someone and making them the causee.

    b. Taroo ga   Ziroo *o/ni   e   o   age-ta.
       Taro NOM Ziro ACC/DAT picture ACC give-PAST
       "Taroo gave a picture to Ziroo."

Only the lexical analysis predicts the case marking of causatives from the general case marking requirements for three-argument verbs without a further stipulation.

2.2.3 Nominalization

Nominalizations also support the lexical approach. Suffixation of *-kata* creates a nominal meaning "way of," and can apply to causatives (Saiki 1987), as illustrated in (11b).

(11) a. kodomo ni hon o   yom-ase-ta.
        child   DAT book ACC read-CAUS-PAST
        "(I) caused the child to read a book."

      b. (ʔkodomo e   no) hon no yom-ase-kata
         child   DAT GEN book GEN read-CAUS-way
         "the way to cause (the child) to read a book"

The genitive case marking on the object *hon* shows that *yomasekata* is a noun. Under a nonlexical analysis of causatives we would expect to nominalize only *-(s)ase* and to get accusative case *o* after *hon*. Moreover, it would be difficult to account for the accent-deleting properties of *-kata*, within a theory such as Lexical Phonology, unless *yom-ase-kata* is analyzed as a single word.[6]

2.2.4 Question–answer pairs

A question with biclausal structure in Japanese is generally answered by repetition of the higher verb:

(12) a. John ga iku   yoo ni si-ta   kaʔ
        John NOM go-PRES (COMP) do-PAST Q
        "Have (you) arranged for John to go?"

      b. Si-ta (yo).
        do-PAST
        "Yes, I have." *lit.* "Did."

(13) a. John ni [it-te   kure-ru yoo ni] tanon-da kaʔ
        John DAT [go-GER give-PRES (COMP)] ask-PAST Q
        "Have (you) asked John to go?"

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[6] We thank Peter Sells and Bill Poser for most of the ideas that underlie this section. It should be mentioned, though, that this argument only shows that the noun *yomasekata* is a word, and not necessarily that the corresponding verbal forms are, as was pointed out to us by a reviewer.

b. Tanon-da (yo).
ask-PAST
"Yes, I have." *lit.* "Asked."

But one cannot answer a question formed with a causative construction by just a causative morpheme. Rather one must repeat the whole causative form (i.e. including the putative embedded verb):

(14) a. John o   ik-ase-ta   ka?
John ACC go-CAUS-PAST Q
"Have you caused John to go?"

b. *Sase-ta.
CAUS-PAST

This behavior requires a special stipulation on the nonlexical account. It is predicted if the causativized verb is treated as a lexical item.

2.2.5 *Word order*

When a causative verb takes a theme argument and a location argument, the unmarked order is location–theme, not theme–location. For instance, in a pair like:

(15) a. no ni hana o   sak-ase-ru
field in flower ACC bloom-CAUS-PRES
"to cause flowers to bloom in fields"

b. hana o   no ni sak-ase-ru
flower ACC field in bloom-CAUS-PRES
"to cause flowers to bloom in fields"

the first sentence, which has the location–theme order, is unmarked. The second sentence is somewhat less natural, and seems to be acceptable only when the location argument gets focus interpretation. This observation is unexpected under the nonlexical analysis, because it predicts that the causee argument (here, the theme) should precede all the embedded arguments in the unmarked word order, assuming that the order produced by clausal embedding is the unmarked order. In contrast, this unmarked ordering is predicted under a lexical account where it reflects the normal rules for ordering clausal constituents (Kuno 1973: 351).

2.2.6 *Potential*

Japanese has a morpheme, *-(rar)e*, which adds a notion of ability or possibility to the meaning of a verb. When this morpheme is introduced into a clause, an argument which was marked in the accusative may optionally be marked with the nominative:

(16) a. Mitiko wa hon o   yon-da
Mitiko TOP book ACC read-PAST
"Mitiko read the book."

b. Mitiko wa hon ga/o   yom-e-ru
   Mitiko TOP book NOM/ACC read-POT-PRES
   "Mitiko can read the book."

The generalization applies even to potentialized causatives (although the resulting sentences are somewhat less natural):

(17) ?Taroo ga   kodomo ni piano ga   naraw-ase-rare-nakat-ta (koto)
       Taroo NOM child   DAT piano NOM learn-CAUS-POT-NEG-PAST (fact)
       "(the fact that) Taroo was not able to make the child learn how to play the piano"

This fact would lack any natural explanation on a nonlexical analysis which treats the third NP in (17) as belonging to an embedded clause. But it follows naturally on the lexical analysis: the third NP is treated as an argument of the potentialized verb, so its case marking is predicted by the same generalization that specifies the case marking for potentialized simplex verbs, such as in (16b).

2.2.7 *Negative polarity items and reciprocals*

It is generally accepted that the negative polarity item *sika* "except" can only be licensed by a negative in its own clause (Muraki 1978, Kitagawa 1986: 136).[7] For instance, the following is impossible:

(18) *Watasi wa [kare ga   biiru sika   nom-u]   to   sir-ana-katta.
        I   TOP he   NOM beer except drink-PRES COMP know-NEG-PAST
        "I didn't know that he drinks anything but beer."

But note now that *sika* is licensed on an argument of the verb stem in a causative, even though the sentential negation occurs after *(s)ase-*:

(19) ano ban watasi wa Taroo ni biiru sika   nom-ase-na-katta.
      that night I   TOP Taroo DAT beer except drink-CAUS-NEG-PAST
      "That night, I made/let Taroo drink only beer" *lit.* "…not drink except beer."

This argues that a causative sentence is a single clause. Similar arguments can be made with respect to the reciprocal morpheme *-a(w)*: see Kitagawa (1986: 174), although, as noted there, there is considerable variation in the acceptance of reciprocalized causatives.

2.3   *Syntactic puzzles for a lexical analysis*

Now let us turn to syntactic arguments, which are often taken to favor a non-lexical analysis. We will show that all relevant data can in fact be satisfactorily

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[7] *Sika* cooccurs with a negative verb as an NPI. It is generally translated as "only" in English in a positive sentence.

explained within the lexical analysis we develop. We begin with what we take to be two nonarguments, and then consider in turn data from adverb scope, apparent coordination, binding, and quantifier scope.

2.3.1 Nonarguments from anaphora and intervening particles

Shibatani (1973) argues for a nonlexical analysis on the grounds that the putative pro-VP *soo s-* "do so" may refer to either a whole causation event or the lower predicate. However, many people have expressed skepticism as to whether *soo s-* is a pro-VP (Hinds 1973, Miyagawa 1980). It is not the case that *soo s-* always takes a VP antecedent, since the antecedent can be an event expressed by two conjoined sentences in a previous discourse:

(20) A: Taroo wa Yamada-sensei ni ai   ni   it-ta.
          Taroo TOP Yamada-teacher DAT meet PURP go-PAST
          "Taroo went to see Prof. Yamada."
          Suisenzyoo   o   kaite morau yoo   tanon-da.
          recommendation ACC write receive COMP ask-PAST
          "He asked for a letter of recommendation to be written for him."

      B: Hanako mo soo si-ta.
          Hanako also so do-PAST
          "Hanako did so, too."

This suggests that the antecedent of *soo suru* might better be described in terms of the cognitive structure of events than via syntactic notions of constituency.

   Kuroda (1981) argues for a syntactic analysis of causatives on the basis of the ability of the negative morpheme *na-* and certain particles such as *mo* "also" and *sae* "even" to intervene between a verb stem and what he takes to be a bare causative morpheme. However, any such argument is greatly weakened by the homonymy between the causative *sase-* and the form that results from adding *-(s)ase* to the verb stem *s-* "do": *s-* + *-(s)ase* → *s-ase*. See Miyagawa (1989) and particularly Kitagawa (1986: 184) for evidence establishing that the allegedly problematic examples are actually manifestations of the causative of *s-* "do".

2.3.2 Adverb scope

Next, we consider adverb scope. Adverbs in the causative construction can in general be interpreted as modifying either the event denoted by the verb stem or the causation event (Shibatani 1990: 314). For instance, (21) is ambiguous.

(21) Noriko ga   Masaru ni   gakkoo de hasir-ase-ta.
       Noriko NOM Masaru DAT school at run-CAUS-PAST
       "Noriko made Masaru run at school"

What happened at school may be either the causing event performed by Noriko or the running event caused by Noriko and performed by Masaru.

If adverb scope could be captured only by providing phrase structural domains for an adverb to take scope over, then this would be an argument for a syntactic analysis. Different interpretations could be obtained by assuring different positions for the adverb as illustrated in (22).

(22)   a. [Noriko ga Masaru ni [gakkoo de [[hasir]-ase]]]

b. [Noriko ga Masaru ni [[gakkoo de [hasir]]-ase]]

On this view, the ambiguity of adverb scope is attributed to the presence of an embedding structure, i.e. the presence of two sentential domains over which adverbs can take scope. Some authors have suggested that, as a result, certain adverb positions have unambiguous scope readings, as shown in (23).

(23)   a. Taroo ga   damatte Hanako o   heya ni   hair-ase-ta.
Taroo NOM silently Hanako ACC room into enter-CAUS-PAST
"Taroo made Hanako enter the room silently." [unambiguous]
(Miyagawa 1980)

b. Damatte Taroo ga   Hanako o   heya ni   hair-ase-ta.
Silently Taroo NOM Hanako ACC room into enter-CAUS-PAST
"Taroo made Hanako enter the room silently." [unambiguous]
(Miyagawa 1980)

While a full account of different scope preferences for adverbs is beyond the scope of this paper, we note that various proposed structural restrictions on scope have been contested (e.g. by Kitagawa 1986: 89), and in particular there exist sentences such as those in (24) in which the adverb appears in structurally the same position as in (23a), but where it can clearly modify either the causation event or the caused event. We will take it as our goal to allow both scopal possibilities for all adverb positions within the clause.

(24)   a. Ken ga   hitori de Naomi ni hon o   yom-ase-ta.
Ken NOM by oneself Naomi DAT book ACC read-CAUS-PAST
"Ken made Naomi read the book by herself."
"Ken made Naomi read the book all by himself."

b. Ken ga   damatte Naomi o   suwar-ase-ta.
Ken NOM silently Naomi ACC sit-CAUS-PAST
"Ken (silently) made Naomi sit (silently)."

c. Ken ga   zibun no pen de Naomi ni sakubun   o
Ken NOM self   GEN pen with Naomi DAT composition ACC
kak-ase-ta.
write-CAUS-PAST
"Ken (with his own pen) made Naomi write a composition (with her own pen)."

2.3.3   Coordination

It is sometimes assumed that examples like (25) involve coordinate structures, even though there is no overt coordinating particle.

(25) Ken wa Naomi ni [[hurui kutu o   sute]-te [atarasii kutu o
      Ken TOP Naomi DAT old   shoes ACC throw-GER new   shoes ACC
      kaw]] -ase-ta.
      buy   CAUS-PAST
      "Ken made Naomi throw away her old shoes and buy new ones."

Given this assumption, the intended reading suggests, as noted by Gunji
(1987), that the VPs *hurui kutu o sute* and *atarasii kutu o kaw* are conjoined and
-sase is attached to this complex VP.

   These sentences, however, cannot provide strong evidence for any nonlexical analysis because the phrases containing a gerundive verb (*sutete*) should
be considered as adverbial phrases, rather than as conjoined VPs.[8] Sentence
(26) shows that the phrase "throw away old shoes" is indeed acting as an AdvP
because, as an adjunct, it can be placed inside the middle of the other supposed conjunct.[9]

(26) Ken wa Naomi ni atarasii kutu o   [hurui kutu o   sute-te]
      Ken TOP Naomi DAT new   shoes ACC old   shoes ACC throw
      kaw-ase-ta.
      buy-CAUS-PAST
      "Ken made Naomi throw away old shoes and buy new shoes."

   Asymmetries in the desiderative *ga/o* alternation with these putative
"coordinated VPs," as in (27), provide further support for our claim (Sugioka
1984: 168).

(27) a. *Boku wa [kootya ga   non-de], [keeki ga   tabe]-tai.
           I   TOP tea   NOM drink-GER cake NOM eat-DESIRE
         "I want to drink tea and eat cake."

      b. *Boku wa [kootya ga   non-de], [keeki o   tabe]-tai.
           I   TOP tea   NOM drink-GER cake ACC eat-DESIRE

      c. ?Boku wa [kootya o   non-de], [keeki ga   tabe]-tai.
           I   TOP tea   ACC drink-GER cake NOM eat-DESIRE

      d. Boku wa [kootya o   non-de], [keeki o   tabe]-tai.
         I   TOP tea   ACC drink-GER cake ACC eat-DESIRE

These asymmetries can be explained by assuming that the first apparent VP
is actually an AdvP, and that therefore the case marking of the first object
(*kootya* "tea") cannot be affected by properties of the suffix *-tai*.

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[8] We thank Michio Isoda for some of the ideas behind this section.
[9] Some speakers appear to rate this sentence as deserving a "?" in front, while others regard it as
    fine. At any rate, this situation contrasts clearly with real conjunction.

Third, note the behavior of relativization:

(28) a. [Ken ga Naomi   ni [hurui kutu o   sute-te] kaw-ase-ta]
          Ken NOM Naomi   DAT old   shoes ACC throw   buy-CAUS-PAST
          atarasii kutu
          new   shoes
          "the new shoes which Ken made Naomi throw away old shoes and
          buy"

      b. *[Ken ga   Naomi ni [sute-te] atarasii kutu o   kaw-ase-ta]
          Ken NOM Naomi DAT throw   new   shoes ACC buy-CAUS-PAST
          hurui kutu
          old   shoes
          "the old shoes which Ken made Naomi throw away and buy new
          ones"

The linearly second object ("new shoes") can be relativized as in (28a), while
the first object ("old shoes") cannot (28b). If (28a) were actually a case of
coordination, then it should be bad as a violation of the Coordinate Structure
Constraint.

   We hasten to add that the same asymmetries are found with *renyookei* "co-
ordination" as well. The desiderative alternation is illustrated in Sugioka
(1984: 168), and the same relativization facts hold as above. Our consultants
judge scrambling with *renyookei* "coordination" less acceptable than with *-te*
form "coordination," but not impossible. We have no explanation for this at
present.

2.3.4 *Binding*

Binding facts are used as further syntactic evidence to support a nonlexical
analysis (Kuroda 1965). It has been widely accepted in the literature that
zibun ("self") is a subject-oriented reflexive. The fact that causee arguments
can antecede reflexives as shown in (29) appears to support the embedding-
structure analysis of causatives: *zibun*-binding to the cause *Taroo* is possible
because *Taroo* is the embedded complement subject.

(29) Hanako ga   Taroo ni zibun no syasin o   mi-sase-ta.
      Hanako NOM Taroo DAT self GEN picture ACC see-CAUS-PAST
      "Hanako$_i$ made Taroo$_j$ see her$_i$/his$_j$ picture."

In contrast, the standard judgment is that there is no ambiguity in (30) where
the lexical causative form *miseru* ("show") is used.[10]

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[10] This conclusion is questioned in some work such as Momoi (1985) and Iida (1992), but we
      will accept it here.

(30) Hankao ga   Taroo ni zibun no syasin o   mise-ta.
     Hanako NOM aro   DAT self   GEN picture ACC show-PAST
     "Hanako showed Taroo her/*his picture."

However, as Iida (1992, 1996) has shown, there are good reasons to question the subject-based account of *zibun*-binding. There are many clear counterexamples such as those in (31):

(31) a. Zibun no buka   no husimatu   ga   Taroo no
        self   GEN subordinate GEN misconduct NOM Taroo NOM
        syusse   o   samatage-ta.
        promotion ACC mar-PAST
        "The misconduct of his$_i$ subordinate marred Taroo$_i$'s promotion."

     b. Taroo wa   Ziroo$_i$ ni zibun$_i$ no ayamati o   satosi-ta.
        Taroo NOM Ziroo DAT self   GEN mistake ACC make-realize-PAST
        "Taroo made Ziroo$_i$ realize his$_i$ mistake."

But even assuming the subject-based generalization is basically right, it is possible to account for the *zibun*-binding facts without assuming an embedded constituent structure. Within HPSG, binding theory is universally based on argument structure, and hence the subject-orientation of *zibun*-binding need not be stated in terms of constituent structure at all. We return to this matter in section 4.2.1.

   Both the overt pronoun *kare* ("he") and the zero pronoun ("little pro") are regarded as pronominal elements and subject to Principle B, as shown in (32):

(32) *Taroo$_i$ wa Hanako ni   kare$_i$ o/ø$_i$ sarakedasi-ta.
      Taroo TOP Hanako DAT he ACC/pro reveal-PAST
      "Taroo$_i$ revealed him$_i$ to Hanako."

However, in the morphological causative construction, as shown in (33), *kare* and the zero pronoun in the lower object position may be bound by the subject, but must be disjoint in reference with the dative causee (Kitagawa 1986, Shibatani 1990).

(33) a. Taroo$_i$ wa Ziroo$_j$ ni kare$_{i/*j}$ o   bengo s-ase-ta.
        Taroo TOP Ziroo DAT he   ACC defense do-CAUS-PAST
        "Taroo$_i$ made Ziroo$_j$ defend him$_{i/*j}$."

     b. Taroo$_i$ wa Ziroo$_j$ ni ø$_{i/*j}$ bengo s-ase-ta.
        Taroo TOP Ziroo DAT   defense do-CAUS-PAST
        "Taroo$_i$ made Ziroo$_j$ defend him$_{i/*j}$."

These facts have also been used as evidence to support the embedded analysis of the morphological causative.

Although *kare* exhibits various peculiarities that challenge its traditional classification as a simple pronominal,[11] we will nonetheless assume here that it falls within the scope of Principle B, and seek to explain this behavior, too, in terms of an argument-structure-based theory of binding.

2.3.5 Quantifier scope

Finally, we consider a problem about quantifier scope similar to that posed by the interaction of adverbs and causatives. A quantified NP functioning as the lower object of a causative verb form can take intermediate scope, i.e. can take scope over the verb stem, but be outscoped by the causative operator, as illustrated in (34).

(34) Tanaka-sensei ga gakusei ni sansatu hon o   sirabe-sase-ta.
　　　Prof. Tanaka NOM student DAT three   book ACC check-CAUS-PAST
　　　"Prof. Tanaka made the student check three books."

Perhaps clearer examples of ambiguous scopal interpretation involving the quantifier particle *sika* "except" (recall section 2.2.7) are discussed by Kitagawa (1986: 138). Sentence (35a) can mean either (i) only with respect to beer, I brought about a situation such that Taroo drank it (not the whiskey, etc.) or (ii) I brought about a situation such that Taroo would drink only beer (and no whiskey, etc.), and a similar ambiguity exists in the interpretation of (35b).

(35) a. ano ban watasi wa Taroo ni biiru sika   nom-ase-na-katta.
　　　　　that night I   TOP Taroo DAT beer except drink-CAUS-NEG-PAST
　　　　　"That night, I made/let Taroo drink only beer" *lit.* ". . . not drink except beer."

　　　 b. Rupan wa tesita   ni hooseki sika   nusum-ase-na-katta.
　　　　　Lupin TOP follower DAT jewelry except steal-CAUS-NEG-PAST
　　　　　"Lupin made/let his followers steal only the jewelry."

In light of these observations, it is essential that any lexical account of causatives make clear how it can deal with such ambiguous scope assignments. Under the assumption that the causative is a single lexical entity, the problem posed by such examples is basically the problem of how to assign

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[11] For example, *kare* does not serve as a bound variable: *kare* does not refer to the quantified subject NP in (i) and (ii).

　　(i) ?*dono otoko$_i$ mo kare$_i$ no tomodati o   hihan   si-ta.
　　　　　which man   also he   GEN friend   ACC criticism do-PAST
　　　　　"Every man$_i$ criticized his$_i$ friend."
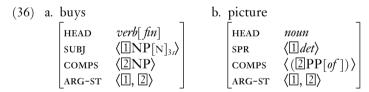
　　(ii) *dono otoko$_i$ mo [Masaru ga kare$_i$ o   hometa] koto ni odoroi-ta.
　　　　　which man   also Masaru NOM he   ACC praised COMP DAT be surprised-PAST
　　　　　"Every man$_i$ was surprised at the fact that Masaru praised him$_i$."

　　Furthermore, as Takubo (1990) observes, *kare* can only refer to a person whose identity has been established in the speaker's knowledge.

"word-internal" scope to a quantified NP that appears external to the lexical causative. The account must predict that a quantified argument of the causative verb can be interpreted as having narrow scope with respect to the causative operator, even though there is no syntactic constituent to serve as the basis of that particular scope assignment.

3   Background and basics of the analysis
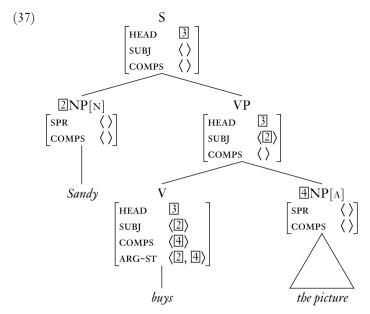
3.1   Essentials of HPSG

Our general proposal for a lexical treatment of -*sase* causatives is compatible with a variety of lexicalist frameworks. The crucial ingredient we need is a theory of word formation that allows constraints to apply to the argument structures of both the causative verb as a whole and also the stem to which the causative suffix is added.[12] The conception of argument structure that we employ is based on essentially the same notion of SUBCAT lists as that used by Pollard and Sag (1987) and Gunji (1987). However, following recent work in HPSG,[13] we distinguish argument structure (ARG-ST) from a word's valence, which is specified in terms of the features SUBJECT (SUBJ), COMPLEMENTS (COMPS), and SPECIFIER (SPR). Canonically, the values of a word's valence features "add up" (via list concatenation [or the "append" relation]) to the verb's ARG-ST value, as illustrated for the English words in (36).[14]

(36) a. buys   b. picture

$$
\begin{bmatrix}
\text{HEAD} & verb[\,fin] \\
\text{SUBJ} & \langle \boxed{1}\text{NP}[\text{N}]_{3,s} \rangle \\
\text{COMPS} & \langle \boxed{2}\text{NP} \rangle \\
\text{ARG-ST} & \langle \boxed{1},\ \boxed{2} \rangle
\end{bmatrix}
\qquad
\begin{bmatrix}
\text{HEAD} & noun \\
\text{SPR} & \langle \boxed{1}det \rangle \\
\text{COMPS} & \langle (\boxed{2}\text{PP}[\,of\,]) \rangle \\
\text{ARG-ST} & \langle \boxed{1},\ \boxed{2} \rangle
\end{bmatrix}
$$

In this theory, it is the valence features (not ARG-ST) whose values are "cancelled off" (in a categorial grammar-like manner) as a head projects a phrase. A lexical head combines with its complements and subject or specifier (if any) according to the lexically inherited specification, as shown in (37).

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[12] The notion of argument structure draws from related work in many frameworks, for instance Kiparsky (1987), Rappaport and Levin (1988), Bresnan and Zaenen (1990), Grimshaw (1990), Alsina (1993), and Butt (1993). Our conception of argument structure is developed more fully in Manning and Sag (1998). Let us merely note that in this work argument structure has the following three properties: (1) it is a syntactic construct that is crucially distinct from semantic structure (Manning 1994), but systematically related to it (Davis 1996); (2) it is associated only with *lexical signs*, not *phrases*; and (3) it is the locus of binding theory.

[13] Borsley (1989), Pollard and Sag (1994: ch. 9), Miller and Sag (1997), Abeillé and Godard (1994).

[14] Here and throughout, we are ignoring the details of the feature geometry of HPSG signs, displaying only those features that are of direct relevance. We return below to the issue of argument conservation, i.e. the relation between the values of valence features and argument structure.

(37)

$$
\text{S}
\begin{bmatrix}
\text{HEAD} & \boxed{3} \\
\text{SUBJ} & \langle\,\rangle \\
\text{COMPS} & \langle\,\rangle
\end{bmatrix}
$$

$$
\boxed{2}\text{NP[N]}
\begin{bmatrix}
\text{SPR} & \langle\,\rangle \\
\text{COMPS} & \langle\,\rangle
\end{bmatrix}
$$

$$
\text{VP}
\begin{bmatrix}
\text{HEAD} & \boxed{3} \\
\text{SUBJ} & \langle\boxed{2}\rangle \\
\text{COMPS} & \langle\,\rangle
\end{bmatrix}
$$

Sandy

$$
\text{V}
\begin{bmatrix}
\text{HEAD} & \boxed{3} \\
\text{SUBJ} & \langle\boxed{2}\rangle \\
\text{COMPS} & \langle\boxed{4}\rangle \\
\text{ARG-ST} & \langle\boxed{2}, \boxed{4}\rangle
\end{bmatrix}
$$

$$
\boxed{4}\text{NP[A]}
\begin{bmatrix}
\text{SPR} & \langle\,\rangle \\
\text{COMPS} & \langle\,\rangle
\end{bmatrix}
$$

buys   *the picture*

Unlike English, we assume for Japanese that subjects and complements can be cancelled in any order and in any quantity, predicting clause-bounded scrambling.[15]

The ARG-ST list remains unaffected in the construction of syntactic phrases, except that, in virtue of the various identities between ARG-ST members and members of valence lists, the ARG-ST list's members become fully specified as the valence list values are identified with actual subjects, complements, and specifiers. Once a complete phrase is constructed, the lexical head's ARG-ST list is a fully specified hierarchical argument structure. As we will see below, it is the ARG-ST list that is the locus of binding theory.

3.2   Lexical organization and morphology

Basic lexical entries, which we may think of as morphological stems, give rise to further forms through the application of morpholexical processes of various kinds. A number of techniques have been developed for the description of complex morphological forms within lexicalist frameworks, including the lexical rules approach sketched in Pollard and Sag (1987) and Flickinger (1987), a type-based treatment of lexical rules developed by Copestake (1992), and the "type-based" approach to morphology developed by Riehemann (1993, 1995). Our basic analysis of Japanese causatives is compatible with any of

---

[15] Alternatively, following Kathol (1995), Japanese subjects and complements belong to a single ordering domain, which sanctions essentially the same word order freedom in virtue of the paucity of Japanese linear precedence constraints.

these approaches, but we will here develop our account in terms of a theory of derivational types, which specify a declarative relationship between a SOURCE stem and a RESULT stem (which is morphologically "derived" from it). Such an approach is closely related to what Copestake proposes (see also Meurers 1995). It has the advantages of allowing inheritance within the hierarchical lexicon of HPSG to extend over both stem and word types and derivational types (as in Riehemann's approach) while preserving the locality of information and lexical integrity of words within the syntax that is well-captured within the lexical rules approach. The first point means that all stem, word, and derivational types are organized into a hierarchy of types, each of which is associated with appropriate constraints. Extending the type hierarchy over derivational types and their result types more easily allows the various patterns of causatives and their linking patterns to be expressed. The second point implies that the formalism allows only a constrained correspondence between two stems, and hence entails a certain notion of locality. Only information specifically carried over from input to output by the rule is visible in the context where the causative stem occurs, and the syntax has no other access to the derivational history of a word.

That is, we assume that the basic lexical entry for the stem *buy* need stipulate only the information shown in (38):

(38) *buy*: $\begin{bmatrix} \textit{v-stem} \,\&\, \textit{strict-trans} \\ \text{CONTENT} \quad \textit{buy-rel} \end{bmatrix}$

where *v(erb)-stem* and *strict-trans(itive)* are distinct types associated with the constraints illustrated in (39):

(39)   a.   *strict-trans*: [ARG-ST $\langle$NP, NP$\rangle$]
       b.   *v-stem*: [HEAD   *verb*]

Moreover, in the spirit of Wechsler (1995) and Davis (1996), we will assume that the projection of semantic roles to syntactic argument structure is mediated by general principles also formulated as constraints on lexical types. First, we assume, following Davis, that *buy-rel* is a subtype of *act(or)-und(ergoer)-rel*. This leads to the attributes ACTOR and UNDERGOER being appropriate for *buy-rel*, and this classification, together with inheritance of the constraints in (39), means that the stem *buy* inherits all the information shown in (40):

(40) *buy*: $\begin{bmatrix} \textit{strict-trans} \\ \text{HEAD} \quad\quad \textit{verb} \\ \text{ARG-ST} \quad\quad \langle\text{NP, NP}\rangle \\ \text{CONTENT} \quad \begin{bmatrix} \textit{buy-rel} \\ \text{ACTOR} \quad\quad [\ ] \\ \text{UNDERGOER} \quad [\ ] \end{bmatrix} \end{bmatrix}$

The classification of *buy-rel* as a subtype of *act-und-rel* is also the key to explaining its argument projection properties. Because of the general relation

(a subsumption-preserving homomorphism) that Davis establishes between stem types and types of semantic relation, it follows that any stem like *buy* must obey the constraints established for superordinate stem types.

To see this, let us examine the case of *buy* a bit more closely. Davis posits stem types like those shown in (41).[16]

(41)   a. *actor-stem*:
$$\begin{bmatrix} \text{CONTENT} & \begin{bmatrix} act\text{-}rel \\ \text{ACTOR} \quad i \end{bmatrix} \\ \text{ARG-ST} & \langle \text{NP}_i, \dots \rangle \end{bmatrix}$$

   b. *undergoer-stem*:
$$\begin{bmatrix} \text{CONTENT} & \begin{bmatrix} und\text{-}rel \\ \text{UNDERGOER} \quad j \end{bmatrix} \\ \text{ARG-ST} & \langle \dots \text{NP}_j, \dots \rangle \end{bmatrix}$$

Because *buy-rel* is a subtype of *act-und-rel*, which in turn is a subtype of both *actor-rel* and *undergoer-rel*, the strong correspondence between stem types and relation types requires that the stem *buy* must also be a subtype of both stem types in (41). Thus the stem *buy* must also inherit the constraints associated with those types. Unifying the constraints in (41) with the information in (40), we derive the correct linking pattern for *buy*, as shown in (42).

(42)   *buy*:
$$\begin{bmatrix} strict\text{-}trans \\ \text{HEAD} & verb \\ \text{ARG-ST} & \langle \text{NP}_i, \text{NP}_j \rangle \\ \text{CONTENT} & \begin{bmatrix} buy\text{-}rel \\ \text{ACTOR} & i \\ \text{UNDERGOER} & j \end{bmatrix} \end{bmatrix}$$
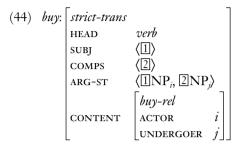
The canonical relation between ARG-ST and VALENCE features is also determined by a general type constraint, namely the constraint on the type *stem*.

(43)   *stem*:
$$\begin{bmatrix} \text{SUBJ} & \boxed{1} \\ \text{COMPS} & \text{compression}(\boxed{2}) \\ \text{ARG-ST} & \boxed{1} \oplus \boxed{2} \end{bmatrix}$$

Here $\oplus$ designates the operation of list concatenation (or append). For the moment, we may assume that compression is just the identity function, and the constraints of this type just cause the ARG-ST to be the list concatenation of the SUBJ and COMPS lists (as illustrated earlier). An independent constraint guarantees that a stem's SUBJ value is a singleton list. Thus, because *strict-trans* is a subtype of *stem*, *buy* must inherit the information in (43) as well. Hence, in virtue of the system of lexical types and the associated type constraints,

---

[16] Davis's work follows a tradition pioneered in particular by Gawron and Wechsler, incorporating certain specific semantic analyses proposed by Pinker, and adapting ideas of Jackendoff. For an overview of the history of these ideas, see Davis (1996).

the minimal lexical entry for the stem *buy* given in (38) above is sufficient to guarantee that *buy* actually contains all the information in (44).

(44) *buy*:
$$\begin{bmatrix} \textit{strict-trans} \\ \text{HEAD} \quad \textit{verb} \\ \text{SUBJ} \quad \langle \boxed{1} \rangle \\ \text{COMPS} \quad \langle \boxed{2} \rangle \\ \text{ARG-ST} \quad \langle \boxed{1}\text{NP}_i, \boxed{2}\text{NP}_j \rangle \\ \text{CONTENT} \begin{bmatrix} \textit{buy-rel} \\ \text{ACTOR} \quad i \\ \text{UNDERGOER} \quad j \end{bmatrix} \end{bmatrix}$$
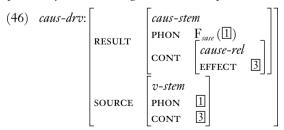
This result is obtained in a principled, deductive fashion from constraints of considerable generality. In section 5, we will extend this treatment to include a lexical account of quantifier scoping as well.

3.3   Causative stems

Causative stems bear a systematic phonological, syntactic, and semantic relation to the verb stems from which they are formed. The information that must be specified within any analysis of Japanese causative stems is the following:

(45) a. *-(s)ase* is suffixed in the PHONOLOGY,
      b. the stem's CONTENT is embedded as the EFFECT argument of the derived form's CONTENT, which is a ternary *cause-rel* relation,
      c. the derived form's argument structure contains a causer subject and a causee complement (inter alia).

Our intention is to account for these properties in terms of a single derivational type, *caus(ative)-drv*, the grammatical constraints particular to that type, and their interaction with constraints on other related lexical types. We posit only the following constraints as particular to the type *caus-drv*:[17]

(46) *caus-drv*:
$$\begin{bmatrix} \text{RESULT} \begin{bmatrix} \textit{caus-stem} \\ \text{PHON} \quad \text{F}_{\textit{sase}}\,(\boxed{1}) \\ \text{CONT} \begin{bmatrix} \textit{cause-rel} \\ \text{EFFECT} \quad \boxed{3} \end{bmatrix} \end{bmatrix} \\ \text{SOURCE} \begin{bmatrix} \textit{v-stem} \\ \text{PHON} \quad \boxed{1} \\ \text{CONT} \quad \boxed{3} \end{bmatrix} \end{bmatrix}$$

First, let us consider the linking properties of causatives. The type *cause-rel* (like *buy-rel*) is a subtype of *act-und-rel*. Hence (by the same reasoning

---

[17] The function $\text{F}_{\textit{sase}}(\text{X})$ yields X+*sase*, if X is vowel-final, and X+*ase* otherwise.

outlined in the previous section) the relation/stem correspondence ensures that *caus-stem* is a subtype of both *actor-stem* and *undergoer-stem*, which in turn entails that the first ARG-ST member is linked to the causer (ACTOR) and the second ARG-ST member to the causee (UNDERGOER), as shown in (47):

$$(47) \quad \textit{caus-stem:} \begin{bmatrix} \text{PHON} & \text{F}_{sase}\,(\boxed{1}) \\ \text{ARG-ST} & \langle \text{NP}_i, \text{NP}_j, \ldots \rangle \\ \text{CONT} & \begin{bmatrix} \textit{cause-rel} \\ \text{ACTOR} & i \\ \text{UNDERGOER} & j \\ \text{EFFECT} & \boxed{3} \end{bmatrix} \end{bmatrix}$$

As for the rest of the causative stem's ARG-ST, we will assume that this is a list consisting of just the ARG-ST value of the noncausative stem, itself a list. The causative's ARG-ST value is thus a "nested" list (a list that contains another list as a member), a fact that will play a crucial role in our account of constraints on binding.

On our analysis, causatives acquire such nested argument lists in virtue of the fact that *caus-drv* is a subtype of another type that we will call *complex-pred(icate)-drv*. A first version of the constraints on the type *complex-pred-drv* (in Japanese) are the following:[18]

$$(48) \quad \textit{complex-pred-drv:} \begin{bmatrix} \text{RESULT} & [\text{ARG-ST} & \langle \boxed{1}, \boxed{2}, \boxed{4}\langle \text{PRO}, \ldots \rangle \rangle] \\ \text{SOURCE} & [\text{ARG-ST} & \boxed{4}] \end{bmatrix}$$

"PRO" here designates a special type of element that is associated with the subject of the basic stem. PRO is coindexed with some member of the (outer) ARG-ST list in accordance with fundamentally semantic principles similar to those outlined for English control constructions in Sag and Pollard (1991) (see Davis 1996). At least for Japanese causatives, though perhaps not for all instances of the type *comp-pred*, it is the second ARG-ST member (the causee) that is co-indexed with PRO. Note that PRO is never an overt subject or complement.

Because of the list embedding in (48), we must modify our account of the linking relation between ARG-ST and VALENCE. This is where the function compression is needed. The idea is still that the SUBJ and COMPS lists add up to the argument structure, but we need to remove the embedded lists and PRO elements from the argument structure. Informally, what compression will do is flatten out embedded lists in the ARG-ST list, promoting their members to be on a par with the other list members and deleting embedded PROs in the process (hence the name compression).[19]

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[18] We will later revise this to incorporate our account of lexicalized quantifier scoping.
[19] The function compression can be defined as follows ("←" designates "only if"):

   (i)   compression($\langle\,\rangle$) = $\langle\,\rangle$.
   (ii)   compression($\langle PRO \mid Y \rangle$) = Z ← compression(Y) = Z.