

Enriched meanings and pseudo-incorporated bare singular count nouns in English

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01. and 02. November 2019
Event Semantics Workshop 2019

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Introduction

Bare singular count nouns are generally barred in the verbal internal argument position in English (compared to bare singular plurals and mass nouns):

(1) He reads poetry/poems/*poem.

However, there are some exceptions, such as nouns denoting locations (Stvan 2009).

- (2)
- a. in prison, in church
 - b. at home, at school
 - c. on campus

Introduction

This talk: there are cases of bare singular count nouns in the direct object position of a verb. Some examples:

- (3) a. drive bus, drive truck
- b. tend bar
- c. teach school, teach college
- d. wait table

Largely gone unnoticed and unremarked on (even by Stvan), possibly due to being partially dialectal in nature. But, not so difficult to find attestations:

- (4) a. He **drove bus** for 55 years. There was hardly anything about it he didn't like. (Google)
- b. Blake worked at the Nuart Theatre and **drove truck** during potato harvest. (Google)
- c. Meanwhile, with her career going nowhere, she did what every hopeful actress in Hollywood does at least once: she **waited table**. (Google)
- d. Colleen showed up exactly at 10 a.m. She **teaches school** at the UCLA Elementary School, but she had the day off. (Google)

Interpretation

- Interpretation of these object BSNs + verb is similar to the institutionalization or name-worthiness that characterizes the meaning of noun incorporation in other languages (Dayal 2015, Mithun 1984).
- In the English cases, these often have the interpretation that the subject of the sentence performs the event as their job or profession, as the examples in (5) suggest.

- (5)
- a. He drives truck for a living.
 - b. He drove truck for twenty years before retiring.
 - c. He drives truck occasionally.
(→ Occasionally, he earns a wage driving a truck.)

- Resembles the “activity implicature” that bare count noun objects of prepositions get (Stvan 2009).

- (6)
- a. in church \neq in the church
 - b. at school \neq at the school

Goals

- Argue that these BSNs are an instance of pseudo-incorporation.
- Give an initial account of their semantic properties using tools from frame semantics (Petersen 2007).
- Provide an explanation of the “institutionalization” of the event using the social ontology developed by Anderson & Löbner (2018) for role-denoting relational adjectives, and cascades as developed by Löbner (2019).
- My story will also account for a relative lack of modification of both the noun and the VP.

Data

Disclaimer: dialect data

- The cases of BNs under discussion here seem to be somewhat dialectal and colloquial.¹
- Some examples are better than others; not all speakers accept all examples.
- Possibly restricted to some varieties of North American English, including Canadian English and American English as spoken in the US Midwest.



- Attempted to back up my own intuitions regarding the data using the intuitions of family members, friends, and Google.
- Lots of junk on Google, naturally, but I've tried to use mostly books or newspapers.

¹For instance, see the consternation here: <https://english.stackexchange.com/questions/310498/im-a-teacher-and-i-teach-at-in-school-or-at-in-a-school>

Data

More examples:

- drive truck
- drive bus
- drive tram
- drive carriage
- tend bar
- teach school
- teach university
- teach high school
- keep book
- wait table
- ride bus
- play violin
- play guitar

Things to note:

- Not an exhaustive list.
- Not clearly a productive pattern, but new coinages are better than expected for me, and surprising examples can be found.
 - (7) a. ??He breeds goat for the US Army. (constructed example)
 - b. On his farm, he raises goat for meat and said there is potential for a goat dairy industry in the province. (Google)
- Exist on a scale of idiomaticity.

Properties of object BSNs in English

Cluster of properties these exhibit:

- Name well-established or institutional activity
- Noun is number neutral
- Noun doesn't introduce a discourse referent
- Restricted modification of the noun
- Restricted modification of the verb phrase

Well-established or institutional activity

Verb phrases with BSNs in English name an activity that is well-established or institutional in some sense, such as a profession or an activity with a regular, conventionalized way of carrying it out.

- (8) a. He **drives school bus** for Kenowa Public Schools to earn money for tuition. (Google)
- b. She **waits table** at Tony's and tries to keep her spirits up despite her problems. (Google)
- c. He **teaches college** in Rhode Island and at the state prison.

Well-establishedness/stereotypicality can be a possible meaning with bare plural noun phrases as well, but is not obligatory:

- (9) He drives school buses for fun.

Noun is number neutral

The noun in object BSNs is interpreted as number neutral.

- (10) She drives bus for a living...
 - a. and she always drives the same bus.
 - b. and she drives a different bus for every route.

- (11) He waits table to support his acting career...
 - a. and (, weirdly,) the restaurant he works at only has one table.
 - b. and the restaurant he works at has thirty tables.

Noun doesn't introduce discourse referent

The noun in object BSNs does not introduce a discourse referent.

- (12) John drives truck_{*i*} for a living. *It_{*i*} is large/has 18 wheels/is painted red.
- (13) She teaches school_{*i*}. *It_{*i*} has over 300 students.
- (14) *She waits table_{*i*} at Tony's, where they_{*i*} are large and round.

Modification of the noun

Modification of the noun in object BSNs is difficult. Difficult to find true attributive modifiers (rather than compounds).

- (15)
- a. *drive large truck
 - b. *drive slow bus
 - c. *ride crowded bus
 - d. *wait round table

Modification of the verb phrase

Some temporal adverbials are possible with VPs with object BSNs.

- (16) a. She waited table for ten years.
- b. Ron is driving bus today, but he'll be available tomorrow for a consultation.

However, short periods of time are less acceptable.

- (17) a. ??He drove bus for an hour.
- b. ??She waited table for twenty minutes.

As are some spatial modifiers, and manner modifiers in general.

- (18) a. ??She drives truck on I-75.
 - b. ?He teaches school in that building.
- (19) *He drives truck fast/quickly/slowly/carefully

Summary of properties

Cluster of properties these exhibit:

- Name well-established or institutional activity
- Noun is number-neutral
- Weak referentiality
- Decreased modification of both VP and noun itself.

Background

Frame semantics

- Adopt a version of Düsseldorf frame semantics, a framework for (among other things) structured meanings (Löbner 2014, 2017, Petersen 2007: a.o.).
- A frame is a recursive attribute-value structure.
 - ▶ Values are typed in a type hierarchy, a hierarchical arrangement of types (i.e., the type **dog** is a subtype of **animal**).
 - ▶ Frame attributes are functional. An attribute can have only a single value for any particular holder. (In more traditional semantic terms, attributes are type $\langle e, e \rangle$.)
 - ▶ One value within a frame is distinguished as the “central node,” which provides the type of the frame.
- Frame composition via unification.
- Representable using predicate logic, frame diagrams (directed graphs), or attribute-value matrices.
- Example:

$$(20) \quad \llbracket \textit{John gave the red flower to Mary} \rrbracket = \lambda e \left[\begin{array}{l} \mathbf{give}(e) \quad \wedge \\ \mathbf{AGENT}(e) = \mathbf{j} \quad \wedge \\ \mathbf{GOAL}(e) = \mathbf{m} \quad \wedge \\ \mathbf{THEME}(e) = \mathbf{f} \quad \wedge \\ \mathbf{red}(\mathbf{COLOR}(\mathbf{THEME}(e))) \end{array} \right]$$

Social ontology

- A social ontology provides for social entities: persons and institutions, roles, offices, functions, actions by social agents (e.g. voters, politicians, police, parents, spouses, teachers, and such).
- Essential are social acts performed by social agents that produce social facts by acting, implementing social roles, and so on.
- Entities in the social ontology are (ultimately) implemented by entities in a physical ontology (e.g., “brute facts,” Searle (1995)).
 - ▶ Persons are implemented by human animals.
 - ▶ Social acts are implemented by doings that (under appropriate circumstances) count as particular social acts (Searle 1995), a point also raised by Goldman (1970).
- The social ontology is grounded by and dependent on the physical ontology.
- Searle’s “counts as” relation (“X counts as Y in context C”) relates abstract social facts to brute facts.
- Similarly, Goldman’s notion of “level-generation” relates non-basic acts to basic acts (e.g., raising one’s hand level generates asking a question in the circumstances of being in a classroom).

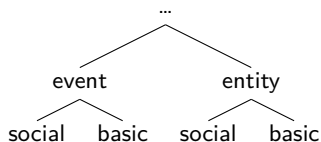
Anderson & Löbner's (2018) social ontology

- Anderson & Löbner (2018): Interested in how roles are distinguished from the individuals inhabiting the role (such as *president*).
- Argue that language distinguishes between **social individuals/events** and **basic individuals/events**.
- Manifest in linguistic descriptions of individuals and events. Some descriptions have a dual nature (*president* refers to both office and holder), while others (*presidential*) fix the interpretation to only the social level.

(21) ??a presidential visit to the president's mother/Disney/the barber

Social ontology

The distinction between social and basic individuals is inherent in the type hierarchy.



Social-level events are events in their own right, with their own attributes, including thematic role attributes. Both social and basic level events/individuals in the model, but distinguished via their type.

Mapping between levels

How to relate levels to each other? Two mappings (partially derived from Löbner (2019)):

(22) **Upward Mapping (level-generation)**

C-CONST(F_1, F_2) just in case F_1 counts as F_2 , and the central node of F_2 is a social-level entity/event.

(23) **Downward Mapping**

IMPL(x, i) $\stackrel{\text{def}}{=} \iota y. y$ implements x at time i

- C-CONST is a generalization of Searle's collective intentionality and Goldman's level generation; true just in case an individual described by a frame can be recategorized as an individual in a second, social-level frame.
- Importantly, C-CONST is not a frame attribute, but an asymmetric, transitive relation between frames.
- IMPL is a two-place attribute that relates a frame value (such as an event or individual) to another value that implements it at a particular time.
- Maps an abstract individual/event (not necessarily a kind) to another individual/event.

Mapping between levels: Examples

Supposing a *US president* frame where p is the social individual corresponding to the president of the United States (e.g., the office):

- (24) a. $\text{IMPL}(p, 2019) = \mathbf{trump}$
b. $\text{IMPL}(p, 2015) = \mathbf{obama}$

Or supposing an abstract (social-level) *playing chess* event c , IMPL maps to events that implement the playing of the game.

- (25) a. $\text{IMPL}(c, t_0) = \iota e.\mathbf{move}(e) \wedge \mathbf{AGENT}(e) = \mathbf{white} \wedge \mathbf{GOAL}(e) = e4 \wedge \dots$
b. $\text{IMPL}(c, t_1) = \iota e.\mathbf{move}(e) \wedge \mathbf{AGENT}(e) = \mathbf{black} \wedge \mathbf{GOAL}(e) = e5 \wedge \dots$

Taken the other direction, the totality of physical chess moves on a chess board by two players c -constitutes ($C\text{-CONST}$) playing chess.

Social ontology: grounding principle

- Social entities and events do not have independent existence.
- They must be implemented by basic entities and events (“brute facts” in the terminology of Searle (1995)).
- Abstract individuals and events are read off of the physical facts of the world.

(26) **Grounding Principle**

All social-level individuals/events must have a basic-level entity as their implementation, or it must be possible to construct a chain of implementing individuals/events ending in a basic-level entity.

Analysis

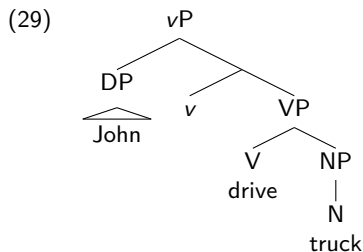
Pseudo-incorporation

- Analyze English object BSNs as a case of pseudo-incorporation.
- Pseudo-incorporated noun is not syntactically incorporated (no compounding of N and V), but still has a tight semantic connection with the verb.
- Example languages include Hindi (Dayal 2003, 2015), Niuean (Massam 2001), Catalan and Spanish (Espinal & McNally 2011), and Hungarian (Farkas & de Swart 2003). (See Borik & Gehrke 2015 for an overview.)
- Incorporated and pseudo-incorporated nouns have similar properties as English object BSNs
 - ▶ number-neutral,
 - ▶ non-referential and discourse opaque,
 - ▶ VPs with pseudo-incorporated nouns often name institutionalized activities

Case study: *drive truck*

- Use *drive truck* as a case study.
 - Meaning of *drive truck* more clearly based on its parts than other examples.
 - Alternates with bare plurals and nouns with articles more than other examples.
- (27) a. drive truck
b. drive trucks
c. drive the truck
- (28) a. ??tend bars
b. ??wait the table

Pseudo-incorporation of the noun



- Take the noun/NP as merging as the complement of the verb.
- Lack of Num and D projections; no plural, low referentiality.
- External argument generated in the specifier of functional projection over VP (Kratzer 1996)

Pseudo-incorporation of the noun

- Noun and verb denote frames, given here as first-order formulas. Partial frames for *drive* and *truck*:

$$(30) \quad \begin{array}{l} \text{a. } \llbracket \textit{drive} \rrbracket = \lambda e. \mathbf{drive}(e) \wedge \mathbf{vehicle}(\mathbf{VEHICLE}(e)) \wedge \dots \\ \text{b. } \llbracket \textit{truck} \rrbracket = \lambda x. \mathbf{truck}(x) \wedge \dots \end{array}$$

- Type **truck** is a subtype of **vehicle**. (Presupposed in the type hierarchy.)
- These frames combine via frame unification, and not Function Application (as in traditional formal semantic theories).
- Frame unification looks for compatible type information in the frames for *drive* and *truck*.
- As the type **truck** is a subtype of the type **vehicle** in the frame for *drive*, the central node of *truck* unifies with the value of the **VEHICLE** attribute of *drive*.

$$(31) \quad \llbracket \textit{drive truck} \rrbracket = \lambda e. \mathbf{drive}(e) \wedge \mathbf{truck}(\mathbf{VEHICLE}(e)) \wedge \dots$$

Pseudo-incorporation as modification

(31) $\llbracket \textit{drive truck} \rrbracket = \lambda e. \mathbf{drive}(e) \wedge \mathbf{truck}(\mathbf{VEHICLE}(e)) \wedge \dots$

- Pseudo-incorporation simply contributes a property specification to a value in the verbal frame.
- Pseudo-incorporation is not argument saturating in this analysis. Adds type information as a modifier would.
- Other analyses of the pseudo-incorporated noun also view it as contributing a property (type $\langle e, t \rangle$). Some examples include Farkas & de Swart (2003), Dayal (2003), Dobrovie-Sorin et al. (2006), Chung & Ladusaw (2004), and Espinal & McNally (2011).
- Upshot: this is the default behavior in this framework. No special rules of application (such as Predicate Modification or Restrict) required.

Accounting for institutionalized interpretation

Adding a type specification to a frame value doesn't account for the institutional reading!

- Institutional reading doesn't appear to come directly from *truck* or *drive*.
- Tied to use of the bare nominal.
- Institutional meaning is an event at the social level of the ontology.
- Generated from the basic level meaning of the VP via level generation (e.g., using the C-CONST upward mapping).
- View application of C-CONST as essentially a type-shifting operation.

Level-generation

Level-generation does two things:

- Constructs a new frame, incorporating the meaning of the old frame plus adding an additional layer of social-level events/individuals.
- These individuals/events are connected to corresponding individuals/events in the previous frame via the `IMPL` mapping.
- The `C-CONST` relation relates the old frame and the new frame. (The “counts as” relation.)

Level-generation applied to *truck drive*

Level-generation takes the basic-level meaning of *truck drive* (events of driving where the vehicle is a truck) and enriches it into social-level meaning.

- New frame has as its central node social-level events of driving a truck.
- C-CONST added as a presupposition.

$$(32) \quad \llbracket [drive\ truck]^+ \rrbracket = \lambda e'_s. \begin{array}{l} \mathbf{drive}(e'_s) \wedge \mathbf{truck}(\mathbf{VEHICLE}(e'_s)) \wedge \\ \mathbf{IMPL}(e'_s) = e \wedge \mathbf{IMPL}(\mathbf{VEHICLE}(e'_s), i) = \mathbf{VEHICLE}(e) \wedge \\ \mathbf{drive}(e) \wedge \mathbf{truck}(\mathbf{VEHICLE}(e)) \wedge \dots \end{array}$$

Presupposition:

$$\text{C-CONST} \left(\begin{array}{l} \lambda e [\mathbf{drive}(e) \wedge \mathbf{truck}(\mathbf{VEHICLE}(e)) \wedge \dots], \\ \lambda e'_s \left[\begin{array}{l} \mathbf{drive}(e'_s) \wedge \mathbf{truck}(\mathbf{VEHICLE}(e'_s)) \wedge \mathbf{IMPL}(e'_s) = e \wedge \\ \mathbf{IMPL}(\mathbf{VEHICLE}(e'_s), i) = \mathbf{VEHICLE}(e) \wedge \\ \mathbf{drive}(e) \wedge \mathbf{truck}(\mathbf{VEHICLE}(e)) \wedge \dots \end{array} \right] \end{array} \right)$$

Constraints on level-generation

New frame underdetermined by semantics; linguistic conventions and context play a role in what other information is present in the frame.

- For instance, *truck drive* seems to have been conventionalized to have an attribute EMPLOYER
- Predicts not-totally-stable interpretations across cases of pseudo-incorporated nouns.
- This is what we see with both bare singular objects of verbs (*truck drive*, *ride bus*) and prepositions (*in school*, *in jail*).

Matter of convention of whether a basic-level event can generate a new level.

- *Drive dump truck* not socially conventionalized, so won't level-generate.
- Gaps based on whether there is a way of recategorizing more basic event.

Only certain events level-generate

Matter of convention which events generate different levels of meaning. This has also been noticed in connection with other cases of pseudo-incorporation. For instance,

A contrast in Danish, due to Line Mikkelsen (p.c.), is illustrative. The Danish counterpart of butcher pig is an acceptable incorporation structure but not butcher ostrich. Since ostriches are not native to Denmark, the activity of butchering them is clearly not institutionalized. (Dayal 2011: 164)

Conventionalization of level-generation explains modification

The bare noun has little potential to be modified due to the conventionalization of level-generation.

- *drive fast/red truck*, for instance, do not have any conventional activities or professions associated with them.
- In general, the best modifiers should be those that characterize a kind.
- However, difficult to find good cases of modifiers with these nominals.

Modification patterns with VP

Temporal modifiers tend to be acceptable with VPs with pseudo-incorporated nominals. This is expected since social events extend in time.

(33) drive truck today/for ten years

However, spatial modifiers are often difficult to use, and manner adverbials are also not very good, although the judgements are fuzzy.

(34) *He drives truck on I-75.

(35) *He drives truck quickly/slowly/carefully.

This can also be explained as these modifiers target attributes of the basic-level events, and these events do not level-generate the abstract event.

Explaining the core properties of pseudo-incorporation

- Unavailability of discourse anaphora: explained via a lack of explicit existential quantification over individuals of type **truck**. Relevant individuals only accessible via the network of frame attributes and never explicitly added to the set of discourse referents.
- Number neutrality: *IMPL* permits events/individuals to have different implementing events/individuals at different times.
- This also correctly predicts sloppy readings under ellipsis, since the implementing trucks are dependent on the event.

(36) John drives truck, and Mary does, too.

- Additionally, *truck* only names the property of being a truck, and never particular individuals.

Conclusion

Lingering questions

Many lingering questions. A few:

- Relation to capacities or genericity? (For instance, roles from Claudia Maienborn's talk yesterday.)
- Can this account be extended to bare nominal objects of prepositions (*in jail, at school*)?
- Or, extended to other areas, such as weak definites (*read the newspaper*)?
- Also in German? Dutch?

Conclusion

Summary:

- Called attention to a little remarked upon set of BSNs in English
- Proposed a frame analysis of pseudo-incorporation that can account for the properties of these bare nouns, by analyzing the noun as contributing a type specification for a frame value.
- Resembles previous analyses in the literature in this respect, but differs in that the semantic composition mechanism is the default mechanism within frame semantics.
- Social ontology analysis of the “institutional” interpretation of these examples, building on Anderson & Löbner 2018.
- Novel analysis of how to capture this reading.

Thank you!

This research has been supported by DFG CRC 991 “The Structure of Representations in Language, Cognition, and Science,” projects B09 and C10.

I also thank Marcin Morzycki, Jens Fleischhauer, Sven Kotowski, Berit Gehrke, Ljudmila Geist, Manfred Sailer, Martin Schäfer, Ai Taniguchi and the audience at the Modification of Complex Predications workshop for comments and discussion, and my mom for some judgements.

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