From *HAVE* to *HAVE*-verbs: relations and incorporation[1]

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Abstract

We bring together two lines of research. The first is that of so-called *HAVE*-verbs, which come with the peculiarity of allowing for bare nominal objects in a number of languages that in general impose the use of articles in argument position and don't have a generalized incorporation option. The second is that of *HAVE*, a verb that has been claimed to select (predicative) relations rather than arguments. We argue that the literature on *HAVE* provides the key to understanding why *HAVE* and *HAVE*-verbs in general behave as incorporation verbs.

Keywords

possession/relationality, incorporation, *HAVE*, Qualia Structure

1. Introduction

The goal of this paper is to combine two lines of research. The first is that of so-called *HAVE*-verbs (Borthen 2003). These are verbs like *to have*, *to buy*, *to wear*, … that come with the peculiarity of allowing for bare nominal (count) objects in a number of languages that in general impose the use of articles in argument position (unlike, e.g., Mandarin) and don't have a generalized incorporation option (unlike, e.g., Hungarian).

(1) Han hadde rød ytterfrakk. (Norwegian, Borthen 2003)
he had red coat
'He had a red coat.'

(2) Forouse frako. (Greek, Alexandropoulou 2013)
s/he-wears frock coat
'He was wearing a frock coat.'

(3) Ion are copil. (Romanian, Dobrovie-Sorin et al. 2006)
Ion has child
'Ion has a child.'

(4) Lleva sombrero. (Spanish, Espinal & McNally 2011)
s/he-wears hat
'S/he wears a hat.'

(5) M'acabo de comprar cotxe. (Catalan, Espinal & McNally 2011)
REFL.finish.1SG of buy car
'I've just bought myself a car. '

(6) Maria tem carro. (Brazilian Portuguese, Cyrino & Espinal 2011)
Maria has car
'Maria has a car.'

[1] Acknowledgements will appear here.

Previous analyses have focused on formalizing the semantic and syntactic effects *HAVE*-verbs give rise to but haven't tried to explain why *HAVE*-verbs behave the way they do. For illustration purposes, we briefly present the analysis of Espinal & McNally (2011) but the same holds for those presented in Borthen (2003) and Dobrovie-Sorin et al. (2006).

Espinal & McNally (2011) propose that *HAVE*-verbs are just like regular transitive verbs except for the fact that they can undergo a special shift that allows them to function as incorporation verbs (henceforth *IV*s). A simplified version of this shift is given in (7):

(7) **Input** λyλxλe[**V**(e)&Agent(e)=x&θ(e)=y&∃e'[**depend**(e,e')&**have**(e')&**havee**(e')=y]]

Output λPλxλe[**V**(e)&Agent(e)=x&P(θ(e))&∃e'[**depend**(e,e')&**have**(e')&**havee**(e')=θ(e)]]

where $\theta(e)$ represents the theme of event *e*

The input in (7) is that of a regular transitive verb that comes with a dimension of possession. This dimension is made explicit in the requirement that the event *e* depends on an event *e'* that is explicitly linked to a *have*-relation. The output is different in that the theme argument variable *y* of the verb has been suppressed. The only way this argument still surfaces is indirectly as $\theta(e)$.

To see that this lexical rule is not really explaining why *HAVE*-verbs behave the way they do, we simplify it further by eliminating the technical complication of theme suppression as well as the event notation and by separating the actual input and the restriction that was built into it:

(8) **Input** λyλx(**V**(y)(x))

Output λPλx∃y(**V**(y)(x)&P(y))

Restriction This rule can only be applied to *HAVE*-verbs

What (8) gives us is the basic version of the shifting rule proposed by Espinal & McNally (2011). It takes a transitive verb and turns it – through existential closure of its internal argument – into a verb that selects predicates rather than arguments. The restriction to *HAVE*-verbs in this analysis accounts for the empirical generalization that *HAVE*-verbs can function as IVs but does not explain why it's *HAVE*-verbs and not verbs like *to like* or *to see* that behave this way. Indeed, there is no intrinsic motivation for why the application of this rule should be restricted to *HAVE*-verbs. This leaves us with the question why it's *HAVE*-verbs that occur as IVs.

This question has not been treated in the literature on incorporation (see Van Geenhoven 1998, Farkas & de Swart 2003, Chung & Ladusaw 2004, Dayal 2011). This literature has mainly focused on languages that come with a general incorporation option and has consequently been able to focus on the different formal operations that can capture the phenomenon of incorporation (absorption, restriction, unification, theme suppression, etc.). In this paper, we take the discussion one step further and focus on the question why *HAVE*-verbs are more likely to occur as IVs than other verbs.

The answer comes from the second line of research we want to bring into the discussion, *viz.* the one that has focused its attention on the semantics of *HAVE* (see, e.g., Partee 1999, Landman 2004,

Saebo 2009, Xie 2014).[2] We write *HAVE* rather than *have* to indicate that we are not talking about English *have* but rather about a semantic prototype that is instantiated as *have* in English.[3] The literature on *HAVE* has characterized it as a light verb that needs the relational content of its object noun to function as a transitive verb. The upshot of this is that *HAVE* selects relational predicates and not individual arguments. A sentence like (3), e.g., doesn't mean that Ion 'owns' a child but rather that there is an individual who stands in the child relation to Ion. The simplest way to obtain this interpretation is to start from a relational predicate semantics of *copil* and to have *are* establish this relation **R** between an individual v it introduces by itself and its subject w:

(9) [[copil]] = $\lambda y \lambda x(\text{child\_of}(y)(x))$

[[are]] = $\lambda \mathbf{R} \lambda w \exists v(R(w)(v))$

where **R** is a relation of type <e,<e,t>>

[[Ion are copil]] = $\exists v(\text{child-of}(\text{Ion})(v))$

In the semantics in (9), *copil* provides the child relation whereas *are* introduces an individual while at the same time establishing the child relation between this individual and Ion. The prime insight is that *HAVE* needs the relation included in its object noun and therefore has to function as an IV. This means that – at least for *HAVE* – we have an intrinsic motivation for giving it an IV analysis.

As it stands, the analysis of *are* in (9) is straightforward for (3) but fails to account for any of the other examples in (1) to (6), either because they don't contain a relational noun or because they don't involve the verb *HAVE*. Another problem is that of cross-linguistic variation: even though Romanian allows *copil* to occur bare after *are*, English doesn't:

(10) John has *(a) child.

To complicate matters further, Romanian not only allows *are* to combine with bare nominals but also with full DPs:

(11) Ion are un copil.

Ion has a child

Rather than taking these problems as arguments against unifying work on *HAVE* and on *HAVE*-verbs, we take them as challenges. Our motivation is that the light verb analysis of *HAVE* offers us a unique insight into why it selects (articleless) predicates and thus functions as an IV. The existential quantification we built into *are* can be reanalyzed in terms of theme suppression, absorption or any of the other operations that has been argued to underlie incorporation. As they all boil down to (some version of) existential quantification, we will not commit ourselves to any of the mechanisms proposed in the literature.

[2] Very similar ideas about *HAVE* can be found in the light verb literature (see, e.g., Ritter & Rosen 1997, Tantos 2008) as well as outside formal syntax/semantics (see e.g. Buck 1949, Heine 1997).

[3] The question whether *HAVE* can also take the format of *to be* + dative (as in Latin: *mihi est filius*, lit. 'to-me is son') is an interesting one but would lead us beyond the scope of this paper.

The paper can be divided into two main parts. In the first, we zoom in on *HAVE* and in the second on *HAVE*-verbs. Part one starts with a presentation of our view on non-relational (section 2) and relational (section 3) nouns, laying the foundations for our analysis of *HAVE* (section 4). This analysis is then shown to be able to meet three of the challenges raised above: to explain (i) why *HAVE* doesn't only take relational but also sortal bare nouns, (ii) why English-type languages differ from Romanian-type languages and (iii) why Romanian-type languages not only allow bare nouns but also full DPs after *HAVE*. In the second part, we show how our analysis of *HAVE* straightforwardly extends to *HAVE*-verbs, tackling the fourth and final challenge, *viz.* explaining why it's not only *HAVE* but *HAVE*-verbs in general that display incorporation behavior. In order to do so, we first introduce our assumptions about *Qualia Structure* (section 5) that serve as a basis for our semantic analysis of *HAVE*-verbs (section 6). We furthermore complement our semantics with a pragmatic component (section 7) and show that *HAVE*-verbs don't only constitute a special category in incorporation languages but also in a language like English (section 8).

2. Non-relational nouns and implicit arguments

In this section we explain how seemingly non-relational nouns can still have a relational semantics. This is a prerequisite to argue that *HAVE* selects predicates with a relational dimension. We also use this section to introduce most of the formal machinery we will be using throughout the paper. Given that we assume non-relational nouns are to be given the same type of lexical semantics in languages like English and languages like Romanian, we stick to English examples for expository reasons.

In line with the literature on Qualia Theory (see, e.g., Pustejovsky 1991), we assume nouns can come with implicit arguments next to their explicit ones. A noun like *blog*, e.g., comes – as any other one-place predicate – with an explicit, sortal, argument but also comes with at least one implicit argument, *viz.* the 'creator' argument we know from the agentive role in Qualia Theory. We will refer to this argument as a relational one as it stands in a specific relation to the sortal one. Whether all nouns come with relations in their Qualia Structure remains an empirical matter that lies beyond the scope of this paper. The basic test is to check whether the relations in question can be accessed without contextual support (Vikner & Jensen 2002).

The literature on implicit arguments is an extensive one (see, e.g., the survey in Bhatt & Pancheva 2006) but we know of little work on implicit arguments of non-eventive nouns and even less on how we should formalize these. Qualia Theory seems like the most complete theory of implicit arguments of nouns to date and below we provide a formally explicit way of conceiving them.

Formalizing implicit arguments is not an easy feat as we need to distinguish them from explicit arguments while at the same time making sure that they are grammatically present. This means we cannot simply assume one of the static representations in (12a) and (12b) but have to go for the dynamic representation in (12c):

(12) a. $[[\text{blog}]] = \lambda y \lambda x(\text{blog-created-by}(y)(x))$

b. $[[\text{blog}]] = \lambda x \exists y(\text{blog-created-by}(y)(x))$

c. $[[\text{blog}_{\text{dynamic}}]] = \lambda x \boldsymbol{\mathcal{E}} d_i(\uparrow\text{blog-created-by}(\uparrow d_i)(x))$

(12a) presents *blog* as having two explicit arguments, an unwarranted move if we want explicit and implicit arguments to be distinguished from one another. (12b), in which the relational argument has been existentially closed off, seems to do better at first but crucially doesn't allow us to exploit the relational argument because – strictly speaking – it is not grammatically present for binding purposes. (12c) is the in-between representation we need: the relational argument is existentially closed off and therefore it represents blog as a sortal (one-place) noun, but the dynamic character of the existential quantifier makes sure that it can still get bound. In what follows, we show how this works.

(12c) is cast in Dynamic Montague Grammar (Groenendijk & Stokhof 1990) in the variant proposed by Dekker (1993). While the notation might have a cryptic feel to it at first, the general format of the entry is actually very close to its more familiar static counterpart in (12b). The comparison between the two quickly reveals that $\mathcal{E}$ is the dynamic counterpart of $\exists$ and that in addition to the regular variables (*x*, *y*, …), used to define functional lambda-terms, there is a new type of variables represented by d_i where *d* stands for *discourse marker*. For our present purposes it suffices to note that the *d*s with subscripts were introduced in Dynamic Montague Grammar to make a notational difference between functional and content material. Variables that are abstracted over count as functional and will therefore always be represented by regular variables. Subscripted variables are bound by dynamic quantifiers and count as content material. The role of the up arrow in (12c) is to mark a shift from static expressions to dynamic ones. This shift is always made explicit for discourse markers and predicate constants but is left implicit for all functional material as this will have no dynamic role to play.[4]

The crucial advantage of (12c) over (12b) is that the former but not the latter allows us to bind the relational argument. This is not done by regular binding but rather by updating the information we have about the implicit argument. Formalizing information updates, in particular for existentials, has been a key motivation for dynamic semantics (see Kamp 1981, Heim 1982 for early proposals). (13) illustrates:

(13) I saw a cat. It was a brown one with white legs.

Where the first sentence of (13) tells us that there's a cat at stake, this information gets updated in the second sentence where we find out that the cat in question actually is a brown one with white legs.

Parallel to the update of the information about the cat in (13), we can also update the information we have about the blog in (14):

(14) I was recently browsing the web and I found this blog. The author was John.

Where the first sentence of (13) introduces a blog, the second sentence adds information about its implicit creator argument.

[4] The basic types in Dynamic Montague Grammar are *s*, *e*, and *t*. We will however follow Dekker (1993) in using shorthand notation where ε stands for the dynamic counterpart of *e*, and τ for the dynamic counterpart of *t*. Regular variables (*x*, *y*, …) as well as lifted discourse markers (those preceded by the up arrow) are assumed to be of type ε throughout the paper.

The formal feature of dynamic semantics that allows us to account for information updates is that the scope of dynamic existential quantifiers extends beyond brackets and conjunctions, unlike the scope of static ones. Where the static formula in (15) contains an unbound variable (the one occurring beyond the scope of the existential quantifiers (in bold)), the dynamic formula in (16) only contains bound discourse markers given that the logic behind Dynamic Montague Grammar guarantees that (16) is equivalent to (17):

(15) $\exists x \exists y$**(blog-created-by(y)(x)&find(x)(Speaker))**&y=John

(16) $\mathcal{E}d_1\mathcal{E}d_i$**(↑blog-created-by(↑$d_i$)(↑$d_1$);↑find(↑$d_1$)(↑Speaker))**; **↑$d_i$≅John**

(17) $\mathcal{E}d_1\mathcal{E}d_i$**(↑blog-created-by(↑$d_i$)(↑$d_1$);↑find(↑$d_1$)(↑Speaker); ↑$d_i$≅John)**

Two more notational remarks: ';' and '≅' stand for the dynamic counterparts of '&' and '=' respectively, and the distinction between discourse markers with roman and arabic subscripts reflects the difference between implicit and explicit existentially closed off arguments (Dekker 1993).

We can also put this dynamic machinery to work to turn implicit relational arguments explicit, an operation we dub *explicitation – EXPL* for short – and that will play a crucial role in the rest of this paper. The intuitive gist of the proposal is to add a silent *of him* behind a noun like *blog* where *him* stands for an argument that still needs to be bound. Dynamically, this effect is obtained through the introduction of an equation between the implicit relational argument and a new variable that is abstracted over. The result of explicitation for *blog* is spelled out in (18):

(18) $[[\text{EXPL}(\text{blog}_{\text{dynamic}})]] = \lambda y \lambda x \mathcal{E}d_i(\uparrow\text{blog-created-by}(\uparrow d_i)(x); \uparrow d_i \cong y)$

Blog in (18) is no longer a simple sortal (one-place) expression but has been turned into a relational (two-place) expression. One of the applications for this operation is to make nouns like *blog* compatible with prenominal genitives that are standardly assumed to require explicitly relational expressions as input. We spell out the semantics we assume for *John's* in (19) and work out its composition with (18) in (20):[5]

(19) $[[\text{John's}_{\text{dynamic}}]] = \lambda R_{<\varepsilon,<\varepsilon,\tau>>} \iota d_1(R(\uparrow\text{John})(\uparrow d_1))$

(20) $[[\text{John's}_{\text{dynamic}}\ \text{blog}]] =$

$\lambda R_{<\varepsilon,<\varepsilon,\tau>>} \iota d_1(R(\uparrow\text{John})(\uparrow d_1))$ $\quad$ $\lambda x \mathcal{E}d_i(\uparrow\text{blog-created-by}(\uparrow d_i)(x))$

(explicitation of *blog*)

$(\lambda y \lambda x \mathcal{E}d_i(\uparrow\text{blog-created-by}(\uparrow d_i)(x); \uparrow d_i \cong y))$

(λ-conversion) $\iota d_1(\lambda y \lambda x \mathcal{E}d_i(\uparrow\text{blog-created-by}(\uparrow d_i)(x); \uparrow d_i \cong y)(\uparrow\text{John})(\uparrow d_1))$

(λ-conversion) $\iota d_1(\mathcal{E}d_i(\uparrow\text{blog-created-by}(\uparrow d_i)(\uparrow d_1); \uparrow d_i \cong \uparrow\text{John}))$

[5] For details about the types we assume, see fn. 4. The type of R in (19) is that of a dynamic relational expression.

What *John's blog* ends up referring to is the unique blog d_1 that was created by someone d_i who is identical to John. Statically, this can be reduced to (21):

(21) ιx(blog-created-by(John)(x))

(21) refers to the unique blog whose creator is John, the desired interpretation.

Now that the use of explicitation is introduced, we can look at its formal definition:

(22) [[EXPL(P)]]= **$\lambda x \lambda y(P(y); \uparrow d_n \cong x)$** for any one-place predicate P including the implicit argument d_n where *n* ranges over *i*, *ii*, *iii*, *iv*, …

The core part of the definition (in bold) is straightforward in that explicitation is said to take a one-place predicate and to introduce an equation between an implicit argument contained in the latter and a new variable that is abstracted over. The less central parts of the definition are there to make sure that the operation comes with the necessary restrictions. We, e.g., want explicitation only to apply to nouns that come with implicit arguments. It's to obtain this effect that we use different subscripts for implicit and explicit arguments (*cf. supra*). The former get roman numbers, the latter arabic ones. By requiring P to include a discourse marker with a roman number we then effectively restrict the application of explicitation to expressions containing implicit arguments. The other restriction we have built into the definition is to require the discourse marker d_n to be included in P. This makes sure that implicit arguments that have been introduced before in the discourse are disregarded in the application of explicitation. This is relevant in cases like (23):

(23) I saw a great blog this morning. I do have to admit though that Mary's blog is still the greatest.

Given that the implicit argument of *blog* in the first sentence can still be bound in the second sentence, explicitation of *blog* in the second sentence – if not restricted to implicit arguments introduced by the second instance of *blog* – could lead the second sentence to mean that Mary is a creator of the blog in the first sentence. This is of course an undesirable result. We avoid this by requiring the discourse marker that *y* is equated with to be included in *P*.

This section has introduced a way to conceive of non-relational nouns as coming with a relational dimension by formalizing relational arguments included in their Qualia Structure as implicit relational arguments. We have now focused on a single Qualia role – the agentive one – but will get back to the other roles later in this paper. We remind the reader that the question whether all nouns come with relations in their Qualia Structure remains an empirical one that lies beyond the scope of this paper. The nouns we use are such that the relations included in them are accessible without contextual support (Vikner & Jensen 2002).

3. Relational nouns and implicit arguments

In the previous section we proposed that non-relational nouns can come with implicit relational arguments and analyzed these as dynamically existentially closed off arguments. In this section, we extend this analysis to classical relational nouns, which have standardly been analyzed as two-place predicates, having both an explicit sortal and an explicit relational argument. We thus go against the standard view on relational nouns (see, e.g., Löbner 1985, de Bruin & Scha 1988 and Barker 1995).

The idea of analyzing relational nouns in English as being one-place predicates with implicit relational arguments is not new and was, e.g., already proposed by Dekker (1993).[6] The gist of the proposal is to analyze the relational argument of relational nouns like *child* as implicit relational arguments in the same way as we did for the relational arguments included in the *Qualia Structure* of nouns like *blog*. This would make (24) into the basic entry we assume for *child*:

(24) $[[\text{child}]] = \lambda x \mathcal{E} d_i(\uparrow \text{child-of}(\uparrow d_i)(x))$

The difference between nouns like *child* and *blog* now merely resides in where the information about their relational argument is stored in their lexical entry: for relational nouns, this is in their regular entry whereas for non-relational nouns, this is in their *Qualia Structure*. This is why the implicitly relational entry of *blog* does not contain the predicate *blog-of* but rather the predicate *blog-created-by*, a direct reference to the agentive role from *Qualia Structure*. For the semantic type of the nouns this difference is however irrelevant, both being one-place predicates.

Initial support for giving nouns like *blog* and *child* the same basic semantics comes from the fact that both are compatible with *of*-possessives. *Of* possessives traditionally function as a diagnostic for relational nouns, which explains the felicity of (25a) (Barker 1995). However, it is easy to construe *of* possessives with non-relational nouns as well, as illustrated by (25b):

(25) a. the child of John

b. the blog of Doctor John H. Watson

Another classical argument in favor of downplaying the relational character of relational nouns comes from the fact that relational nouns in a language like English (almost) never require the overt realization of their first argument, unlike two-place verbs (de Bruin & Scha 1988):

(26) ? I lifted.

(27) I saw a mother.

Where (26) is felt to be an incomplete sentence, no such feeling is triggered by (27), despite the fact that the first argument of *mother* (the person she's a mother of) is not realized, parallel to the first argument of *lift* (the thing/person that was lifted). The same holds for relational nouns in Romanian-type languages:

(28) ? Am ridicat.

I-have lifted

(29) Am văzut o mamă.

I-have seen a mother

[6] Dekker's proposal is to be distinguished from the one made by Hellan (1980) and the hypothetical (and rejected) proposal of Partee & Borschev (2003:89-100) in which the relationality of classical relational nouns has to be completely derived in the pragmatics. Dekker's proposal is different in the sense that relationality is included in the nouns' lexical entries.

To complete the argument, we also note that relational nouns in English- and Romanian-type languages can be opposed to relational nouns in languages like Daakaka, the latter requiring the overt realization of their relational arguments (von Prince 2012).

For other, more formally oriented arguments, we refer the reader to Le Bruyn, de Swart & Zwarts (2013a,b) where issues of compositionality are used to argue against a two-place analysis of relational nouns. These concern – among others – the interpretation of (30) and (31):

(30) [Context: Mary and Jane work in a team hired to guide young mothers through the first steps of being a mother]

Mary to Jane: Have you already taken care of your mother today?

(31) John has the only sweet brother.

The interpretation of (30) is one in which the mother that is referred to is not Jane's biological mother but the young mother she has been assigned to. On the standard assumption that *your* is like prenominal genitives in requiring a two-place relation as input, this interpretation is difficult to derive on a two-place analysis of *mother*. The reason is that there is no type mismatch between *your* and *mother* that could be held responsible for the reinterpretation of *mother* as *mother that you have been assigned to*. On a one-place analysis of *mother*, the derivation is straightforward because the type mismatch between *your* and *mother* can be exploited to derive the relevant reinterpretation.

As for (31), Le Bruyn, de Swart & Zwarts (2013a,b) show that its standard interpretation – *viz.* that John is the only person with a sweet brother – cannot be derived on a view that starts from a generalized two-place analysis of relational nouns. The problem lies in the fact that *only sweet brother* would then refer to John's only sweet brother, John being interpreted as the relational argument of *brother* in the scope of *only*. The interpretation we want is however that it does not refer to John's only sweet brother but rather to the only sweet brother in the model.[7]

On the basis of the preceding, we conclude that there is sufficient evidence to justify the exploration of a unified analysis of classical relational nouns and non-relational nouns with a relational dimension. For this paper in particular this also allows us to develop a simple unified semantics for *HAVE*, in particular by not having to deal with two possible input types (one for relational and one for non-relational nouns). Readers who prefer to think of classical relational nouns as two-place predicates are welcome to think of our one-place analysis as involving two-place predicates that have undergone an operation of detransitivization whereby their relational argument has been dynamically existentially closed off.

[7] We get back to this example in section 8 where we zoom in on the semantics of the definite article it contains. We also note that we provide a full derivation of (31) in the appendix. The analysis presented there is a semantic alternative to the pragmatic analysis provided in Le Bruyn, de Swart & Zwarts (2013a,b).

4. The semantics of *HAVE*

With our assumptions about relationality and nouns in place, we can now turn to our analysis of *HAVE*. We will first present the analysis itself and then go over the challenges we raised in the introduction.

4.1. Our analysis

The semantics we assume for *HAVE* is as follows:

(32) $\lambda P \lambda z(\mathcal{E} d_1(\text{EXPL}(P))(z)(\uparrow d_1))$

If we decompose (32) into different steps, we see that *HAVE* (i) selects a noun with an implicit relational argument, (ii) applies explicitation to it, turning it into a two place predicate with a sortal and a relational argument, (iii) adds existential quantification over the sortal argument and (iv) makes the relational argument available for the subject to bind.

To see how (32) gives the right semantics for a simple example like (33), we provide the full derivation:

(33) Ion are copil =(3) ROMANIAN

John has child

(34) [[Ion are copil]] ROMANIAN

[[Ion have child]]=

[[child]]= $\lambda x \mathcal{E} d_i(\uparrow \text{child-of}(\uparrow d_i)(x))$

[[have child]]= $\lambda P \lambda y(\mathcal{E} d_1(\text{EXPL}(P))(z)(\uparrow d_1))$ $(\lambda x \mathcal{E} d_i(\uparrow \text{child-of}(\uparrow d_i)(x)))$

(λ-application) $\lambda y(\mathcal{E} d_1(\text{EXPL}(\lambda x \mathcal{E} d_i(\uparrow \text{child-of}(\uparrow d_i)(x))))(z)(\uparrow d_1))$

(explicitation) $\lambda y(\mathcal{E} d_1(\lambda v \lambda w(\mathcal{E} d_i(\uparrow \text{child-of}(\uparrow d_i)(w)); \uparrow d_i \cong v))(z)(\uparrow d_1))$

(λ-conversion) $\lambda z(\mathcal{E} d_1(\mathcal{E} d_i(\uparrow \text{child-of}(\uparrow d_i)(\uparrow d_1)); \uparrow d_i \cong z))$

[[Ion]] = $\uparrow \text{Ion}$

[[Ion have child]] = $\lambda z(\mathcal{E} d_1(\mathcal{E} d_i(\uparrow \text{child-of}(\uparrow d_i)(\uparrow d_1)); \uparrow d_i \cong z))$ $(\uparrow \text{Ion})$

(λ-application) $\mathcal{E} d_1(\mathcal{E} d_i(\uparrow \text{child-of}(\uparrow d_i)(\uparrow d_1)); \uparrow d_i \cong \uparrow \text{Ion}))$

(statically) $\exists x(\text{child-of}(\text{Ion})(x))$

Explicitation takes care of making both the explicit argument d_1 and implicit argument d_i of *copil* available, the former is existentially closed off, the latter ends up being equated with Ion. *Ion are copil* then means that there is an individual who is a child of someone who is identical to Ion. In terms of truth conditions this boils down to saying that there is an individual that stands in the child relation to Ion, the desired interpretation.

What happens in (34) is strongly reminiscent of standard incorporation whereby the sortal argument of the noun ends up being identified with the internal argument of the verb. What makes the incorporation special here is that we are dealing with relational incorporation whereby the sortal as well as the relational argument of the noun are incorporated.

4.2. Relational and non-relational nouns

In the introduction, we pointed out that an analysis in which *HAVE* selects relational predicates gives us an interesting insight into why *HAVE* selects predicates rather than arguments. This insight is maintained in our analysis in the sense that *HAVE* requires a predicate with an implicitly relational argument. The extra perk our analysis comes with is that the original insight is no longer limited to *HAVE* combining with classical relational nouns but is extended to *HAVE* combining with non-relational nouns insofar as they come with implicitly relational arguments. This means that we are able to meet our first challenge, *viz.* to explain why the incorporation behavior of *HAVE* is not limited to classical relational nouns.

An example in which *HAVE* combines with a non-relational noun is given in (35). The end result of its semantic derivation is given in (36):

(35) Ion are blog. ROMANIAN

John has blog

(36) [[Ion are blog]] = (dynamically) $\mathcal{E}d_1(\mathcal{E}d_i(\uparrow\text{blog-created-by}(\uparrow d_i)(\uparrow d_1));\uparrow d_i \cong \uparrow\text{Ion}))$

(statically) $\exists x(\text{blog-created-by}(\text{Ion})(x))$

As expected, (36) ends up meaning that there is a blog that was created by Ion, the desired interpretation.

4.3. Cross-linguistic variation

Another challenge we set out to meet was to explain why *HAVE* does not show incorporation behavior in every language. The articleless variant of (37), e.g., is ungrammatical:

(37) John has *(a) child

We take the contrast between the Romanian and English examples to be a reflex of the well-known opposition between article and articleless languages. Romanian and English both being article languages, the opposition is a gradual one where English has generalized the projection of Ds further than Romanian. We assume this generalization is driven by syntax (cf. Chierchia 1998).

Holding syntax responsible for the obligatory appearance of the indefinite article in (37) leaves the semanticist with two tasks. The first is to show how the semantics can deal with the indefinite article, the second is to provide semantic evidence in favor of maintaining that *have* in English is an instance of *HAVE*.

4.3.1. *HAVE* and the syntax-semantics interface

The first task is an easy one as we have type-shifting to fall back on. If *HAVE* requires a predicate but receives an argument, we can rely on standard argument-to-predicate shifts to solve the type mismatch between the verb and its object. In what follows, we work out an analysis of the article variant of (37) where we use the classical *BE* type-shift to turn the argument *a child* into a predicate.

We start by providing the semantics we assume for the indefinite article:

(38) [[a]]= $\lambda Q \lambda P \mathcal{E} d_2(Q(\uparrow d_2);P(\uparrow d_2))$

(statically) $\lambda Q \lambda P \exists x(Q(x)\&P(x))$

When combined with the semantics of *child*, we obtain the result in (39):

(39) [[a child]]= $\lambda Q \lambda P \mathcal{E} d_2(Q(\uparrow d_2);P(\uparrow d_2))$ $(\lambda x \mathcal{E} d_i(\uparrow \text{child-of}(\uparrow d_i)(x)))$

(λ-application) $\lambda P \mathcal{E} d_2(\lambda x \mathcal{E} d_i(\uparrow \text{child-of}(\uparrow d_i)(x))(\uparrow d_2);P(\uparrow d_2))$

(λ-conversion) $\lambda P \mathcal{E} d_2(\mathcal{E} d_i(\uparrow \text{child-of}(\uparrow d_i)(\uparrow d_2));P(\uparrow d_2))$

(statically) $\lambda P \exists x(\exists y(\text{child-of}(y)(x)\&P(x))$

The problem we have now is that the type of *a child* is that of an argument whereas *HAVE* requires a predicate. In order to make the two compatible, we use the standard argument-to-predicate shift known as *BE* (Partee 1987). (40) gives a dynamic version of this shift and (41) works out its effect on the end result of (39).[8]

(40) $[[\text{BE}_{\text{dynamic)}}]]= \lambda \mathscr{Q}_{<<\varepsilon,\tau>,\tau>} \lambda v(\mathscr{Q}(\lambda w(w \cong v))$

(41) [[BE(a child)]]= $\lambda v(\lambda P \mathcal{E} d_2(\mathcal{E} d_i(\uparrow \text{child-of}(\uparrow d_i)(\uparrow d_2));P(\uparrow d_2))(\lambda w(w \cong v))$

(λ-conversion) $\lambda v(\mathcal{E} d_2(\mathcal{E} d_i(\uparrow \text{child-of}(\uparrow d_i)(\uparrow d_2));\uparrow d_2 \cong v))$

What (41) gives us is a one place predicate with an implicit argument d_i and one full-fledged argument d_2 which is identified with v through the *BE* type-shift. (42) works out the rest of the derivation:

(42) [[John has a child]]=

[[has a child]] = $\lambda P \lambda z(\mathcal{E} d_1(\text{EXPL}(P))(z)(\uparrow d_1))$ $(\lambda v(\mathcal{E} d_2(\mathcal{E} d_i(\uparrow \text{child-of}(\uparrow d_i)(\uparrow d_2));\uparrow d_2 \cong v)))$

(λ-application) $\lambda z(\mathcal{E} d_1(\text{EXPL}(\lambda v(\mathcal{E} d_2(\mathcal{E} d_i(\uparrow \text{child-of}(\uparrow d_i)(\uparrow d_2));\uparrow d_2 \cong v))))(z)(\uparrow d_1))$

(explicitation) $\lambda z(\mathcal{E} d_1(\lambda x \lambda y(\mathcal{E} d_2(\mathcal{E} d_i(\uparrow \text{child-of}(\uparrow d_i)(\uparrow d_2));\uparrow d_2 \cong y)));\uparrow d_i \cong x)(z)(\uparrow d_1))$

(λ-conversion) $\lambda z(\mathcal{E} d_1(\mathcal{E} d_2(\mathcal{E} d_i(\uparrow \text{child-of}(\uparrow d_i)(\uparrow d_2));\uparrow d_2 \cong \uparrow d_1));\uparrow d_i \cong z))$

[[John has a child]]= $\lambda z(\mathcal{E} d_1(\mathcal{E} d_2(\mathcal{E} d_i(\uparrow \text{child-of}(\uparrow d_i)(\uparrow d_2));\uparrow d_2 \cong \uparrow d_1));\uparrow d_i \cong z))$ $(\uparrow \text{John})$

[8] For details about the types we assume, see fn. 4. The type of $\mathscr{Q}$ in (40) is that of a dynamic quantifier.

(λ-application) $\mathcal{E}d_1(\mathcal{E}d_2(\mathcal{E}d_i(\uparrow\text{child-of}(\uparrow d_i)(\uparrow d_2));\uparrow d_2 \cong \uparrow d_1));\uparrow d_i \cong \uparrow\text{John})$

(statically) $\exists x(\text{child-of}(\text{John})(x))$

The dynamic semantics we obtain says that there are three individuals (d_1, d_2 and d_i) two of which (d_1 and d_2) are identical (the effect of the *BE* shift) and stand in the child relation to the third individual (d_i) who is identical to John. Truth-conditionally, this boils down to saying that there is an individual that stands in the child relation to John, the desired interpretation.

The above analysis of (37) shows that even though the appearance of the indefinite article is syntactically driven, the semantics is able to deal with its presence. This is due to the fact that the *BE* type-shift can apply covertly and allows us to solve the syntax-semantics asymmetry we started out with.

4.3.2. *Have* as an instantiation of *HAVE*

We now turn to our second task, *viz.* to provide semantic evidence in favor of maintaining that *have* in English is a realization of *HAVE*. We provide two arguments.

The first is that *have* in English – in the same way as *HAVE* in Romanian-type languages – comes with a definiteness restriction (see, e.g., Partee 1987, de Hoop 1996, de Swart 2001) :

(43) a. *Ion are copilul. ROMANIAN

Ion has child-the

b. *John has the child.

(44) a. *Ion are blogul. ROMANIAN

Ion has blog-the

b. *John has the blog.

(43) and (44) demonstrate that – even if there's only one child and one blog in the model – the use of the definite article is ungrammatical after *HAVE*. We take this to be due to an interplay between definites and the existential quantification we have built into *HAVE*. Standard definites presuppose the existence of their referent and we consequently assume that they are pragmatically odd in contexts like the ones created by *HAVE* in which the existence of their referent is asserted. Built-in existential quantification playing a crucial role in the incorporation behavior of *HAVE*, we take the facts in (43b) and (44b) to be crucial evidence in favor of an analysis of English *have* along the lines of *HAVE*. We are aware of the fact that *HAVE* is sometimes followed by a definite. In most cases, we assume this is due to the fact that we are dealing with another version of *HAVE*, *viz.* $HAVE_{\text{heavy}}$ (see section 4.4). In some exceptional cases, this is due to the fact that the definites are non-presuppositional (see (31) and its discussion in section 8).

The second argument for assuming *have* is an instance of *HAVE* is that *have* forces its object to take narrow scope, once more in the same way as in Romanian-type languages.

(45) a. Ion nu are soră. ROMANIAN

Ion NOT has sister

'Ion doesn't have a sister.'

b. John doesn't have a sister.

(45a) and (45b) cannot be taken to mean that there's a sister Ion/John doesn't have but only that Ion/John doesn't have a sister at all. To our knowledge, this is an old observation for (45a) (see e.g. Dobrovie-Sorin et al. 2006) but a new one for (45b). Our analysis of *HAVE* derives it because we have built existential quantification into the verb, thus making sure that *soră*/*a sister* scopes below negation. Given the importance of the role of existential quantification in our analysis, we consider the obligatory narrow scope interpretation of *a sister* in (45b) to be another important argument in favor of analyzing English *have* along the lines of *HAVE*.

4.3.3. Cross-linguistic variation and the syntax-semantics interface

In this section we have proposed to locate the difference between Romanian- and English-type languages at the level of syntax, the latter but not the former having generalized the obligatory projection of a determiner for singular count objects. We have shown how the semantics can deal with the presence of the determiner and we have argued that there is sufficient reason to maintain a unified analysis of *HAVE* in the two types of languages. We conclude that our analysis is able to meet the second challenge, *viz.* to deal with cross-linguistic variation.

4.4. Language-internal variation

Now that we have dealt with the opposition between Romanian- and English-type languages, we can look into variation internal to Romanian-type languages. As we noted in the introduction, Romanian doesn't force the object of *HAVE* to be bare:

(46) Ion are (un) copil. ROMANIAN

Ion has a child

On their standard interpretations, the article and articleless variants of (46) are truth-conditionally equivalent: both state that Ion is a parent. This follows from our analysis given that the derivation of the article variant would be identical to that of its English counterpart (see 4.3) and lead to the same end result as the articleless variant (see 4.1). The article variant has one more interpretation though, *viz.* one in which a contextually supplied relation is established between Ion and someone else's child. One possible context would be that of a card game that has the members of the Simpson family on them. The article variant of (46) could then be used to say that Ion has a card with Bart, Lisa or Maggie on it.

To derive the second reading of the article variant and its absence for the articleless variant, we assume *are* in Romanian is ambiguous between the light version of *HAVE* we have defined in 4.1. and a 'heavy' version. The crucial difference between the two is that the former selects predicates and probes the relation included in them whereas the latter selects arguments and introduces a

contextually defined relation. The semantics of $HAVE_{heavy}$ would then look as in (47). For ease of reference, we give a static version.

(47) $[[\text{HAVE}_{heavy}]] = \lambda y \lambda x(\mathbf{R}(x)(y))$

where **R** is a contextually defined relation

With the semantics of *HAVE* and $HAVE_{heavy}$ in place, the above facts follow straightforwardly. The article variant of (46) allows for *are* to be analyzed both as *HAVE* (giving rise to the *child-of* interpretation) and as $HAVE_{heavy}$ (giving rise to the card game interpretation). As for the articleless variant, having a predicate as object, it can only contain an instance of *HAVE* and consequently only gives rise to the *child-of* interpretation.[9]

The analysis developed above accounts for the fine-grained differences between the bare and DP variants of *HAVE* in Romanian. We can thus conclude that we meet our third challenge, *viz.* accounting for language-internal variation.

Two more remarks are in order about the above facts and analysis. The first is that – setting aside scope considerations – the difference in interpretation between the article and articleless variants of (46) is the first attested truth-conditional difference between *HAVE* followed by a bare noun and *HAVE* followed by a noun preceded by the indefinite article. This is relevant for the incorporation literature.

The second remark is that the paradigm presented here also offers a strong argument in favor of maintaining a difference between a light and a heavy version of *HAVE*, specifically in the light of the unifying Small Clause analyses in the literature. Saebø (2009) proposes a unified analysis of the light and heavy version of *HAVE* by postulating that the difference between the two can be reduced to the contents of an overt or covert Small Clause (henceforth *SC*). For the light version, the SC contains a covert existence predicate, accounting for the definiteness restriction of this version. For the heavy version, the SC is overt or covert and contains a predicate that is not an existence predicate, thus accounting for the absence of a definiteness restriction. For the card game interpretation of (46), this SC would probably contain a predicate like 'on a card of his'.

The unifying aspect of this analysis is attractive but maintaining it would make it impossible to account for the difference in interpretation between the article and the articleless variant of (46). The crucial problem this analysis faces is that there is no principled way of restricting the type of SC to the article or articleless variants. In particular, we don't see how an analysis that puts the light and heavy versions of *HAVE* on a par would allow an article predicate to combine with any type of overt or covert SC while restricting articleless predicates to only combine with a covert existence predicate. An analysis that maintains a distinction between the two types of *HAVE*, one probing its object for relations, the other the context, clearly fares better with the facts in (46). We note that these facts do not constitute an argument against SC analyses of *HAVE per se* (see also Iatridou 1996, Xie 2014) but only against the idea that SC analyses would allow us to maintain a unified analysis of *HAVE*.

[9] Insofar as the article variant would have a preference for the card game interpretation, we would assume this follows from the pragmatics: the stronger, stereotypical *child-of* interpretation of the article variant would be blocked by the semantically and syntactically simpler articleless variant (de Swart & Zwarts 2009).

4.5. Conclusion

In this section we have presented our analysis of *HAVE* and we have shown how it can deal with the relevant challenges we raised in the introduction. In particular, we have shown how it allows us to deal with the incorporation potential of *HAVE* with relational as well as non-relational nouns and how it can deal with cross-linguistic and language-internal variation in the realization or absence of the indefinite article for *HAVE*. Section 5 will address the final challenge, *viz.* how our analysis of *HAVE* extends to other *HAVE*-verbs.

5. From *HAVE* to *HAVE*-verbs

In section 4 we developed an analysis of *HAVE* that motivated its incorporation behavior on the basis of its lexical semantics. The question we turn to now is which other verbs this type of analysis could carry over to. Putting it differently: which other verbs do we predict to be able to behave like *HAVE*?

The question has to be qualified. If it were about verbs like *HAVE* that merely recycle the relation included in their object noun, the answer would probably be none. Under the reasonable assumption that languages are economic in that they minimize redundant lexical items, it would indeed be weird to find that languages have more than one lexical item that does little more than recycling the relation included in its object noun. The more interesting question is therefore which verbs would be predicted to be such that the relations they encode match the relations included in their objects. If such verbs exist, we could expect them to come with a full version in which they take arguments and encode a fully specified relation and in a light version in which they take predicates and depend on these to specify part of the relation.

With this particular interpretation, the question about which verbs can qualify as *HAVE*-verbs is made dependent on the question which types of relations can be expressed by nouns. Here too, some qualification is in order. Most relations expressed by classical relational nouns are fairly specific and it would probably be hard to find a verb denoting a relation that entails or is entailed by the relations included in these nouns. The lack of any real semantic content of *HAVE* seems to make it into the one verb that can specialize in combining with these relations. To identify other *HAVE*-verbs, we should consequently look into the relations that can come with non-relational nouns. One such relation is the creator relation that we identified for *blog* on the basis of its agentive role within *Qualia Theory*. In this section, we will further explore *Qualia Theory* as a general theory of implicit relational arguments and end with a list of the relations we expect non-relational nouns to come with.

Qualia Theory is one of the constructs of Generative Lexicon Theory. The latter takes nouns in the lexicon to come with an *Argument Structure* – their regular entry – and a *Qualia Structure*. The idea behind Qualia Structure is that the lexicon should provide information about nouns that extends beyond classical entries and that this information conforms to a general format consisting of four perspectives on objects. These perspectives are known as *roles* and below we provide what we think is the most common way of presenting them with – wherever available – the implicit relational arguments they generate.

- The **formal role** specifies the position of a noun within a taxonomy. A noun like *book* could, e.g., be classified as an artifact. No implicit arguments come with this role.

- The **constitutive role** specifies what the objects denoted by the noun consist of. A book can, e.g., be said to consist of pages and a cover. The implicit arguments that can be derived from this role are those that stand in the part-of relation to the noun, the *part-of* argument.

- The **telic role** specifies what the objects denoted by the noun are designed for. A book can, e.g., be said to be designed to be read by someone. The implicit argument this role generates is the individual that will put the object denoted by the noun to its intended use, the *user* argument.

- The **agentive role** specifies the creator of the objects denoted by the noun. A book can, e.g., be said to have been written by someone. The implicit argument to be derived from this role is the individual that has created the object denoted by the noun, the *creator* argument.

Qualia Theory holds that all of the above should be included in the information the lexicon provides for nouns and empirically motivates this by facts like the ones in (48) and (49). Even though Qualia Theory was originally designed on the basis of English, the facts that motivated it carry over to other languages as well:

(48) a. John started a new book.

b. Ion a început o nouă carte.

Ion has started a new book

(49) a. I really want to buy this house but I don't like the front door.

b. Eu chiar vreau să cumpăr această casă, dar nu-mi place ușa din față.

I really want to buy this house, but NEG me pleases door-the of front

By including both the agentive and the telic role, Qualia Theory can derive the systematic ambiguity of (48a) and (48b), which can mean that John/Ion started a new book as an author/creator or as a reader/user. (49a) and (49b) demonstrate that the definite *the door*/*ușa* can be felicitous without previous mention. This follows if we assume *front door*/*ușa din față* is included in the constitutive role of *house*/*casă*.

Given that Qualia Theory hasn't been specifically designed to deal with the domain of implicit relational arguments it shouldn't come as a surprise that – as it stands – it has been claimed to be too powerful and too weak (see, e.g., Asher & Denis 2004). We use *HAVE* and prenominal genitives as our baseline for identifying relations included in nouns. For prenominal genitives, we stick to relations that can be identified out of the blue, thus making sure that we are not talking about contextually supplied relations.

An example of apparent overgeneration is provided by the oddness of (50) and (51):

(50) ?The door has a house.

(51) ?the door's house

Under the assumption that the constitutive role generates an implicit *door* argument for *house*, we would expect (50) and (51) to be felicitous – contrary to fact. We however don't take these examples to be an argument against Qualia Theory as a valid theory for implicit relational arguments. Instead,

we conjecture that the relative unacceptability of (50) and (51) is similar to the one we find in the prepositional domain for (52):

(52) ?the tree under the ant

The unacceptability of (52) is not semantic but pragmatic: in principle we locate smaller things with respect to bigger things and not the other way around. The unacceptability of (50)/(51) and (52) is not different: relating a house to a door is as pragmatically odd as locating trees with respect to ants. We conclude that (50) and (51) don't show that Qualia Theory overgenerates as a theory of implicit relational arguments but that the constitutive role simply doesn't give rise to relations that can easily be exploited by *HAVE* or prenominal genitives.

Examples where Qualia Theory would appear to undergenerate are the following:

(53) John's keys

(54) the tree's leaves

Qualia Theory – as it stands – does not provide the necessary means to interpret (53) as being about the keys that belong to John, nor to interpret (54) as being about the leaves that are part of the tree.[10] One could of course argue that these are meaning components that should be included in possessives but there's also good reason to extend Qualia Theory and to add two extra roles to Qualia Structure, the *possessor role* and the *holistic role*, giving rise to implicit arguments that are the possessors and wholes of the explicit arguments.[11]

The rationale behind enriching Qualia Structure with the possessor and the holistic role is that both generate relations that are more basic than the use relation the telic role generates. Indeed, keys are supposed to be used by people to open doors but in order for this to be possible one first has to (temporarily) possess the keys. In a similar fashion, leaves are put to work by trees to take care of photosynthesis but this is only possible if they are actually part of the tree. The holistic and possessor role can thus be seen as more basic than the telic role and this argues in favor of their inclusion in Qualia Structure.

A full overview of the roles we assume is given in (55). The ones giving rise to relations that we expect to be exploited in relational constructions are marked by an asterisk.

(55) formal
constitutive
telic*
agentive*

[10] Readers might wonder whether the constitutive role doesn't provide exactly what is needed to account for the relation in (54). This is a long-standing issue in the literature on possessives (see, e.g., Asher & Denis 2004) but crucially the constitutive role only provides parts, not wholes and can consequently not be used to link *the tree* as a whole to *leaves* (at least not on our assumption that *the tree* is binding an implicit argument provided by *leaves*).

[11] We don't exclude that the possessor and holistic role may ultimately be conflated into a single one. The intuition would be that (alienable) possession is nothing more than 'falling within the sphere' of someone (Boneh & Sichel 2010). A similar intuition underlies the use of the term *control* that is often used in the literature on possession (see, e.g., Vikner & Jensen 2002, Stassen 2009). We leave this issue for future work.

holistic*
possessor*

A small *caveat* is in place for relations probed by *HAVE*, *viz.* that *HAVE* comes with a built-in restriction to static relations. This means that a sentence like *John has a blog* can refer to John having created a blog but not to John creating a blog nor to John reading a blog, unlike *John's blog*. We leave out this complication in the rest of the paper as we see no deep reason to expect this restriction to carry over to *HAVE*-verbs in general.

In this section we have argued that identifying potential *HAVE*-verbs boils down to identifying the verbs that denote relations that match the relations non-relational nouns can denote. We have furthermore proposed to adopt a slightly adapted version of Qualia Theory as a general theory of implicit relational arguments included in non-relational nouns. Qualia Theory can thus function as the basis for our predictions about the possible extent of the class of *HAVE*-verbs.

6. *HAVE*-verbs: their identity and semantic behavior

In section 5 we argued that the class of *HAVE*-verbs is limited to those verbs that match one of the relations included in Qualia Structure:

(56) *Relations we predict HAVE*-verbs *to be able to express*

- use (<telic role): *USE*, *WEAR*, *EAT*, …

- creation (<agentive role): *BUILD*, *WRITE*, *KNIT*, …

- whole (<holistic role): *CONTAIN*, …

- possession (<possessor role): *OWN*, *LOOK FOR*, *WANT*, *NEED*…

As we indicated before, we assume all *HAVE*-verbs except *HAVE* come with some lexical content. This means they don't have to function as IVs and are also likely to have regular entries next to their incorporation entries. Whether or not verbs that fall in these classes behave as IVs consequently remains a lexical matter and cross-linguistic variation in which verbs turn out to behave as IVs cannot be excluded. The list in (56) consequently functions as an upper bound.

An overview of the different classes of *HAVE*-verbs that have been reported in the literature shows that the list in (56) makes the right predictions. Borthen (2003) points out that Norwegian possession/ownership verbs (e.g., *have*), usage verbs (e.g., *wear*), transfer of possession or ownership verbs (e.g., *receive*, *give*, *buy*) and a subclass of intensional verbs (*need*, *want*) allows for bare singular count objects. Dobrovie-Sorin et al. (2006) look into Romanian, Catalan and Spanish and mention *have* and acquisition verbs as well as some intensional and usage verbs like *to look for* and *to use*. Espinal & McNally (2011) and Borik et al. (2012) zoom in on Spanish/Catalan and Brazilian Portuguese respectively and mention the same verb classes as Dobrovie-Sorin et al. (2006). Finally, Lazaridou-Chatzigoga (2011) turns to Greek and reports that the same verbs as the ones found for Norwegian and Romance languages allow for bare objects in Greek as well. Two extra classes of verbs that have been reported to show IV behavior in Norwegian and Greek but that – up till now – haven't been categorized as *HAVE*-verbs are creation and consumption verbs (like *to build* and *to eat*) (cf. Borthen 2003, Lazaridou-Chatzigoga 2011).

Some of the verb classes reported were already exemplified in (1) to (6). Here, we provide examples of the other ones: intensional verbs (see (57) to (59)), creation verbs (see (60) to (62)) and consumption verbs (see (63)).

(57) Juan busca secretaria. (Spanish, Dobrovie-Sorin et al. 2006)

Juan looks-for secretary

(58) Per a aquest espectacle necessitareu faldilla llarga. (Catalan, Espinal 2010)

for to this event you-will-need skirt long

(59) Ion doreşte nevastă tânără. (Romanian, Dobrovie-Sorin et al. 2006)

Ion wants wife young

(60) Htizi spiti stin Costa Brava. (Greek, Lazaridou-Chatizgoga 2011)

She-is-building house in-the Costa Brava

(61) Graphi ghrama sti ghrafomihani. (Greek, Alexandropoulou 2013)

She-is-writing letter at-the typewriter.

(62) Han striker genser. (Norwegian, Borthen 2003)

He-is knitting sweater

(63) Idha mia afisa me ena emvrio pu kapnizi tsigharo. (Greek, Alexandropoulou 2013)

I-saw a poster with a fetus that smokes cigarette

It is easy to verify that *HAVE*-verbs as well as creation and consumption verbs nicely fall into the classes of verbs we expect to be able to function in the same way as *HAVE*, each of them entailing or being entailed by a relation that is generated by Qualia structure. Given that we don't predict there to be a fundamental difference between *HAVE*-verbs on the one hand and creation and consumption verbs on the other hand, we categorize all of them as *HAVE*-verbs.

To give an idea of the opposition between regular and incorporation entries, we provide these two types of entries for *OWN* and *BUILD*, two verbs that qualify as *HAVE*-verbs given the fact that they match a relation included in their object nouns. The a. versions specify their regular entries, the b. versions their incorporation entries.

(64) a. $[[OWN_{regular}]]= \lambda x \lambda y(own(x)(y))$

b. $[[OWN_{IV}]]= \lambda P \lambda z(\mathcal{E} d_1(EXPL_{possessor}(P))(z)(\uparrow d_1))$

where $EXPL_{possessor}$ stands for a special subtype of the explicitation operation that singles out the possessor argument of the input noun by requiring the relation that holds between its output arguments to be that of possession

(65) a. $[[BUILD_{regular}]]= \lambda x \lambda y(build(x)(y))$

b. $[[BUILD_{IV}]]= \lambda P \lambda z(\mathcal{E}d_1(EXPL_{creator\text{-}edifice}(P))(z)(\uparrow d_1))$

where $EXPL_{creator\text{-}edifice}$ stands for a special subtype of the explicitation operation that singles out the creator argument of the input noun by requiring the relation that holds between its output arguments to be that of creator-created and is restricted to those input nouns that have *edifice* specified in their formal role

The full versions in (64a) and (65a) take arguments and encode a fully specified relation (*own* and *build*). The IV versions in (64b) and (65b) on the other hand select predicates and probe them – through the operation of explicitation – for a relation. By resorting to subtypes of the explicitation operation based on the information in *Qualia Structure* we are furthermore able to neatly match the relation encoded by the full verb. For verbs like *BUY* and *SELL* we would of course have to make the IV versions slightly heavier than those of *OWN* and *BUILD* but the principle behind their semantic make up would be identical.

As we indicated before, we don't expect every language to have both types of entries for each verb. This is a language-specific lexical matter. What we can provide is a way to test which entries a given verb has.[12] To establish that a verb has an incorporation entry, one can simply look at whether it combines with bare nouns or not. The realization of *OWN* in Romanian, e.g., allows for bare nouns and consequently has to be assumed to have the incorporation entry in (64b):

(66) Ion posedă buletin.

Ion owns ID

To test whether a given verb also has a regular entry, one should check whether it allows its object to take wide scope over negation. The realization of *OWN* in Romanian once more qualifies:

(67) Ion nu posedă un tablou. [A cumpărat mai multe anul trecut, dar unul anume nu l-a putut găsi].

Ion not own a painting. He-has bought several year-the past, but one particular not it-has could find.

'Ion doesn't own a painting. He bought several last year, but one in particular he couldn't find.'

(67) allows for an interpretation according to which there is a particular painting Ion doesn't have, despite the fact that he does have other paintings. This is a wide scope reading of *un tablou* over *nu* and indicates that *poseda* has the regular entry in (64a).

7. *HAVE*-verbs: their pragmatic behavior

The type of incorporation associated with *HAVE*-verbs has been reported to come with a number of properties next to obligatory narrow scope of the verb's object. We briefly outline these properties, based on the work by Espinal & McNally and discuss their status.

[12] In what follows we restrict ourselves to Romanian-type languages. English-type languages will reenter the picture in section 8.

(i) Incorporated nominals have a reduced ability to allow for anaphoric pickup of the referent of their sortal argument:

(68) Avui porta faldilla$_i$. #La$_i$ hi vam regular l'any passat. (Catalan, Espinal & McNally 2011)
today she-wears skirt it her we-have given the year last
'Today she's wearing a skirt. We gave it to her as a present last year.'

(ii) Incorporated nominals have general number: they allow both for singular and plural interpretations. The possibility of a plural interpretation is illustrated in (69):

(69) Busco pis. Un a Barcelona i un a Girona. (Catalan, Espinal & McNally 2011)
I-look-for apartment one in Barcelona and one in Girona
'I'm looking for apartments. One in Barcelona and one in Girona.'

(iii) Incorporated nominals have restricted modification possibilities. We illustrate for individual-level adjectives (as opposed to kind-level adjectives):

(70) *Té parella alta/malalta. (Catalan, Espinal 2010)
he-has partner tall/ill
'He has a tall/ill partner.'

Our analysis – as it stands – predicts none of these properties. The question that imposes itself then is whether our failure to predict the above properties is a shortcoming of our analysis. We argue that rather than being a shortcoming, it is actually an advantage, as properties (i) to (iii) are not stable across languages. We refer here to the work by Lazaridou-Chatzigoga and Alexandropoulou (in changing configurations) who show that – at least for Greek – properties (i) to (iii) are not clearly attested.

For (i) they note that the exact counterpart of (68) is indeed not very felicitous but that slight variations are perfectly acceptable:

(71) Foruse pukamiso$_i$ htes. To$_i$ ihe aghorasi sti varkeloni. (Greek, Lazaridou-Chatzigoga 2011)
he-wore shirt yesterday it he-had bought in-the Barcelona
'Yesterday he had a shirt on. He had bought it in Barcelona.'

For (ii), they refer to Alexopoulou & Folli (2010) who note that (72) is infelicitous, despite the fact that it seems a simple variant of (69):

(72) Psahno aftokinito; #ena mikro ya tin poli ki ena fortighaki ya ekdhromes. (Greek, Alexopoulou & Folli 2010)
I-look-for car one small for the city and one van for trips
'I'm looking for a car; a small one for the city and a van for trips.'

For (iii) finally, they find that Greek bare nominal objects combining with IVs show no modification restrictions:

(73) Ehi psilo gomeno. (Greek, Alexopoulou & Folli 2010)
S/he-has tall boyfriend
'S/he has a tall boyfriend.'

The comparison between (68) to (70) and (71) to (73) shows that there is cross-linguistic variation in the behavior of *HAVE*-verbs. One move would then be to give up the assumption that a unified analysis is possible. We however don't think that this is a particularly insightful move and rather take the comparison to indicate that a unified analysis is possible but should not make any hard predictions about properties (i) to (iii). Our account conforms to this requirement and even comes with an extra perk, *viz.* that it allows us to understand why properties (i) to (iii) may pop up with *HAVE*-verbs. This is due to the fact that we predict the complements of *HAVE*-verbs on their article and articleless variants to have identical truth conditions. We may consequently expect a fair amount of pragmatic competition that might even end up being entrenched in some languages.

Under the standard assumption that the indefinite article flags the introduction of a new discourse referent, we expect the full DP variant to be the preferred option in all cases in which the individual corresponding to the object is pragmatically relevant. This is obviously the case if anaphoric pickup occurs (property (i)) and in all cases individual-level modification is added to the object (property (iii)). Property (ii) follows under the assumption that the indefinite article is an explicit spell-out of number that is absent from the bare noun.

In this and the previous section, we have argued that our analysis is faring well with the predictions it makes about the behavior of *HAVE*-verbs. In particular, we have seen that it makes semantic predictions about the stable property of narrow scope and pragmatic predictions about those properties that seem more variable. If these properties turn out to be stable in a given language, we can assume that some (or all) of the pragmatic properties have been entrenched and proceed to fine-tune our analysis with theme suppression as in Espinal & McNally (2011) or any of the other incorporation mechanisms that have been proposed in the literature. We have thus succeeded in proposing an analysis that brings out what is common to a number of verb classes across languages without precluding variation.

8. *HAVE*-verbs in English

In sections 5 to 7, we have argued that our analysis of *HAVE* can straightforwardly be extended to *HAVE*-verbs in general. We have however focused on Romanian-type languages and have ignored English-type languages. This should not come as a surprise given that English doesn't allow bare objects to begin with and our way of testing whether there are verbs that have an incorporation entry would consequently fail. The question that imposes itself then is whether we have any other independent evidence that allows us to assume that *HAVE*-verbs are not only special in Romanian-type languages but also in English-type languages. This type of evidence would be very welcome for an approach like ours that tries to explain the incorporation potential of *HAVE*-verbs on the basis of their lexical semantics.

In this section, we argue that *HAVE*-verbs are special in English-type languages through the study of the interaction between *HAVE*-verbs, *only* and the definite article.

In section 4.3.2. we argued that *HAVE* comes with a ban on definites that presuppose the existence of their referent. Even though (74) seems to be a counterexample, the interpretation of its negative counterpart in (75) tells us that this is not the case.[13]

[13] For completeness, we have added the full derivation of (74) in the appendix.

(74) John has the only sweet brother. (=31)

(75) John doesn't have the only sweet brother.

To our understanding, (74) states that there is a single sweet brother in the model and that it's John's. If *the only sweet brother* were presuppositional we would expect (75) to mean that there is a single sweet brother in the model but that it's not John's. This is however not the interpretation we get. Rather, (75) means that there are other people than John who also have a sweet brother. The interesting thing about (74) is consequently not that it allows for a definite after *HAVE* but rather that it allows for the definite to be non-presuppositional, in contrast to the definites we saw before:

(76) *John has the child. (=43b)

(77) *John has the blog. (=44b)

The explanation we propose is as follows. We assume – with Partee (1987) – that *the* has a presuppositional and a non-presuppositional version. By *Maximize Presupposition* we however expect the stronger presuppositional version to be the default.[14] This is exactly why we don't find sentences like (76) and (77): by *Maximize Presupposition* we expect *the child* and *the blog* to be interpreted presuppositionally, which clashes with the existential environment *HAVE* creates. The context in (74) is special though in the sense that *only* overtly marks uniqueness of the object and is therefore incompatible with the indefinite. We conjecture that this is why *Maximize Presupposition* – a pragmatic principle – can be overruled and the non-presuppositional version of the definite article becomes available. The availability of a non-presuppositional version of the definite in the object position of *HAVE* is consequently due to the interplay between *Maximize Presupposition*, the ban on presuppositional definites *HAVE* comes with and the ban on (non-maximal) indefinites imposed by *only*. [15,16] The crucial thing to take from this is that verbs that – like *HAVE* – come with built-in existential quantification are expected to allow for definites to get a non-presuppositional interpretation when they combine with *only*. If our analysis of *HAVE*-verbs is on the right track, we expect this to be one of their traceable properties.

The prediction the above makes for *HAVE*-verbs in English is that they differ from other verbs in allowing for non-presuppositional readings of definite DPs when combined with *only*.[17] This prediction is borne out. (78) to (81) give examples of verbs that belong to the class of *HAVE*-verbs, expressing a use, creation, whole or possession relation:

[14] There are several formulations of Maximize Presupposition on the market. We refer here to the one proposed by Coppock & Beaver (*submitted*).

[15] For reasons that we don't fully grasp yet, the grammaticality of (74) not only depends on the presence of *only* but also on the presence of *sweet*. This is reminiscent of an item like *any* that cannot occur in certain environments without explicit modification. The fact that *only* seems to come with a notion of widening (it allows for less pragmatic slack than definites) seems to add to the resemblance. We however have to leave this issue for future work.

[16] Our account of why *the* allows for non-presuppositional readings with *have* is close to that of Coppock & Beaver (*submitted*). In particular their characterization of *have* as a verb allowing existence to be at issue nicely corresponds to our characterization of *have* as a verb that comes with built-in existential quantification.

[17] We note that the analysis only makes predictions about English *only*. Whether or not the counterparts of *only* in other languages give rise to the same effects is an empirical matter that we leave for future research. The complication that presents itself is that there are multiple exclusives (*only*, *sole*, *unique*) that come with their own semantics (see Coppock & Beaver 2012) and need not have exact counterparts in other languages.

(78) John didn't **make** the only pie. ('other people also made a pie so there's no unique pie')
(79) This year didn't **contain** the only happy day of my life. ('other years also contained happy days so there's no unique happy day of my life')
(80) John didn't **hold** the only glass of champagne. ('other people were also holding glasses of champagne so there's no unique glass of champagne')
(81) John isn't **smoking** the only cigarette. ('other people are also smoking cigaretess so there's no unique cigarette')

The above verbs can be opposed to verbs like *to like* or *to see* that don't entail nor are entailed by relations in their object's Qualia Structure and are consequently expected not to allow for non-presuppositional readings of *the* in combination with *only*. (82) and (83) show that this prediction is borne out:

(82) #John doesn't like the only fountain in the city. ('other people also like fountains in the city so there's no unique fountain')
(83) #John didn't see the only house. ('other people also saw houses so there's no unique house')

On the basis of the opposition between the examples in (78)/(81) and (82) to (83) we conclude that we have positive evidence showing that *HAVE*-verbs have a special lexical semantics involving built-in existential quantification. This is strong support for our strategy to link their incorporation potential to their lexical semantics.

9. General Conclusion

The goal of this paper was to outline an analysis of a number of verbs that come with the peculiarity of allowing for bare nominal (count) objects in a number of languages that in general impose the use of articles in argument position and don't have a generalized incorporation option. We have built up our analysis starting from insights about *HAVE* that had been in the literature for a while but hadn't been linked to the study of incorporation. Rather than just copying an existing account of *HAVE*, we proposed a new account, developing Dekker's dynamic account of relationality and rethinking the role of Qualia Structure as a general theory of implicit relational arguments. We argued that our account of *HAVE* can furthermore be extended to other *HAVE*-verbs.

The crucial property of incorporation verbs is that they link to relations that are included in their object nouns. We proposed to model this linkage by making incorporation verbs select predicates rather than arguments. The main advantage of our analysis over previous proposals is that we are the first to answer the question why incorporation verbs behave the way they do. Indeed, where previous analyses were simply assuming *HAVE*-verbs undergo a shift that allows them to function as incorporation verbs (see , e.g., Espinal & McNally 2011), we have proposed an analysis that uses the basic lexical semantics of *HAVE*-verbs to motivate that they can behave as incorporation verbs. This allowed us to formulate falsifiable predictions about which verbs can function as incorporation verbs as well as about their stable and variable properties both in languages where they can and cannot take bare nominals.

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Appendix: **the derivation of *John has the only sweet brother*.**

We start by spelling out a dynamic version of *only* that combines with one-place predicates:

(i) $[[\text{only}]] = \lambda P \lambda x(P(x);\not\exists d_2(P(\uparrow d_2)\rightarrow\uparrow d_2\cong x))$

We now combine this with the semantics we assume for *sweet brother*:

(ii) $[[\text{sweet brother}]] = \lambda y \mathcal{E} d_i(\uparrow\text{sweet-brother-of}(\uparrow d_i)(y))$

$[[\text{only sweet brother}]] = \lambda P \lambda x(P(x);\not\exists d_2(P(\uparrow d_2)\rightarrow\uparrow d_2\cong x))(\lambda y \mathcal{E} d_i(\uparrow\text{sweet-brother-of}(\uparrow d_i)(y)))$

(λ-conversion) $\lambda x(\mathcal{E} d_i(\uparrow\text{sweet-brother-of}(\uparrow d_i)(x));\not\exists d_2(\mathcal{E} d_{ii}(\uparrow\text{sweet-brother-of}(\uparrow d_{ii})(\uparrow d_2))\rightarrow\uparrow d_2\cong x))$

(statically) $\lambda x(\exists y(\text{sweet-brother-of}(y)(x))\&\forall z(\exists v(\text{sweet-brother-of}(v)(z))\rightarrow z\cong x))$

What we have obtained now is an expression that denotes the singleton set containing the only sweet brother in the model. We now continue to let *HAVE* add existential closure over *x* and to equate d_i with *John*. The semantic contribution of *the* is spelled out in (iii) but we don't include it in the full derivation as it would trigger a further (standard) type-shift without adding anything beyond the uniqueness contribution of *only*.

(iii) $[[\text{the}_{\text{non-presuppositional}}]] = \lambda P \lambda Q \mathcal{E} d_1(P(\uparrow d_1);\not\exists d_2(P(\uparrow d_2)\rightarrow\uparrow d_2\cong\uparrow d_1);Q(\uparrow d_1))$

(iv) [[have only sweet brother]]=

$\lambda P \lambda z(\mathcal{E} d_1(\text{EXPL}(P))(z)(\uparrow d_1))\ (\lambda x(\mathcal{E} d_i(\uparrow\text{sweet-brother-of}(\uparrow d_i)(x));\not\exists d_2(\mathcal{E} d_{ii}(\uparrow\text{sweet-brother-of}(\uparrow d_{ii})(\uparrow d_2))\rightarrow\uparrow d_2\cong x)))$

$\Leftrightarrow$ (λ-conversion)

$\lambda z(\mathcal{E} d_1(\text{EXPL}(\lambda x(\mathcal{E} d_i(\uparrow\text{sweet-brother-of}(\uparrow d_i)(x));\not\exists d_2(\mathcal{E} d_{ii}(\uparrow\text{sweet-brother-of}(\uparrow d_{ii})(\uparrow d_2))\rightarrow\uparrow d_2\cong x))))(z)(\uparrow d_1))$

$\Leftrightarrow$ (explicitation)

$\lambda z(\mathcal{E} d_1(\lambda x \lambda y(\mathcal{E} d_i(\uparrow\text{sweet-brother-of}(\uparrow d_i)(y));\not\exists d_2(\mathcal{E} d_{ii}(\uparrow\text{sweet-brother-of}(\uparrow d_{ii})(\uparrow d_2))\rightarrow\uparrow d_2\cong y)));\uparrow d_i\cong x)(z)(\uparrow d_1))$

$\Leftrightarrow$ (λ-conversion)

$\lambda z(\mathcal{E} d_1(\mathcal{E} d_i(\uparrow\text{sweet-brother-of}(\uparrow d_i)(\uparrow d_1));\not\exists d_2(\mathcal{E} d_{ii}(\uparrow\text{sweet-brother-of}(\uparrow d_{ii})(\uparrow d_2))\rightarrow\uparrow d_2\cong\uparrow d_1);\uparrow d_i\cong z))$

[[John have only sweet brother]]=

$\lambda z(\mathcal{E} d_1(\mathcal{E} d_i(\uparrow\text{sweet-brother-of}(\uparrow d_i)(\uparrow d_1));\not\exists d_2(\mathcal{E} d_{ii}(\uparrow\text{sweet-brother-of}(\uparrow d_{ii})(\uparrow d_2))\rightarrow\uparrow d_2\cong\uparrow d_1);\uparrow d_i\cong z))\ \ (\uparrow\text{John})$

$\Leftrightarrow$ (λ-conversion)

$\mathcal{E} d_1(\mathcal{E} d_i(\uparrow\text{sweet-brother-of}(\uparrow d_i)(\uparrow d_1));\not\exists d_2(\mathcal{E} d_{ii}(\uparrow\text{sweet-brother-of}(\uparrow d_{ii})(\uparrow d_2))\rightarrow\uparrow d_2\cong\uparrow d_1);\uparrow d_i\cong\uparrow\text{John}))$

$\Leftrightarrow$ (statically)

$\exists x(\text{sweet-brother-of}(\text{John})(x))\&\forall y(\exists z(\text{sweet-brother-of}(z)(y))\rightarrow y=x))$

Dynamically, the meaning of *John has the only sweet brother* is that there is an individual d_1 who stands in the sweet brother relation to another individual who is identical to John. We furthermore know that there is no individual who is different from d_1 and also stands to someone in the sweet brother relation. Statically, this is equivalent to John's sweet brother being the only one in the model, the desired interpretation.

One aspect of the derivation deserves closer attention, *viz.* the explicitation step in which *x* is equated with d_i. At first sight it would seem that *x* could be equated with d_i or d_{ii}. If this were the case, one might call into question the analysis as it's only the equation with d_i that leads to the correct interpretation. Fortunately, the first impression is deceiving as d_{ii} appears in the scope of a universal operator and is consequently not available for dynamic pickup, a formal feature of Dynamic Montague Grammar that implements the intuition that the pickup attempt in (v) is infelicitous:

(v) *Every man$_i$ came. He$_i$ was happy.

This reduces the relevant candidates to just one – d_i – and makes sure our analysis gets the right result.