Unspecificity and Intensionality

Thomas Ede Zimmermann

1. Introduction

An Unexpected Birthday Present
Franzis enters a wine store. She is looking for a bottle of decent Riesling-Sylvaner.¹ “Of the twenty customers before you today, every single one bought a bottle of Cacter’s Champers to celebrate don’t-ask-me-what,” says the wine merchant. “I guess the wine is for yourself. You know what? I’ll give you two bottles for the price of one – one is for you and one is for your husband.” Now Franzis and Arnim each own a bottle of excellent white wine – to be consumed as soon as an appropriate occasion arises.

[to be continued]

I did not say where this scene is set – be it out of discretion, be it because I forgot (not to say it – but where it happened). In particular, I did not specify any particular wine store. Rather, the wine store remains unspecified. However, this does not mean that Franzis entered an unspecific wine store. In fact, assuming the story is true as told, there would have been quite a specific, particular wine store in which it took place.²

¹ I must admit that, until very recently, I used to think Riesling-Sylvaner is a blend made of Riesling and Sylvaner grapes – cf. von Stechow (1984:392, example 3) – but it is the same hybrid as Müller-Thurgau (http://www.ccf.at/wein/weisswein/sorten/riesling.htm): “Frisch, süßig, spritzig und verschen mit einem Muskatton präsentiert sich dieser RIESLING SYLVANER und kaum einer weiß, daß es ein MÜLLER-THURGAU ist.” [Fresh, palatable, crisp, and with a hint of nutmeg is how this RIESLING SYLVANER presents itself, and hardly anybody knows that it is a MÜLLER-THURGAU.] On the other hand, genetic tests have brought to light that Riesling-Sylvaner (= Müller-Thurgau) is not a hybrid of Riesling and Sylvaner (although such hybrids do exist), but probably of Riesling and Madelaine royale. I am indebted to an anonymous referee for re-opening the debate and to viniculturist Rolf Blaich of the University of Hohenheim for settling it by supplying the genetic background information.

² Could there have been more than one such store? Yes, but only one that the story would have been about. I will ignore this complication in what follows and assume that indefinite reference amounts to existential quantification. See, e.g., Dekker (to appear) for some criticism of this orthodoxy.
I did not say which bottle of wine Franzis was looking for either. However, this time, neither discretion nor forgetfulness was the reason for my omission, but love of truth: there just was no particular, specific bottle that Franzis had been looking for. She was simply looking for some bottle or other. In other words, there is no bottle of Müller-Thurgau that has been left unspecified in the second sentence of the story. Rather, what Franzis had been looking for, according to the intended and natural construal of that sentence, was an unspecific bottle of Müller-Thurgau. The difference between unspecified and unspecific objects is as important as it is well studied. The former derive from the semantics and pragmatics of indefinites, the latter are the result of the semantic interaction of a peculiar kind of verb and its (usually indefinite) object. Hence, while there may be a way of construing the object in the second sentence as relating to an unspecified bottle, there is no way of reading the first sentence as being about an unspecified shop. For unlike look for, enter does not belong to the class of unspecificity-inducing verbs; it is, as I will from now on say, (referentially) transparent, i.e., not opaque.3

The wine merchant in the above story did not tell Franzis which bottle it was that all the other customers had bought. He too had a good reason for not doing so: there just was no particular, specific bottle that each customer bought. In other words, there is no bottle of champagne that has been left unspecified by the shopkeeper. Rather, according to the intended and natural construal of the merchant’s utterance, depending on each customer there is a corresponding – specific – bottle that he or she took home. Corresponding, dependent objects are at least as well studied as unspecific objects. Usually, they are taken to be the result of one quantifier taking scope over another one. Again, while there may be a way of construing the bottle in the first sentence of the shopkeeper’s utterance as being left unspecified, there is nothing that the shop in the first sentence of the story could depend on. And there are more parallels between unspecificity and dependence. In fact, according to an influential doctrine,4 the unspecificity created by referential opacity is but a special case of scopal dependence.

I did not say which bottle of wine Franzis and Arnim own. Again the reason is obvious: there just is no particular, specific bottle that both Franzis and Arnim own (according to this story). Rather, Franzis owns one bottle of Müller-Thurgau, and Arnim owns another one. Does this mean that the bottles are, respectively, dependent on Arnim and Franzis? No: it is not true that, depending on each member of the couple, there is a corresponding – specific – bottle of Müller-Thurgau that he or she owns. For the wine merchant did not specify which of the two bottles is to be whose – and until they are somehow distributed, neither really is anybody’s. But it is still true that both Franzis and Arnim own a bottle of Müller-Thurgau. Does this mean that they each own an unspecific bottle of Müller-Thurgau? If so, own would be referentially opaque. Well, is it? It is this question the present paper is mainly concerned with.

3 The terms derive from Quine (1953), where they are used in a more general sense, though.
4 In this form the doctrine goes back to Montague (1969, 1970), but the basic idea is due to Quine (1956).
2. Setting the Stage

Let me make two basic assumptions concerning semantic analysis. The first one is a bias and may be taken as purely terminological: (i) ordinary predicates express relations between individuals. For instance, the ordinary transitive verb *kiss* expresses the binary relation of kissing, i.e., it denotes the set of ordered pairs of kissers and corresponding kissees. The second assumption is substantial and not undisputed: (ii) singular indefinites express existential quantification. For instance, the indefinite *a bottle* existentially quantifies over bottles, i.e., it denotes the set of those sets of individuals that overlap with the set of bottles (= the *extension* of *bottle*). I am making the second assumption largely for the sake of definiteness, orthodoxy, and simplicity. In particular, a dynamic view, according to which indefinites express properties, would also do for my present purposes (and may be more adequate in general), but it would complicate matters in a distracting way.

Given certain natural ways of combining meanings, the assumptions (i) and (ii) have an immediate consequence for the truth conditions of sentences of the form (*) where *x* is an individual-denoting expression (e.g., a proper name or a definite description), *R* is a transitive verb, and *N* is a singular count noun. If *R* is an ordinary transitive verb, (*) is true if, and only if, the extension of *N* overlaps the set of individuals to which the referent of *x* stands in the relation expressed by *R*. In particular, if *R* is an ordinary transitive verb, then sentences of the form (*) unequivocally support the following inferential schemata (where *M* is an arbitrary count noun):

- **Existential Impact**
  From *x Rs an N* infer: There is at least one *N*.

- **Extensionality**
  From *x Rs an N*, Every *N* is an *M*, and Every *M* is an *N* infer: *x Rs an M*.

- **Specificity**
  From *x Rs an N* infer: Some (specific) individual is Red by *x*.

The three schemata do not fully characterize ordinary transitive verbs. From a logical point of view, there may be verbs that obey each of them without being (reducible to)

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5 Existential Impact, as it is understood here, may hold even if the indefinite object fails to quantify over existing objects. As a case in point, Julius may *worship* a Greek goddess, even though goddesses (of any nationality) are mythical beings and as such do not exist. For, somewhat paradoxically, the indefinite *a Greek goddess* may be taken to denote an *existential* quantifier quantifying over *non-existent* objects – thus preserving Existential Impact. Such a view presupposes a Meinongian ontology à la Parsons (1980) or Zalta (1988); to avoid terminological hardship, one may follow the latter and distinguish Existential Impact from *Existential* Impact. In any case, I will ignore reference to Meinongian objects for the rest of this paper.

6 Extensionality implies, but is not implied by substitutivity of extensional nouns *salva veritate* (which may not be an inference schema).
binary relations between individuals. But all known counter-examples to ordinariness appear to violate at least one of the inferences. In fact, the most popular ones, seek and owe(-to-z), violate all three. Moreover – and this will become important in the sequel – the inference schemata are independent of each other. From a logical point of view, there may be verbs that violate any one (or two) of them without violating the other(s). As a matter of fact, various combinations of violations are attested. For instance, remember preserves only Specificity, whereas raise supposedly\(^7\) violates only Extensionality.

According to the standard Montagovian approach to opacity, failure of Extensionality and Specificity show in the (lowest) types of denotations of the verbs – and more specifically in the part of the types of the second (direct object) argument. If a transitive verb violates Extensionality, there must be something intensional about its argument type. And, as was mentioned above, if it violates Specificity, it would have to take scope over the indefinite object – which means that the argument type must be at least as high as that of a quantifier.

Using familiar notational devices, I will let the letters \(t\), \(e\), and \(s\) stand for the (basic) types of truth values, individuals, and situations (= world/time pairs), respectively, and have pairs \(ab\) of types indicate the type of functions from type \(a\) to type \(b\). In particular, the type of a (unary) quantifier will be \((et)t\); and whenever the extension of an expression is of some type \(a\), then its intension will be of type \(sa\). Given these conventions, the preceding paragraph boils down to this: (a) whenever a transitive verb lacks Extensionality, then the type of its second argument will contain an \(s\); and (b) whenever it violates Specificity, then that type will be at least \((et)t\). In the former case, the type in question need not start with an \(s\)\(^8\) because, e.g., for all practical purposes, the types \(s((et)t)\) and \((et)(st)\) are equivalent; in the latter case the type need not be exactly \((et)t\) because lack of Specificity may also arise when an intensional predicate takes scope over the quantifier, thus resulting in an argument type \(s((et)t)\).

It is worth pointing out that the reversals of (a) and (b) do not hold. For one thing there are (highly artificial) relations between individuals and quantifiers that satisfy Extensionality, although in general their second argument is index-dependent.\(^9\) More interestingly, there are essentially higher-order verbs that induce specificity – one of them is remember, which relates an individual \(x\) and a quantifier \(Q\) at an index \(i\) iff there is an index \(j\) before \(i\) such that the set of \(y\) individually remembered by \(x\) at \(i\) is in the extension of the quantifier at \(j\). Using type-logical notation, this truth condition may be expressed as follows:

\(^7\) … adapting the analysis of rise in Montague (1973) – rise as in Prices are rising, of course, not as in The sun is rising (for which vide Montague 1969). It should be noted that rise does satisfy extensional substitutivity (for which vide fn. 6).

\(^8\) It need not be quantificational either, as the case of rise shows, where it is simply \(se\).

\(^9\) The relation \(\lambda\lambda\lambda j \lambda x \lambda y (j \neq i \wedge Q(j)(\lambda y \bot))\) (defined using type-logical notation) is a case in point: it trivially satisfies Extensionality but can distinguish between certain co-extensional quantifiers – like \(\lambda j \lambda P(a)\) and \(\lambda j \lambda P[i = i^* \land P(a)] \lor [j \neq i^* \land P = \lambda y \bot]\) (where \(a\) and \(i^*\) are some fixed individual and index).
(R)  $(\exists j)[j < i \land Q(j)(\lambda y R(i)(x,y))]$

where $<$ is temporal precedence between (world-sharing) indices and $R$ is the relation that holds between two (specific) individuals at a given index iff, at that index, the first of them remembers the second one. If $Q$ happens to be an existential quantifier, (R) implies that there is a specific individual to which $x$ stands in the relation of remembrance;\(^{10}\) in other words, remember satisfies Specificity. At the same time, however, (R) does not render remember transparent, i.e., even if (R) is valid, there need not be a relation $S$ such that (R) is true whenever the following holds:

(S)  $Q(i)(\lambda y S(i)(x,y))$

Of course, according to (R), remember also violates Extensionality – thence the $s$ – but, judging from its Specificity behaviour, its higher-orderness may come as a surprise. On the other hand, the violation of Existential Impact shows that, on top of its intensional character, there is something odd about the verb, which is reflected by the analysis (R); for (R) implies that the quantified argument, and hence in particular its relativization,\(^{11}\) contributes its intension to the extension of the sentence. It is this shift in the relativization, then, that leads to higher-orderness despite Specificity.

To sum up the observations made so far, there is a certain match between the inference schemes considered above and the argument types of transitive verbs. The match is not perfect,\(^{12}\) but aberrant inference behaviour invariably leads to predictable type complications. The situation can be depicted by the following table:

\(^{10}\) Note that (as was already pointed out in Montague 1968) $y$ does not have to exist for $R(i)(x,y)$ to be true. In this respect remember is analogous to worship (cf. fn. 5 above) and may thus be called temporally extranuclear (adapting the terminology of Parsons 1980), thus replacing the term temporally opaque, as it was used in an earlier version of von Stechow (to appear).

\(^{11}\) The relativization of a quantifier $Q$ is that set $M$ such that $Q = D(M)$, where $D$ is a (conservative and invariant) determiner. Unlike $D$, $M$ is uniquely determined: cf. Johnsen (1987).

\(^{12}\) This need not be an imperfection of the choice of inference schemata but may also be due to the expressiveness of language. For instance, as was shown in Zimmermann (1985), transparency does not correspond to any inference scheme expressible in the PTQ fragment of Montague (1973).
Table 1: Nominal argument types of verbs

<table>
<thead>
<tr>
<th>Existential Impact + Specificity</th>
<th>Extensionality</th>
<th>Argument Type(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td>+</td>
<td>e</td>
</tr>
<tr>
<td>+</td>
<td>–</td>
<td>se</td>
</tr>
<tr>
<td>–</td>
<td>+</td>
<td>(et)t</td>
</tr>
<tr>
<td>–</td>
<td>–</td>
<td>s((et)t), ((se)t)t, s(((se)t)t)</td>
</tr>
</tbody>
</table>

The table, I take it, is self-explanatory. The three options in the last row result from an indetermination of the source of intensionality by the inference schemata. This will be of no concern in what follows. Instead, I would like to point to the penultimate row, where a failure of Existential Impact or Specificity (or both) and a simultaneous preservation of Extensionality leads to extensional higher-orderness. Given the above classification, one would clearly expect such verbs to exist. What do they look like? What would they look like? There are three cases.

Case 1: Extensional verbs that fail on both Existential Impact and Specificity are easy to imagine. Any relation $R$ between individuals and quantifiers can be turned into one by evaluating its argument at the same index as the predicate itself: $\lambda i Q_x R(i)(x, \lambda i Q(i))$. In the case of *look for* one would thus obtain a reading that licenses inferences like the following: \[ \text{Arnim is looking for a cow with white ears.} \]
\[ \text{There are no cows with white ears.} \]
\[ \text{There are no unicorns.} \]
\[ \therefore \text{Arnim is looking for a unicorn.} \]

No doubt, the first premise can be construed so as to make the inference valid – but this is a special reading (or use) of *look for* which, other things being equal, should not be explained by lexical ambiguity.\footnote{The example is inspired by an example in an earlier version of von Stechow (to appear), where the following surprising claims are made: ‘Elisabeth Engdahl once told me that she had never seen a cow with white ears and put forward the generalization that there were no such cows. For several years I tried to falsify the generalization, which I could not.’} And no verb seems to force the above inference.

Other extensional relations that defy both Specificity and Existential Impact are readily dreamed up. For instance, one may imagine a verb *aviod* which worked a bit like *avoid*, only that a sentence like *Arnim aviods a pub* would mean that there is no pub that Arnim enters. The relevant reading could be obtained using the following analysis of *aviod*: $\lambda i Q x E(i)(x, y)$, where – maybe as a result of contextual...
enrichment – $E$ denotes the relation of entering. Again, no such verb, and no other extensional, unspecific verb without Existential Impact, seems to exist.

Case 2: An extensional verb that respects Specificity but not Existential Impact seems hard to imagine. In order to see why, one may restrict attention to indefinite objects (existential quantifiers) so that an extensional relation boils down to a relation between individuals and sets (the restrictors of indefinite objects). Specificity then demands that any relation between an individual $x$ and a set $M$ is recorded by a relation between $x$ and a singleton $\{y\}$ (= the individual in the conclusion of Specificity); the problem is to make a natural choice for $y$ in case $M$ is empty – which would have to be true for at least one $x$, lest Existential Impact comes out valid. Now while such a constellation can certainly be realized by purely formal means,\(^{15}\) it is not obvious that there exist any natural, practically interesting or relevant, relations of that kind – which may ultimately explain the lexical gap.

Case 3: Finally, there ought to be extensional verbs that relate subjects to unspecific objects and at the same time guarantee Existential Impact. They are easy enough to imagine. In fact, they have been said to exist:

The following example, due to Mats Rooth, is a case in point:

(7) Mats owns 75% of the ball bearings in the basement.

(7) can be true if Mats holds a 75% share of the objects mentioned without thereby owning any particular ball bearing; it thus has a nonspecific reading in addition to the more obvious one concerning certain individual objects. On the other hand, (7) seems to allow for substitution of extensional equivalents: if the only metallic objects in the basement are ball bearings, it is obvious that (7) implies:

(8) Mats owns 75% of the metallic objects in the basement.

Zimmermann (1993:152)\(^{16}\)

As it stands, the example does not quite fit the format of the above inference schemata; but then the final sentence of the introductory story does. As expected, all of the types listed in table 1 appear to be realized by some verb or other, thus confirming the analysis of inference failure in terms of abstractness of denotation types. However, things are not that simple.

\(^{15}\) The following relation between individuals and quantifiers turns out to do the trick:

$$\exists \lambda Q \lambda x (\exists y) [B(x, y) \land (\sim Q(\lambda z \quad z = y) \lor Q = (\lambda P \quad P(y)))]\]$$

where $B$ is a (not too trivial) relation between individuals.

\(^{16}\) A footnote concerning the question of whether (7) has a specific reading has been omitted; I will address the issue in due course.
3. Extensional Ownership

An Unexpected Birthday Present [cont.]

On her way home from the wine store, Franzis meets her friend Christiane, who wants to know where she bought the two bottles. “I only bought one of them and got the other one for free,” Franzis explains. “One is for Wladimir, though.” “Which one?” asks Christiane, whereupon Franzis replies: “Whichever I choose; his is the bottle that is not mine.”

In the context of Franzis’s reply, it seems fair to read the possessives as being about possession; the content of her reply is thus preserved by the following reformulation:

(1) Arnim owns the bottle that Franzis does not own.

Franzis is not only witty in her reply, she is also right. So the paraphrase (1) of her utterance should come out as true under the circumstances; it should be assigned at least one true reading, that is. Following Mats Rooth’s suggestion, (1) ought to have two readings. On the first, specific one (1a), the definite description takes scope over the verb; on the other, unspecific reading (1b), the quantifier denoted by the description is an argument of the verb:

(1a) \(((ty: B(y) \land \neg O(f, y^*)) \land O(a, y^*))\)

(1b) \(((O(a, (ty: B(y) \land \neg O(f, y^*))))\)

Of course, (1a) is false: there are (at least) two bottles that Franzis does not own, so that (1a) already fails on the restrictor of the Russellian description. But the scope does not fare much better, at least under the (admittedly unlikely) assumption that Arnim happens to own no bottles apart from the (unspecific) one donated by the wine merchant. How about (1b), then? Since no assumptions about the precise truth-conditions induced by the unspecific use of own have been made, it may seem as if the truth of (1b) could just be stipulated, as a matter of lexical meaning: whatever the relation \(O\) may be, given the above scenario, it should relate Arnim to the quantifier denoted by the bottle that Franzis does not own. Alas, at the end of this reasoning absurdity is on the lurk. For what is that quantifier? It applies to a given set of individuals if that set contains the unique bottle that Franzis does not own; since there are (at least) two bottles Franzis does not own, the quantifier does not apply to any set. In other words, the

17 In case they are not obvious, here is a quick tour through the notational conventions employed in this section: \(t\) and \(\exists\) are the Russellian and binary existential quantifiers (determiners); \(x^*\) is [the extensional version of] Montague’s type lift, i.e., \(\lambda P \ P(x)\); and if \(Q\) is a binary quantifier, \'(Qx: \varphi)^{\prime}\) and \'(Qx: \varphi)\psi^{\prime}\) respectively abbreviate \'(Q(\lambda x\varphi)^{\prime}\) and \'(Q(\lambda x\varphi)(\lambda x\psi)^{\prime}\). Finally, it should be noted that indices have been omitted because of the purported extensionality of the construction.
quantifier denoted by *the bottle that Franzis does not own* is empty, a property it shares with the quantifier denoted by *a unicorn*, which only applies to sets that intersect with the (empty) set of unicorns. (1b) is thus materially equivalent to (2b), which is one of the two readings of (2):

\begin{enumerate}
  \item \textit{Arnim owns a unicorn.} \label{enum:arnim-own-unicorn}
  \begin{enumerate}
    \item \( (\exists y : U(y))O(a, y^*) \)
    \item \( O(a, (\exists y : U(y))) \)
  \end{enumerate}
\end{enumerate}

But, of course, (2) is not true on any reading and so, in particular, Arnim does not stand in the relation denoted by \textit{own} to the quantifier denoted by \textit{a unicorn}. In other words, (2b) is false – and hence so is (1b). According to Rooth’s suggestion, then, (1) comes out false on any reading – clearly an unwelcome consequence.

One may suspect that this inadequacy is merely a Russellian artefact: if it were not for the assumption that definite descriptions, including empty ones, denote existential quantifiers, the parallel between (1b) and (2b) might dissolve. I do not think that this reasoning holds under further scrutiny, but instead of going into this, I will show that even indefinites proper do not come out right on the proposal under discussion. For just as (1) is true under the circumstances indicated, so is (3), for which Rooth’s analysis again predicts two readings:

\begin{enumerate}
  \item \textit{Arnim owns a bottle that Franzis does not own.} \label{enum:arnim-own-bottle-franzis-doesnt-own}
  \begin{enumerate}
    \item \( (\exists y : B(y) \land \neg O(f, y^*))O(a, y^*) \)
    \item \( O(a, (\exists y : B(y) \land \neg O(f, y^*))) \)
  \end{enumerate}
\end{enumerate}

For dramatic effect, I will now assume that Franzis, like Arnim, does not own any particular bottles at all. Then the quantifier denoted by \textit{a bottle that Franzis does not own} coincides with the one expressed by \textit{a bottle}; in other words, (3) extensionally boils down to:

\begin{enumerate}
  \item \textit{Arnim owns a bottle.} \label{enum:arnim-own-bottle}
  \begin{enumerate}
    \item \( (\exists y : B(y))O(a, y^*) \)
    \item \( O(a, (\exists y : B(y))) \)
  \end{enumerate}
\end{enumerate}

(4a) is false, still assuming that Arnim owns no particular bottle. On the other hand, the extensional higher-order analysis of \textit{own} predicts that (4) should be true on its unspecific reading (4b), which means that (3b) will also be true. Now, while this may be a welcome result, it turns out that the Roothian analysis only reaches it by accident. This becomes clear by a slight shift in the example:
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(5) Arnim owns a bottle that neither Arnim nor Franzis owns.

(5a) \( \exists y : B(y) \land \neg O(a, y^*) \land \neg O(f, y^*)\)

(5b) \( O(a, \exists y : B(y) \land \neg O(a, y^*) \land \neg O(f, y^*))\)

(6) Arnim owns a bottle that Arnim owns and Franzis does not own.

(6a) \( \exists y : B(y) \land O(a, y^*) \land \neg O(f, y^*)\)

(6b) \( O(a, \exists y : B(y) \land O(a, y^*) \land \neg O(f, y^*))\)

Again, the wide scope readings (5a) and (6a) are clearly false. Moreover, given the assumption that neither Arnim nor Franzis owns any particular bottles, (5b) comes out true: the bottles owned by neither of them are all the bottles there are, and so (5b) boils down to (4b) again. This prediction may not be as inadequate as it appears at first glance. Maybe, in a sense, Arnim does own one of the two bottles that nobody – not even he himself – owns. And maybe, in the same remote and paradoxical sense, Arnim does not own a bottle that he owns – along the lines of which (6) would be false. In fact, this is the reading (6b) that the Rooth treatment of ownership predicts: there are no bottles that Arnim (specifically) owns, which is why (6b) boils down to (2b). However, the most straightforward understanding of (6), I take it, is to read it as a redundant version of (3) – and, in fact, of that reading of (3) that happens to be true. But there is no room for such a reading on the extensional higher-order analysis of \textit{own}.

One may suspect that it is not Rooth’s suggestion that is to blame but an inadequacy in the standard treatment of relative clauses. In fact the relative pronoun, being of the individual type \( e \), forces a specific reading of the verb, whereas it seems that, in the missing readings of (1), (3) and (6), the relative clause should be about unspecific ownership. The suspicion is corroborated by sentences like the following, which have been analysed as involving higher-order quantification and pronominalization:

\[ 18 \text{ Cf. Zimmermann (1993:171ff.) for an analysis along these lines in a slightly different framework.} \]

\[ 19 \text{ Restricting } Q \text{ in (8c) to existential quantifiers would be in line with the theory of unspecificity put forward in Zimmermann (1993) and employed in von Stechow (to appear), which I do not want to insist on here (because these matters are largely independent of the relation between unspecificity and intensionality). However, it should be noted that some restriction on higher-order quantifiers is needed in order to exclude quantifiers like no unicorn as instantiations of Arnim owns something.} \]

(7) Arnim is looking for something that Franzis is not looking for.

On the relevant reading, Arnim’s search is unspecific, and Franzis is said to not be engaged in a search with the same objective. The reading may be obtained by having \textit{some[thing]} quantify and the relative pronoun range over intensions of (existential) quantifiers. Along the same lines, then, (8) may be said to have a reading (8c) accord-
ing to which Arnim unspecifically owns something, whereas Franzis does not own the same unspecific object:

\[(8) \text{ Arnim owns something that Franzis does not own.} \]
\[(8a) \exists y : \neg O(f, y^*) O(a, y^*) \]
\[(8b) O(a, \exists y : \neg O(f, y^*)) \]
\[(8c) \exists Q : \neg O(f, Q) O(a, Q) \]

(8c) does have such a reading – a false one, to be sure, if Arnim and Franzis shared all their possessions apart from the two wine bottles. But then no such reading seems to be available for sentences (1), (3), and (6). For instance, (3) does not mean that there is some “bottle quantifier” to which Arnim stands in the relation of unspecific ownership, but Franzis does not.20 Moreover, even if such readings were available, they would not be the missing ones, because they would not even be true. In fact, it is not at all clear how the missing readings should be expressed in the first place, given the analysis of unspecific ownership in terms of extensional higher-order relations. In the absence of any specific proposal I conclude that, as it stands, Rooth’s suggestion cannot handle examples like (1), (3) and (6). It is time to look for an alternative.

4. Intensional Ownership

An Unexpected Birthday Present [cont.]

When Franzis arrives at the apartment, the phone is ringing. It is Arnim calling from Tübingen. She tells him about the wine merchant: “He gave me two bottles, saying that one is yours and one is mine.” “I guess,” says Arnim, “this is a clear case of Saying-so-makes-it-so.”21

Judging from the examples in the previous section, own does not seem to be extensional. A strong indication to this effect is the very fact that (6) but not (2) has a true reading although the bottles that Arnim owns extensionally coincide with the unicorns. It is therefore natural to look for an explanation in terms of an intensional analysis of own. Moreover, the mere classification of own as higher-order and intensional leaves the meaning of this verb largely underdetermined and, more specifically, it does not say in what way it contributes to the truth conditions of sentences. As it turns out, there is a rather straightforward intensional analysis that fares a lot better in these respects:

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20 To begin with, it is not even clear what it means for a quantifier to be classified as a bottle; the corresponding problem does not arise with (8) because, presumably, -thing is inclusive enough to apply to all sorts of abstract entities; cf. Moltmann (1997:20).

21 Cf. von Stechow (1982:258ff.) for more on this phenomenon.
Unspecificity and Intensionality

Verbs of ownership can in fact naturally be analyzed in terms of intensional quantifiers. On the intensional reading, such verbs plausibly involve universal quantification over certain possible situations, namely those situations which are legal and in which the object in question has been divided into concrete possessions. Moltmann (1997:50)

The legal situations presumably are those that are in accordance with some relevant contract, decree, or whatever may be constitutive of the ownership in question; in the case at hand, it was the wine merchant’s speech act, as Arnim aptly points out. Moreover, for an existential quantifier with a domain $N$ to be divided into concrete possessions presumably means that each element of $N$ is individually owned by someone. This suggests the following, slightly more precise principle:

$$(M) \quad \text{Let } x \text{ be an individual (of type } e\text{), } Q \text{ a unary quantifier (type } s((et)t)) \text{ and } i \text{ an index (s). Then the relation } R \text{ expressed by } own \text{ holds between } x \text{ and } Q \text{ at } i \text{ iff } x \text{ has a claim for possession } c \text{ at } i \text{ such that, for any index } j \text{ complying with } c, \text{ } Q \text{ is true at } j \text{ of the (characteristic function of) the set } \{y \in D_e \mid x \text{ owns } y \text{ at } j\}.$$  

The idea behind this principle is that, whatever a claim for possession may be derived from, it can be characterized by its propositional content, which must be such that ownership is limited to owners and specific, though possibly dependent objects. The wine merchant’s donation is a case in point. It establishes Arnim’s and Franzis’s claims to one of the bottles in Franzis’s bag (assuming that’s where they still are), | and ||. The indices compliant with these claims are those (or some of those) at which Arnim and Franzis each own one particular bottle of the two bottles in the bag. At some of the compliant indices, Arnim owns | and Franzis owns ||; at others Franzis owns | and Arnim owns ||; at none of them does Arnim (or Franzis) own both bottles or neither; and at none of them does Franzis (or Arnim) own an unspecific bottle. Unspecific ownership only emerges because there is no specific bottle that Arnim (or Franzis) owns at all indices that comply with their respective claims. Hence, as in the classical account of opacity, unspecificity is reduced to scopal dependence.

For future reference it will be convenient to have a formalized version of (M) at hand:

Apart from capturing the spirit of the above Moltmann quotation (I hope), principles along these lines have been suggested by Matthew Stone (at Rutgers) and Arnim von Stechow (at Starbucks).

To comply with ordinary usage, I will continue talking of Arnim’s and Franzis’s claims as though they were different. However, if claims are individuated by their contents, the two are clearly one, viz., just what the wine merchant ordered. Hence it does not really matter whose claim it is, as long as it is someone’s valid claim. The formalization will reflect this possessor-independence.

Two more notational conventions: indices appearing as subscripts are functional arguments, and the application of a unary quantifier $Q$ (of type $(et)l$) to (the characteristic function of) a set defined by an abstraction $\lambda x \phi$ is written as $(Qx)\phi$. As usual, general principles are understood as being universally closed.
Here $C$ (of type $s(st)$) denotes the property of being a (valid) claim for possession (of type $(st)$); $O$ is the relation of specific ownership. Since specific ownership is also the relation $R$ denoted by own as applied to Montague-lifted individuals, (FM) has the nice consequence that one can only own a specific object if one has a claim to it.

$O_j(x, y) \leftrightarrow (\exists c)[C_j(c) \land (\forall j)[c(j) \rightarrow (Q_jy)O_j(x, y)]]$

As it stands, (FM) is still a far cry from a reduction of unspecificity to scopal dependence. For all it says, it may well be that Arnim’s claim has the form $\lambda\lambda\lambda_jRa_kyByRf_kyByjk$, i.e., that it is specified in terms of unspecific ownership. Of course, in that case, the right-hand side of (FM) would not be true of Arnim, which is clearly unwelcome. To exclude this absurdity, one would have to add an analysis of compliance or claims (or both) to the effect that an index $j$ only complies with a claim for possession if no unspecific ownership relations hold at $j$. In other words, Moltmann’s restriction to “concrete possessions” is still missing in (FM). As was already noted above, concrete possession (presumably) boils down to specific ownership, i.e., $O$. This line of reasoning leads to the following additional principle:

$(CP) \quad C_j(c) \rightarrow (\forall j)[c(j) \rightarrow [R_j(x, Q) \leftrightarrow (Q_jy)O_j(x, y)]]$

It thus turns out that there is something circular about this (largely Moltmannian) analysis of ownership. For although the details may be negotiable, it is obvious that any principle excluding unspecific ownership at claim-compliant indices would have to involve the relation $R$ of unspecific ownership. And this is where circularity is lurking: taken together, (FM) and (CP) cannot be used as explications of the meaning of own. 25

Apart from circularity, more obstacles would have to be removed to turn (FM), or anything like it, into a coherent analysis. In fact, there is reason to doubt that this is even possible. It stems from the appearance of extensionality in own, which motivated Rooth’s analysis. After all, in many cases, truth-preserving substitution of co-extensional objects under own is possible even if the verb is construed unspecifically. Arnim, for instance, owns a blue BMW (a German car) $b_w$. This is a case of specific ownership, established by some contract $c_w$. According to the intensional analysis of own, the following formula should thus be true at a present and actual index $i$:

$(9) \quad (\exists y: BMW_i(y) \land Bl_i(y))[C_j(c) \land (\forall j)[c(j) \rightarrow O_j(a, y)]]$

25 Despite being inadequate analyses, the principles may still be true. Cf. Zimmermann (1999:553), for a similar case (“unspecific” transparency postulates).
Under the assumption that \( b_a \) and \( c_a \) satisfy the relevant predicates, (9) is true, provided that the contract specifies \( b_a \), which I take to be the case.\(^{26}\) So the analysis reflects the fact that (10) is true:

(10) *Arnim owns a blue BMW.*

However, does it also reflect the fact that (10) is not false? For this to be the case, (10) must not be assigned any false reading. In particular, (10) would have to be true on its non-specific reading, i.e.:

(11) \((\exists c)(C_j(c) \land (\forall j)[c(j) \rightarrow (\exists y : BMW_j(y) \land Bl_j(y))O_j(a, y)]\)

That (11) is true under the circumstances is not at all obvious: the contract specifies the marque, the chassis number, and various other details about the car, but not its colour. Hence (11) does not appear to be true in virtue of the content of \( c_a \). However, it may still be true as a result of an implicit understanding of compliance with a claim to possession. The following general principle would see to that:

\[(GP) \quad [N_j(y) \land C_j(c) \land (\forall j)[c(j) \rightarrow O_j(x, y)] \rightarrow (\forall j)[c(j) \rightarrow N_j(y)]\]

\((GP)\) says that, whenever some specific object \( y \) with property \( N \) is owned in virtue of a claim \( c \), then \( c \) specifies that – i.e., it only complies with indices at which – \( y \) has property \( N \). Apart from being ad hoc, \((GP)\) does not seem to be general enough. For the kind of reasoning that leads from Arnim’s ownership of \( b_a \) to the truth of (10) can also be applied in cases of unspecific ownership. Indeed, since the two bottles of Riesling-Sylvaner happen to be the objects in Franzis’s bag (to adapt Mats Rooth’s example), Arnim owns an object in Franzis’s bag, although the wine merchant certainly did not put it that way. However, generalizing \((GP)\) to such cases of unspecific ownership just does not work:

\([N_j(y) \land C_j(c) \land (\forall j)[c(j) \rightarrow (\exists y : N_j(y))O_j(x, y)] \rightarrow (\forall j)[c(j) \rightarrow M_j(y)O_j(x, y)]\]

This principle would have the effect that, whenever someone owns an unspecific \( N \), he or she, by virtue of the same claim, also owns an unspecific \( M \), provided that \( N \) and \( M \) are co-extensional. However, by the reasoning in the previous section, this cannot be right: if \( N \) is the property of being a bottle in Franzis’s bag and \( M \) is the property of being an \( N \) that Arnim does not own, then \( N \) and \( M \) are co-extensional; but at no index

\(^{26}\) Actually I don’t – because of general reservations about simplistic de re ascriptions – but then my qualms would only distract from the main point about the purported de dicto reading (11), which could not be corrected by a more sophisticated de re analysis (along the lines of Kaplan 1969, say).
complying with what the wine merchant said could Arnim possibly own a bottle with property $M$.

The examples also show that determining the indices (or “situations”) quantified over by the verb own is not just a matter of enriching ownership claims with factual information. For one would still need a criterion for distinguishing facts about the colour of Arnim’s car from facts about his possessions; invoking the latter would lead to familiar trouble, whereas the former appear to be harmless when it comes to establishing claims like (10). Nor is it a matter of restricting indices to actuality. For it would still be true that Arnim owns a bottle even if – God forbid – Franzis dropped them before they could ever be distributed – in which case there would be no actual situation in which Arnim eventually owns a particular bottle.27

Maybe compliance with claims for possession is a special case of counterfactuality based on similarity.28 After all, given the circumstances, (12) could be roughly paraphrased as (13), which in turn may be formalized along the lines of (14):

(12) Arnim owns a bottle of wine.
(13) If Arnim’s claim were redeemed, there would be a specific bottle of wine that Arnim owned.
(14) $(\exists c : C_i(c))(\forall j)[S_{ij}(c)(j) \rightarrow (\exists y : BW_j(y))O_j(a, y)]$

The formalization comes with an underlined restriction over counterfactual indices selecting those scenarios among the claim-compliant ones that are maximally similar to the evaluation index $i$. Given (CP), claim compliance guarantees that only indices are taken into account at which ownership relations are completely specific; and maximal similarity sees to it that everything else is left as is.

Sentence (12) does not say anything about what would have happened if the bottles had actually been distributed. Given the circumstances, such a distribution is most likely to be made by Franzis so that in the most realistic scenarios in which Arnim owns a particular one of the two bottles, he owns the bottle that Franzis handed over to him. But even given the circumstances, (12) does not imply that Arnim owns a bottle to be handed over to him by Franzis. Rather, the hypothetical distribution is to be thought of as taking place without anyone performing it. Moreover, realistically, distribution takes time. But (12) does not say that Arnim owns a future bottle. Rather, the hypothetical distribution is to be thought of as taking place at the index time. It thus seems that a peculiar similarity relation (between co-temporal indices) would have to be associated with unspecific ownership. In particular, differences in unspecific ownership

27 I am indebted to Joachim Sabel for bringing up this horror scenario.
28 I spare the reader the usual references (to Stalnaker 1968 and Lewis 1973, that is). The idea of employing the technique came up in a conversation with Arnim von Stechow; cf. fn. 23. I do not recall whether either of us defended it. I am indebted to an anonymous referee for pointing out an error in the original formulation of (14) below.
would have to weigh less than other differences. The following assumption about
claims $c$ and the underlying system $S$ of similarity spheres would have this effect:

\[(AS) \quad S_i(c) = \{j \mid P_i = P_j, \text{ for any ownership-independent } P\}\]

In (AS), the notion of ownership-independence must be taken so as to include proper-
ties like being a bottle in Franzis’s bag while at the same time excluding the property
of not belonging to Arnim. A precise definition of this notion seems hard to come by.
Here is an approximation:

\[(OI) \quad (\forall j:O_i \neq O_j)(\exists k:O_k = O_j)P_i = P_j\]

If satisfied at arbitrary indices $i$, the criterion says that arbitrary changes in (unspecific)
ownership are consistent with $P$ staying put. For instance, distributing the bottles
among Arnim and Franzis is consistent with them being the objects in Franzis’s bag,
but not with them being the objects in the bag that do not belong to Arnim.

Whatever the precise notion of similarity may be, the idea behind the counterfactual
analysis of unspecific ownership should be clear enough: it is ownership with respect
to those indices that only differ from the \textit{origo} in that all belongings have been distrib-
uted. This approach has at least two advantages:

- It can account for the appearance of extensionality in \textit{own}.
- It can handle the counter-examples to Rooth’s extensional analysis.

The first point is due to the fact that, surely, most predicates would have to come out as
ownership-independent – whatever that may turn out to be. Hence, for most predicates
it would hold that their extension at claim-compliant indices would coincide with their
actual extension (or, more precisely, their extension at the evaluation index). Conse-
quently, if two ownership-independent predicates extensionally coincide, then they will
also coincide at the indices relevant in determining unspecific ownership – which
suffices for a \textit{salva veritate} substitution.

Still, and this is the second point, not all predicates are ownership-independent. In
fact, the troublemakers of the previous section certainly are not. There are ways of
changing – i.e., specifying – ownership that necessarily affect the extension of, say, the
predicate \textit{bottle that neither Franzis nor Arnim owns}. In fact, substitution of \textit{bottle}
by this particular (co-extensional) predicate does not preserve the truth of the proposition
expressed on the counterfactual account of ownership: the claim-compliant indices are
all such that they contain a bottle that Arnim owns without containing one that he owns
but neither Franzis nor Arnim owns.

Hence, matters of circularity notwithstanding, the intensional analysis of unspecific
ownership – particularly in its counterfactual guise – clearly outperforms its exten-
sional rival. But it has its price. For it rests on the assumption that unspecific ownership
can be specified – and hence change – with everything else remaining the same. For
instance, Arnim’s unspecific ownership of a bottle of Riesling-Sylvaner is licensed by
the wine merchant’s donation, the content of which specifies certain counterfactual situations in which Arnim owns one of the bottles. These situations only differ from the actual (purported) course of events in that somehow, magically and clearly unknownst to any of the participants, the bottles have been assigned to their respective owners. Ownership, it would seem, does not supervene on any physical, let alone social, constellations. This may sound absurd. But I think it is slightly less absurd than it sounds. A detailed look at the (as yet unfinished) story may clear this up.

The story describes a possible scenario (an index) \textit{i} in which Arnim unspecifically owns one of two bottles, which means that there are scenarios \textit{j} (and \textit{k}) which are just like \textit{i} except that Arnim owns | and Franzis || (and \textit{vice versa}). Surely, \textit{i}, \textit{j}, and \textit{k} are mutually distinct, because they disagree in matters of ownership. One thing Franzis knows (in \textit{i}) is that she is not in \textit{j}: the bottles have not yet been distributed, and so Arnim does not own either of them. But, then, how does she know this? How could she know this, given the fact that \textit{i} and \textit{j} only disagree on ownership-dependent matters? The answer is strikingly simple: Franzis knows that there is not magical distribution. In other words, for Arnim to own a specific bottle, someone would have had to distribute the two bottles, which – as Franzis knows – has not happened. So Franzis can safely exclude scenarios like \textit{j} and \textit{k} – even though they are metaphysically possible and, given the special system $, strikingly similar to \textit{i}. The price to be paid for the counterfactual analysis of unspecific ownership lies in the acceptance of certain remote metaphysical possibilities.

5. Unspecifiable Ownership

\textit{An Unexpected Birthday Present [cont.]

After Arnim’s phone call Franzis takes one of the bottles out of her bag and puts it in the fridge for her dinner, leaving Arnim’s bottle on the kitchen table. [to be continued]

Now she is in the know. She knows which of the bottles belongs to Arnim and which is hers. It was her decision alright, but once she made it, the die was cast: Arnim owns | and hers is ||. The ownership relations thus are exactly as in the spontaneous distribution situation \textit{j}.

It is now tempting to go for a little Ockhamian reduction on the excessive metaphysical price by trying to eliminate unspecific ownership altogether: Couldn’t it be that Franzis had been in \textit{j}’s world all along? In other words, couldn’t it be that, of the above three indices, only \textit{j} and \textit{k} constitute real metaphysical possibilities? If so, there would be no need for an additional index \textit{i} at which the ownership is undetermined. For all she knew before her bold decision, Franzis could have been in \textit{j} or in \textit{k}. But now she

\footnote{She could be wrong about this, but I assume that she is not. One obvious consequence of this train of thought is that knowledge must be ownership-dependent – if only for its factivity.}
knows it was \( j \), not \( k \). Of course, she could have decided otherwise. But that just means that she could have been in \( k \) all along.

The metaphysical and methodological profit of this turn is not to be underestimated: no unspecific ownership, no magical distribution, no mysterious similarity correlated with an ill-understood notion of independence. The new view may cause some initial indisposition – just what is it that makes the specific ownership relations hold before distribution? – but maybe that is just a matter of sharpening intuitions and dropping habits.\(^{30}\)

What happens to unspecific ownership if there are no situations in which it holds as a relation? In a sense, it is no longer with us. In another sense, it still is. Take \( j \), the situation that Franzis was in at the beginning of the story, i.e., after being presented the bottles. At that time, (4) was true: Arnim owned one of the two bottles – on this all theories agree. However, the present minimalist approach has it that Arnim’s owning a bottle was unequivocally true, and true in virtue of him owning \(|\). Of course, no distribution had as yet taken place, which is why nobody knew, nobody could have known, that Arnim owned \(|\); on the other hand, at the time it was known to Franzis that Arnim owned either \(|\) or \(|\). So, according to this minimalist approach, Franzis’s knowledge was truly disjunctive. She was thus in a position to claim (4) without being able to specify any bottle owned by Arnim. The bottle is unspecified. Of course, this in itself does not make the ownership relation unspecific. The particular flavour of so-called unspecific ownership derives from the fact that, in the case at hand, no one could have specified the bottle owned by Arnim. It was unspecifiable, for epistemic reasons.

The principal problem of the counterfactual approach was the duplication of indices – the assumption that possible situations could differ with respect to ownership and nothing else. Unfortunately, the reduction of unspecificity to unspecifiability still suffers from the same defect, if to a lesser extent. But duplication does occur whenever, by accident, distribution does not occur. The construction of a pertinent scenario is left to the reader. The upshot is that the elimination of unspecific ownership is not the M25.\(^{31}\)

There is another, more radical reduction of unspecific ownership to unspecifiability.\(^{32}\) According to it, the wine merchant’s speech act does not establish any ownership relation. In other words, Arnim would not own any bottle – specifically or unspecifically – before Franzis picks out hers. All he has is a claim to a bottle, but that does not mean he owns one. In other words, sentence (4) would be literally and unequivocally false even after the merchant’s present. Appearances to the contrary would have to be explained, presumably pragmatically. I do not know of any such pragmatic explanation, but I guess the strategy would be to somehow re-interpret (4) as It is almost as if Arnim owned a bottle. In the absence of any specific analysis, I find the proposal hard to judge. In any case, the problems in the semantic analysis of own seem to reappear as problems with the complex predicate have a claim to.

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\(^{30}\) The reduction of de dicto to de re attitudes (Slater 1963) tends to cause the same kind of nausea – as does the epistemic approach to vagueness (Williamson 1992).

\(^{31}\) The road to Ockham, that is.

\(^{32}\) Martin Stokhof (p.c.) suggested something along these lines to me.
6. Conclusion

The driving force behind the present paper was the question of the relation between the two concepts that make up its title. According to standard semantic analysis, the two should be independent of each other, and yet empirically they appear to co-occur. However, the correlation has been called into doubt, with reference to a purported counterexample, *own*. The chief aim of the present paper was to dispel the doubt: either *own* is intensional, or else it does not give rise to unspecific readings. What remains is the correlation, and a need to explain it.

*An Unexpected Birthday Present, The End*

Arnim comes home just after midnight. He sees the bottle on the table. Franzis enters. “This is yours,” she says. “I put mine in the fridge.” “No, this is yours too. I am giving it to you. After all, it’s your birthday today. Well, then: Happy birthday to you, Franzis!”

Yes, and happy birthday to you, Arnim.33

References


33 This paper grew out of a seminar that I co-taught with Roger Schwarzschild at Rutgers University in Spring 2000. I am greatly indebted to Roger, the participants of the seminar, two anonymous referees, and especially Arnim von Stechow, who came visiting to present the above-quoted earlier version of von Stechow (to appear) and talk about all things opaque. While writing the present paper, I frequently felt the urge to call him or send him an email, which – for obvious reasons – I couldn’t do; I am sure the paper (and I) would have immensely profited from his criticism. I would like to apologize for the clumsiness of the title: *Opacity* may have been slightly better than *Unspecificity* (which even my word processor rejects), but then traditionally *opaque* and *intensional* are synonyms. Maybe I should have applied de Morgan’s Law to obtain *Specificity* or *Tensionality*. 


