Do you know what it means to miss New Orleans: More on Missing

Kjell Johan Sæbø

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Abstract

In (Zimmermann 2010), Ede screwtinizes the predicate *be missing* and proposes a definition of its meaning. Regarding unspecific readings of sentences with quantificational subjects, he considers various ways to derive them but favours a method where the quantifiers retain wide scope but their domains contain functions from worlds to individuals ("intentionalism"), the "delicate details" of which are, however, left for future research. I will try to show that there are indeed some pieces still missing from the analysis, phenomenologically and theoretically, but that once supplied, these rather serve to strengthen the case for the intentionalist over the "propositionalist" approach.

1   Introduction. Zimmermann's beamwork

The title of this contribution belies its topic: it is not really about the verb *miss* but about (*be*) *missing*, which is not just the progressive form of *miss* but a predicate of its own.[1] To be sure, the meaning of transitive-only *miss* is closely related to that of transitive *be missing*, but it has an additional emotional component, a treatment of which will be missing.[2] I will even be missing a discussion of transitive *be missing*, meaning that I will centre on the intransitive variant at the centre of attention for (Zimmermann 2010).

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[1] This predicate may seem like an adjective, but it corresponds to verbs in languages like French (*manquer*), Danish (*mangle*), German (*fehlen*), Spanish (*faltar*), Swedish (*fattas*). There is also the transitive variant of *be missing*, clearly a verb. As clearly an adjective is the variant (more or less confined to animates) that corresponds to German *vermisst*.

[2] Norwegian draws a lexical distinction between the two meanings: *savne* vs. *mangle*. There is also the less closely related meaning variant of *miss* corresponding to German *verfehlen*, not to *vermissen* or to *fehlen* with a dative argument.

According to Zimmermann, and it seems very intuitive, what it takes to be missing (from x) is (i) being in x in all the accessible worlds where x is complete (the **intensional** part) and (ii) not being in x in the actual world (the **extensional** part); sloppily, if something is missing from somewhere, it ought to be there but it isn't.

As far as proper names are concerned, this analysis is not problematic.[3]

(1)   Wolfgang is missing, though.

In Zimmermann's formalization, (1) gets the Ty2 representation (2):

(2) $[\neg \mathbf{I}_i(\mathbf{w}, x) \,\&\, (\forall j \rhd_x i)\mathbf{I}_j(\mathbf{w}, x)]$

That is: Wolfgang ($\mathbf{w}$) is not actually (i denotes the default world) in ($\mathbf{I}$) x (x is a free variable which the predicate comes with) but in all the worlds j accessible from i completing x, he is in x.[4] This captures the sense of (1): for the reunion to be complete, Wolfgang would have to be there too.

To a fair extent, the same holds for definite and indefinite descriptions, indeed, for all quantifiers: as long as they are given a specific interpretation, as suggested by (3a)–(5a), they do not create problems.

(3)   a.   In 1785, it was discovered that a diamond necklace was missing.
       b. $(\exists y)[\mathbf{D}_i(y) \,\&\, \neg \mathbf{I}_i(y, x) \,\&\, (\forall j \rhd_x i)\mathbf{I}_j(y, x)]$

(4)   a.   Many people were missing (from the funeral).
       b. $(\mathbf{M}_1 \, y : \mathbf{P}_i(y))[\neg \mathbf{I}_i(y, x) \,\&\, (\forall j \rhd_x i)\mathbf{I}_j(y, x)]$

(5)   a.   Being originally a 10-keyed oboe, most keys are missing now.
       b. $(\mathbf{M}_2 \, y : \mathbf{K}_i(y))[\neg \mathbf{I}_i(y, x) \,\&\, (\forall j \rhd_x i)\mathbf{I}_j(y, x)]$

Well, not grave problems anyway; for one thing, we must assume that Marie Antoinette's diamond necklace and the original oboe keys still exist(ed), or allow for relating $\mathbf{D}$ and $\mathbf{K}$ to past times. Secondly, the quantifiers in (4) (to the extent that *many* has a proportional reading) and (5) must be restricted to people that should have come to the funeral and keys that belong(ed) to the oboe; as Zimmermann observes, this can be achieved through a general manoeuvre of contextually restricting quantification to salient referents; in effect, the second conjunct of the scope would be copied to the restrictor.

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[3](1) was uttered at a reunion at Luigi's, in Old Mary's Pub, on 3 September 2002 in connection with the 7th Sinn und Bedeutung conference in Constance.

[4]In the utterance context sketched in footnote 3, x gets the value of Old Mary's Pub. Zimmermann is careful to point out, though, that the exact nature of the locative relation $\mathbf{I}$ is underspecified, open to contextual influences. Note that the world–world completion relation $\rhd$ with respect to x is defined in terms of a completion property $\mathbf{C}$.

As far as specific readings are concerned, then, the predicate *be missing* could be adequately analysed simply as expressing a property:

(6)   *be missing'* $= \lambda y \left[\neg \mathbf{I}_i(y, x) \, \& \, (\forall j \rhd_x i) \mathbf{I}_j(y, x)\right]$

This is not what Zimmermann does, however. In order to provide a basis for describing **unspecific** readings of (in)definite descriptions and quantifiers, he analyses *be missing* as a predicate of quantifiers in intension:

(7)   *be missing'* $= \lambda \mathcal{Q} \, (\forall j \rhd_x i) \, \mathcal{Q}_j(\lambda y \left[\neg \mathbf{I}_i(y, x) \, \& \, \mathbf{I}_j(y, x)\right])$

The specific readings (3b)–(5b) are obtained by Raising the Quantifier above the predicate. And as for unspecific readings, (7) works well for some DPs: indefinite descriptions and (other) quantifiers with symmetric determiners. (8a) gets to be – adequately – represented as (8b):

(8)   a.   One stamp is still missing (from my collection).
        b. $(\forall j \rhd_x i) \, (\exists^{=1} y)[\mathbf{S}_j(y) \, \& \, \neg \mathbf{I}_i(y, x) \, \& \, \mathbf{I}_j(y, x)]$

For other DPs, i.e., quantifiers with asymmetric, proportional determiners, (7) fails to deliver correct readings. Essentially, the second conjunct of the quantifier's scope should be part of its restrictor. This parallels the problem noted for the 'specific construals' (4b) and (5b); but while that problem could be solved, salvaging the specific readings, by appealing to a general mechanism of contextual domain restriction, the same road is, Zimmermann notes, obstructed in the context of the modal operator:

> . . . the quantifiers would have to be restricted to the objects in *x at j*. Hence, . . . appropriate quantificational domains are index-dependent, which means that the context would have to specify a property rather than just a set of objects. And it seems that this property would have to be that of being in *x*. This is quite a burden for pragmatics to carry, especially since it does not seem possible to override the restrictions.

In the absence of a general pragmatic derivation of the desired domains, one should explore alternative ways of obtaining the intended interpretations, Zimmermann concludes, sketching an alternative way on the last page or so: give the quantifiers wide scope throughout, but capture unspecific readings by letting their domains consist of **individual concepts** – functions from worlds to individuals – instead of (or in addition to) mere individuals. The purpose of the present contribution is to elaborate a bit on this approach, "the elaboration of the delicate details of" which was "left for future work".

2 Functions to things that are or ought to be there

> We speak of *the* dagger Macbeth seems to see.
> We ascribe properties to *it*. We regard it as
> a definite individual. Yet how can that be?
> [...] To solve the case of the missing dagger,
> we need only look for it in the right place.
>
> Lewis (1983: 4f.)

There is independent evidence that we sometimes refer to, or quantify over, individual concepts when we would appear to be talking about individuals, and a body of existing work that argues for this: Condoravdi et al. (2001), Aloni (2005), Zimmermann (2006), Schwager (2007), Löbner (2011) – not to forget Tichý (2004), who used the term *individual office* – to mention some. Below, I add some evidence with a direct bearing on the case at hand.

Next, I will elaborate on the idea that reference to and quantification over individual concepts under Aloni's **conceptual covers** can help model unspecific readings of descriptions and quantifiers combining with *missing*, in particular, by defending a naïve analysis: (9).

(9) $be\ missing' = \lambda\boldsymbol{y}\left[(\forall j \rhd_x i)\mathbf{I}_j(\boldsymbol{y}_j, x)\,\&\,\neg\mathbf{I}_i(\boldsymbol{y}_i, x)\right]$

Here $\boldsymbol{y}$ is a variable ranging over individual concepts. The naïvité of (9) lies mainly in the assumption that this analysis is to account for specific and unspecific uses alike, even though $\boldsymbol{y}$ ranges over individual concepts *only* – it is intended as the *one and only* analysis.

As such, it may meet challenges from various angles. First, it should be a plausible analysis of unspecific readings; there should be natural ways of conceiving the individual concepts and the conceptual covers constraining them that are at play in given cases. I discuss some intuitive cases, but also a less intuitive one, in section 2.2.

Second, it should work for specific readings as well; although these are not separate readings in any structural sense, it should be possible to isolate the factors – to do with the conceptual cover operative in a given context – that license us to infer what we could formalize as a specific interpretation. This issue is the topic of section 2.3.

Third, the observed tendency for the 'intensional part' of *missing* to be, as it were, interpreted into the restrictors of quantifiers should be explained. Here again, the contextually operative covers play a key role, along with the information structural division of the extensional and intensional part into focus and background, – as argued in section 2.4.

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In addition to the readings that Zimmermann (seriously) considers, there is the reading of *be missing* sentences with singular indefinite subjects *a P* where we infer that *no P* is there. In section 3, I concede that this forces us to supplement (9) with a **property** reading parallel to the proper treatment of opacity in certain verbs according to Zimmermann (1993).

Section 4 brings another change to (9): x becomes a syntactic argument. This argument is often missing, and if so, it acts as a free variable, as in (9). Zimmermann (2010) hints that the fact that the x argument is anaphoric if it is not saturated syntactically is predictable on the basis of Sæbø (1996), and I try to show that this is so.

Section 5 winds up the paper and puts it into perspective.

2.1   missing may be missing

A consequence of the idea that we sometimes or always refer to or quantify over functions from worlds to individuals in connection with *missing* is that nouns like *screw* and determiners like *one* must be able to shift their type, from denoting sets of individuals to denoting sets of such functions and from denoting type $((et)(et))$ relations to denoting type $(((se)t)((se)t))$ relations. It is not unnatural to assume that these shifts are brought on by **coercion**, ultimately triggered by lexical items like *be missing*.

There is evidence, however, that the reinterpretations that are involved do not require the threat of a type conflict. Consider (10) and (11a):

(10)   **One of the covers wasn't in the package** when it arrived.

(11)   a.   I took it to a local smith and he told me that **the firing pin wasn't there**.

It is easy to imagine that, for instance, the firing pin of the particular gun at issue had never existed, so that the DPs have unspecific readings here.[5] This is evidently provoked purely by pragmatic pressure, not type coercion. Since there is no modal operator, the unspecificity cannot be attributed to embedding. But if we interpret the DPs as quantifiers over sets of concepts (say, the singleton consisting of the function assigning to any world where it is defined this gun's firing pin), we seem to get the right truth conditions ($\mathbf{F}_i^+(x)$ is the singleton set of concepts 'the firing pin of x', x is the gun):

(11)   b. $(\lambda \boldsymbol{y} \, \neg \mathbf{I}_i(\boldsymbol{y}_i, x))(\iota \boldsymbol{y} \, \mathbf{F}_i^+(x)(\boldsymbol{y})) \;\equiv\; \neg \mathbf{I}_i([\iota \boldsymbol{y} \, \mathbf{F}_i^+(x)(\boldsymbol{y})]_i, x)$

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[5]True, (11a) might be analyzed in a traditional Russellian way, with negation targeting the existential entailment; (10), however, shows that this is not generally a viable option.

This is true in the sketched scenario because $\iota \boldsymbol{y}\, \mathbf{F}_i^+(x)(\boldsymbol{y})$ is undefined for i, the scenario world (so $\neg$ must be interpreted as weak negation). – Data like (10) and (11a) thus provide extra motivation for individual concepts as the sort of thing we quantify over when we talk about missing things.

2.2 Partial functions to things in x

I pursue two goals in this section: (i) add flesh to the bones of the idea that *be missing* denotes a set of individual concepts $\boldsymbol{y}$ (as this idea is primarily motivated by unspecific readings, I will concentrate on unspecific cases), (ii) confront a case in which it is not immediately evident how this notion is to be understood (that will be Zimmermann's paradigmatic IKEA case).

2.2.1 Nice cases

Consider (12a): every mailed letter is supposed to have a postage stamp on it, but here the sender has forgotten.[6]

(12) a. They may deliver it if they don't notice the stamp is missing.

One function with stamps as values stands out as salient in this situation: the function that assigns to any world where it is defined the stamp on the envelope. This function is of course undefined for worlds where (12a) is true. To be precise, it would seem as if the set of functions effectively denoted by the noun *stamp* is the singleton $\boxed{1}$:

$\boxed{1}$ $\{\lambda j$ the stamp on the envelope in j, if one there is; undefined else$\}$

This set is a suitable argument for the definite article qua **iota** operator, so that the effective denotation of *the stamp* can be characterized as $\boxed{3}$:

$\boxed{2}$ $\iota\{\lambda j$ the stamp on the envelope in j, if one there is; undefined else$\}$ =

$\boxed{3}$ λj the stamp on the envelope in j, if one there is; undefined else

Now when this individual concept is plugged into the meaning of *be missing* as given by (9), we get an interpretation of the clause *the stamp is missing* according to the following informal paraphrase:

(12) b. $\boxed{3}$ is defined for all i-accessible worlds completing the envelope but actually undefined.

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[6]Let us ignore the complication that two or more stamps can be necessary, or can fill the same function as one.

This we may view as a fair rendering of the meaning of the sentence in the context of (12a), but it would arguably be better yet if the 'intensional part' (defined for all i-accessible worlds completing the envelope) were not a truth *versus* falsity condition but a truth *or* falsity condition, a presupposition; this can be accomplished if that part is 'read into' the definite's restrictor, reducing the relevant set of functions to stamps to $\boxed{4}$, *at most* a singleton:

$\boxed{4}$ $\{f \mid f = \lambda j$ the stamp on the envelope in j, if one there is; and, for all worlds k accessible from i completing the envelope, $f(k)$ is on it in $k\}$

If due to the second constraint this set is empty, the existence presupposition of the definite fails. (12c) could illustrate this kind of situation.

(12)   c.   – Let's hope they don't notice the seal is missing.
             – Whaddya mean, the *seal* is missing – this is the 20th century!

The respondent rejects the constraint that the function 'λj the seal on the letter in j, if one there is' is defined for any k where the letter is complete.
    Let us next consider a case with an indefinite subject; now x is a page of a stamp album.

(13)   a.   A stamp is missing (from this album page).

We can visualize how the album page induces a set of individual concepts: there are, say, twenty slots there, each identifying a different type of stamp, by series, value, and an image. What *stamp* effectively denotes will contain twenty partial functions from worlds to stamp tokens, *inter alia*:

$\boxed{5}$ λj the 1953 $2\frac{1}{2}$d Coronation stamp sitting in the third slot from left in the third row in j, if there is one (undefined else)

Thus determined, these will all be defined for all worlds completing the page. But should the slot for the 1953 $2\frac{1}{2}$d Coronation stamp be empty, we would have a witness for the existential quantifier in (13a), represented as (13b):[7]

(13)   b. $(\exists\boldsymbol{y})[\mathbf{S}_i^+(\boldsymbol{y}) \,\&\, (\forall j \rhd_x i)\mathbf{I}_j(\boldsymbol{y}_j, x) \,\&\, \neg\mathbf{I}_i(\boldsymbol{y}_i, x)]$

$\boxed{5}$ is a witness verifying (13a) because it is undefined for the actual world – so (13a) is true by weak negation.

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[7]Possibly, we would also have a witness for the existential if the slot were filled by the wrong type of stamp – a 1954 40+10 Pf Bertha Pappenheim stamp, say, or a 1926 35 c Marianne stamp.

Now if what *stamp* effectively denotes is a set of 20 individual concepts, that amounts to a considerable enrichment of the (lifted) meaning of *stamp* – and it certainly does not show in the representation (13b). Here, there seem to be three conjuncts on equal footing: y must be a function to stamps, it must be a function assigning to each accessible world completing x a value in x, and it must be undefined for i or assign to i a value not in x. However, the negative variant (13c) reveals that this is not quite the way it works.

(13)   c.   No stamp is missing (from this album page).

Only exceptionally can we assert this on the grounds that there is no function mapping every accessible world completing the page to a stamp on the page – it would have to be a blank page, without any slots;[8] then we might say, humorously: 'At least there are no stamps missing from *this* page!' But on the normal understanding of (13c), the first and second conjuncts of (13b) seem to form a unit which is not 'at issue'.

In fact, we seem to normally presuppose a nicely delimited set of partial functions from worlds to individuals (members of the noun's low extension) in x, all defined for all accessible worlds which complete x. This semblance is reinforced by the ready availability of plural definite genitive phrases as determiners' arguments (although the interpretation is unspecific):

(13)   d.   One/none of the stamps is missing (from this album page).

Now if we assume that the nouns effectively denote sets of functions from worlds to individuals all of which target individuals *in x*, and all of which, moreover, assign individuals in x to all accessible 'ideal' worlds in regard to x (worlds where x is complete), it might be expected (i) that the *in x* part, though mostly implicit, could be explicit, and (ii) that adjuncts of the form *that should be in x* could figure as well. Both expectations are borne out.

(14)   Rod sometimes mentions a comic he read where Doctor Octopus stole the letter H. To illustrate the severity of this,
        all the Hs in the comic were missing.

The H's in the comic had never been there. Let us say that the first balloon in the eighth panel of page 1 of the comic reads as (15).

(15)   I ave special powers wic make me Spider-Man! Nobody else as tem!

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[8] Unless $\mathbf{S}^+$ is implicitly restricted to functions to stamps of some special kind, say, to stamps portraying Queen Elizabeth II.

We get a clear notion of the set of functions denoted by *H's in the comic*: 'λj the H at the start of the second word in the first balloon in the eighth panel of page 1 of the comic in j, if one there is; undefined else', and so on.

A finite relative clause can be used instead of these *in x* PP adjuncts – provided the finite verb is a counterfactual necessity modal:

(16)   a. #all the H's that were in the comic were missing.
        b. all the H's that should have been in the comic were missing.

In the standard case, though, the noun is not modified by a PP *in x* or a relative clause *which should be in x*, and still, it seems to effectively denote a nicely delimited set of partial functions from worlds to individuals which are in x, in fact, total functions as far as completion worlds are concerned. But then, where is the source of that set of concepts, and how does it come to enrich, or indeed to define, the (lifted) meaning of the noun?

2.2.2   The source of slots

It is reasonable to assume that the modal part of the meaning of *be missing* provides a starting point. Unspecific interpretations involve functions which may be defined for possible worlds only, and to quantify over such things, we need to take a cue from the worlds for which we can expect them to be defined. Now the possible worlds we are familiar with in connection with *be missing* are the accessible worlds where x is complete; for something to be missing from x, it must map all of those to a value in x. In connection with a predicate like *prevent* (Condoravdi et al. 2001), the possible worlds under consideration are such where certain prospects of future events are realized. Generally, we seem to base our conception of the relevant functions on what the relevant possible worlds are like; this is more or less what David Lewis alluded to (1983: 4) when he wrote that we need only to look for Macbeth's dagger in the right place.

In the album page scenario outlined above, in any world where the page is complete, there are twenty stamps on it. To be sure, that does not mean that for any such world, each stamp is the value of one of the functions, or that each function has one of the stamps as its value. And yet, both of these generalizations are evidently drawn in practical production and interpretation. In addition, the language user seems to assume that the relevant functions are 'separated' (as are functions belonging to conceptual covers, see below): no two functions assign the same value to a given argument. Then we have a one-to-one correspondence between functions and slots: the relevant domain consists of twenty and only twenty functions.

Since Aloni (2001), it has become customary to describe reference to or quantification over individual concepts relative to conceptual covers, which are contextually determined sets of concepts. Usually, a conceptual cover is modelled as a parameter of interpretation,[9] but alternatively, it could also be introduced as a free variable into a language like Ty2.

Conceptual covers help us conceptualize individual concepts. Therefore, it makes sense to attribute to them our tendency to think of such things in terms of slots, making them responsible for the radical reduction of the vast number of stamp-valued functions that are possible in principle, to twenty in the case at hand – and correspondingly in most other cases.[10]

One reductory effect comes for free if the set of stamp-valued functions ultimately forms a subset of a conceptual cover: covers are by definition sets of separated concepts, whose values never coincide. Other effects will derive from cognitive plausibility. Although we can conceive of weird functions like 'the lowest-valued indigo stamp on the page', it is cognitively more plausible to assume functions which correspond to the slots. (In other cases, of course, only position matters, as with missing panes in a matrix of windows – and in some cases, as we will see in 2.2.3, not even that seems to matter essentially.) And although the functions could in principle be undefined for all but the worlds where the page is complete, it is more natural to assume that each is also defined for worlds where, say, its value is the only stamp on the page.

2.2.3 Indiscriminate screws

To illustrate the notion of individual concepts under conceptual covers, I chose the stamp album scenario over Zimmermann's IKEA screw set scenario with care, since here, the operative set of concepts is in the public context. Each member of it is nicely delineated, giving us a clear conception of how the functions are functions and all give different values at any given world. There is a unique, stable position (slot) for each stamp in a complete album, each corresponding to a natural individual concept.

In the case of the screws that are missing from the IKEA set, by contrast, there are typically two, four, eight, or twelve screws that are exactly alike. It will not do to construct the functions from holes where the screws go, where they sit in completion worlds, for we cannot assume that in all worlds where the screw set is complete the piece of furniture will also in fact be assembled.

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[9]To be exact, in Aloni's theory the parameter is a *contextual perspective* which assigns a cover to a variable.

[10]This attribution may seem problematic against the background of Aloni's definition; I follow Dekker (2012: 64) in replacing her *total* covers by covers of subsets of the domain.

And in the bag the screws (as many as there are) are mumble-jumbled, there are no slots, and the positions in space are liable to shift during transport. According to Zimmermann, in the case under screwtiny a conceptual cover consists of methods for identifying screws, e.g. by their position, size, form; but if the language user has no clear idea of any such method, it seems to be an open question how she can confidently quantify over them.

There are ways, of course, to stipulate some methods of discrimination. Assume, for instance, that (in any world) at any given moment of time, the screws in the set (as many as there are in the world) are totally ordered with respect to a certain cardinal direction (to be sure, an oversimplification, but a more complex topological measure could be used); then 4 for all practical purposes equal screws could be the values of the following functions:

1. $f_1 = \lambda j$ the northernmost 8×40 mm screw in x at time t in j

2. $f_2 = \lambda j$ the 2nd northernmost 8×40 mm screw in x at time t in j

3. $f_3 = \lambda j$ the third northernmost 8×40 mm screw in x at time t in j

4. $f_4 = \lambda j$ the fourth northernmost 8×40 mm screw in x at time t in j

If all four are defined for all worlds accessible from i completing the set but one 8 mm by 40 mm screw is missing in i, then 4 is undefined for i; if two 8 by 40 mm screws are missing in i, then 4 and 3 are undefined for i; etc.

Thus by some ranking, there can always be a set of separated concepts, functions that discriminate between individuals that cannot be told apart. However, the ranking must be stipulated, and its choice is quite arbitrary. This, one might contend, raises a problem for the plausibility of the theory.

2.3   Specific readings as special cases

Sentences with rigid terms, like (1), do not have unspecific readings.

(1)   Wolfgang is missing, though.

On the analysis of *be missing* given in (9), (1) gets the representation (17):

(17) $[(\forall j \rhd_x i)\mathbf{I}_j(\boldsymbol{w}_j, x) \,\&\, \neg\mathbf{I}_i(\boldsymbol{w}_i, x)]$

Here $\boldsymbol{w}$ is the intension of the name – the constant function that maps any world k to Wolfgang. I will pursue the idea that specific readings generally are characterized by reference to or quantification over constant concepts.

Take a case with a cardinal determiner:

(18)   After Mary returned my stamp album, I found that three stamps
        were missing.

The feeling we have that the reading is specific stems from the fact that in
the scenario suggested by the sentence, any three witnesses for the quantifier
are real stamps that were in the album until Mary borrowed it; more exactly,
they are functions which constantly yield real stamps that used to be there.
We can conceive of a set of concepts containing, *inter alia*,

f_1: λj the 1953 $2\frac{1}{2}$d Coronation stamp that used to be in the album in i

f_2: λj the 1953 1s3d Coronation stamp that used to be in the album in i

f_3: λj the 1953 1s6d Coronation stamp that used to be in the album in i

These functions are all constant, more specifically, they are either defined
for all worlds or undefined for all worlds, across the board, and whether they
are one or the other depends on whether a stamp of the right type used to
be in the album in the world of evaluation i (denoted by the Ty2 variable
by the same name); then the value is that stamp.[11]
     We have hitherto tacitly assumed that the shifted meaning of a noun
stamp, $\mathbf{S}^+$, or rather its extension, $\mathbf{S}_i^+$, contains functions from worlds k
to stamps (generally things falling under the noun's unshifted extension) *in*
k. This assumption must now be revised. What $\mathbf{S}_i^+$ contains are (partial)
functions from worlds k to things that are stamps *in k or in i*; more exactly,
functions to things that are stamps in k and functions to things that are
stamps in i. In consequence, members like f_1–f_3 are possible, and, a member
is a constant and once and for all defined or undefined function if and only
if it maps worlds k, if to anything at all, to things that are stamps in i.
     It is not unnatural to regard specific readings as arising from a contextual
setting, more particularly, from a certain characterization of the conceptual
cover. To be explicit, we could let determiners, when shifted to denoting
relations between sets of concepts, take a covert cover argument:

(19)   *three″* $= \lambda \boldsymbol{P} \lambda \boldsymbol{C} \lambda \boldsymbol{Q} (\exists^{=3}\boldsymbol{x})[\boldsymbol{P}_i(\boldsymbol{x}) \,\&\, \boldsymbol{C}(\boldsymbol{x}) \,\&\, \boldsymbol{Q}_i(\boldsymbol{x})]$

Here $\boldsymbol{C}$ for 'cover' is a free variable of type $(se)t$; let $\mathbf{C}$ be its value. $\mathbf{C}$ could
now, in a loose analogy from conversational backgrounds (Kratzer 1981), be
characterized as *realistic* iff it exclusively contains functions f which, like
f_1–f_3, are constantly defined or constantly undefined and constant if defined.

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[11]Possibly, whether the functions are defined or not should also be made dependent on
the stamp being in the album in the accessible worlds where the album is complete.

We then have that if $\mathbf{C}$ is realistic, the intersection of the denotation of $\mathbf{S}_i^+$ and $\mathbf{C}$ consists of functions that map a k, if to anything, to a stamp in i.

And if by 'specific readings' we understand interpretations that involve realistic covers, we predict that as far as such readings are concerned there is no difference between (9) and (20), where j, the completion worlds index, is replaced by i, the actual world index, at the occurrence of $\boldsymbol{y}$ (the variable corresponding to the concept(s) referred to or quantified over) in $\mathbf{I}_j(\boldsymbol{y}_{j/i}, x)$. This may be regarded as a welcome result.

(20) $be\ missing' = \lambda \boldsymbol{y} \left[(\forall j \rhd_x i) \mathbf{I}_j(\boldsymbol{y}_i, x) \,\&\, \neg \mathbf{I}_i(\boldsymbol{y}_i, x) \right]$

The specific interpretation is in no way a separate *reading*, though; it is just that special case of setting the cover parameter where it is realistic, so that in effect, those functions from worlds k to stamps in k or i are filtered out that do not target stamps in i (and many more). (20) is thus superfluous.

As a test case, consider a 'mixed' scenario, where one relevant function is undefined for i but two are defined. Suppose I say (21), having in mind one stamp that is too rare for me to even contemplate, another which was there till yesterday, and a third which I own but have not put into the album yet. Would I be uncooperative, misleading you into trying to decide between, on the one hand, something like f_1–f_3 and, on the other, something like f_4–f_6?

(21)   Three stamps are missing (from this page).

  f_4: λj the 1953 $2\frac{1}{2}$d Coronation stamp in the album in j

  f_5: λj the 1953 1s3d Coronation stamp in the album in j

  f_6: λj the 1953 1s6d Coronation stamp in the album in j

Perhaps, but even so, it does not show that there is an ambiguity involved; rather, the situation is typical of the way settings of contextual parameters tend to form natural classes; conversational backgrounds (Kratzer 1981) are again a suggestive analogy. One natural class of conceptual covers relevant for *be missing* is the class where all of the members are constant functions, another is the class where none of them are.

In sum, Zimmermann's prognosis that the difference between the specific and the unspecific readings "comes out as largely a matter of polysemy and coercion" is corroborated.

But wait: we assumed, prematurely perhaps, that the index i in f_1–f_3 is the shiftable world of evaluation, and in consequence, that specificity can be 'non-global' and relative to modal contexts (over and above *missing* itself). Maybe the relevant index is the unshiftable world of utterance instead?

To check that, we must consult an intensional context which constitutes a scope island, with a DP which is not insensitive to such islands: if we can interpret the noun *de re*, we might have reason to select the context world, with a two-dimensional semantics (or a designated context world variable). In fact, we will have reason to trade the term *specificity* for *extensionality*, as there will be a case of the latter without the former – a question under discussion, in a slightly different context, in Zimmermann 2001. Consider:

(22)   Tom suspects that every other stamp is now missing.

The facts of the matter may not be quite clear, but it seems possible to read *stamp* as denoting a set of constant functions yielding stamps that actually exist. However, that could just be an effect of transparent evaluation by free index-binding, the method von Fintel and Heim (2011: 102) refer to as the "standard solution" to the problem of extensionality *cum* unspecificity; the evaluation variable of $\mathbf{S}^+$ could be bound non-locally to begin with.[12]

2.4   The intensional and the extensional part

The content of *be missing* splits, both in Zimmermann's original formulation and in (9), into two conjoined parts. As noted in section 1, the *intensional* part seems to be systematically 'read into' restrictors of quantifiers, causing (23a) to be understood as if it were to have the analysis (23c) instead of the compositionally derived analysis (23b):

(23)   a.   Most stamps are still missing (in my album).

        b. $(\mathbf{M}\,\boldsymbol{y}\colon\mathbf{S}_i^+(\boldsymbol{y}))[(\forall j \rhd_x i)\mathbf{I}_j(\boldsymbol{y}_j,x)\,\&\,\neg\mathbf{I}_i(\boldsymbol{y}_i,x)]$

        c. $(\mathbf{M}\,\boldsymbol{y}\colon\mathbf{S}_i^+(\boldsymbol{y})\,\&\,(\forall j \rhd_x i)\mathbf{I}_j(\boldsymbol{y}_j,x))[\neg\mathbf{I}_i(\boldsymbol{y}_i,x)]$

We also saw that, if the quantifier has an unspecific reading, this is difficult to explain on the basis of Zimmermann's canonical analysis (7) (where the quantifier scopes under the modal operator and quantifies over individuals).

    We may now first note that once (9) replaces (7), the prediction that the intensional part may (or must) restrict the restrictor is no more problematic than for specific readings according to (7). Since now, the quantifier scopes over the modal operator anyway, we can consider it as a case of contextual domain restriction; the set of $\boldsymbol{y}$ (under a conceptual cover) such that $\boldsymbol{y}_j$ is in x in all worlds $j \rhd_x i$ can count as salient discourse objects.

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[12]It also seems possible to read *stamp* as denoting a set of constant functions returning stamps which exist in Tom's suspicion worlds, and in that case, there is all the more reason to maintain that the relevant world index is the shiftable world of evaluation.

In fact, one lesson from section 2.2 is that normally, when producing or interpreting an utterance of $\mathcal{Q}$ $\boldsymbol{P}$ *is missing* (*in x*), we intend or take $\boldsymbol{P}$ to denote a closed set of functions from worlds to Ps in x, defined for all $j \rhd_x i$. I suggested that focusing on such sets is the best way to make sense of talk about unspecific missing individuals in intension. Now from that, it follows that we normally treat the domain of quantification as if the intensional part were to restrict it. But the question naturally arises whether this tendency, strong though it may be, is a rule without exceptions.

The phenomenon as such is well known: in connection with quantifiers – whether adverbial or nominal – or superlatives, parts of the intrasentential material can enter the restrictor:

(24)   John always takes Mary to the movies. (Rooth 1999)

(25)   Almost all tickets were sold at checker 4. (Eckardt 1999)

(26)   The highest mountain was climbed by John. (Heim 1999)

But this can be overridden: there are interpretations where, e.g., the climbed things do not enter into the restrictor. By contrast, recall Zimmermann's observation that "it does not seem possible to override the restrictions needed". Generally, properties that belong, by right of position, in nuclear scopes but make their way into restrictors will be backgrounded and not at issue; this, of course, may well shift from context to context. Is there, then, something that regularly relegates the intensional conjunct to such a secondary status, while the extensional part is regularly foregrounded and at issue?

My answer will be no – at least as far as specific readings are concerned. I will argue that in regard to these, the tendency to read the intensional part into the restrictor is only a tendency which can, in the right circumstances, be overridden. (I return to unspecific readings in due course.)[13]

To see this, consider first some cases without quantifiers, or proportional quantifiers anyway (where the division between restrictor and nuclear scope really matters), where the typical background – foreground, not-at-issue – at-issue partition between intensional part and extensional part is reversed.

(27)   I am sure we all felt that someone was missing today, . . .
            the passing of Joe, but am sure he was with us in spirit.

(28)   (10 Favourite Christmas Music Performances) The one song I think
            is missing from this list: The Kinks' "Father Christmas" from 1978.

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[13]This means that it is not a good idea to hardwire the intensional part as a definedness condition in the definition of *be missing* and say that the presupposition is accommodated into the restrictor.

Here the intensional part is brought to the fore, somewhat at the cost of the extensional part, largely due to the subjective attitude verbs *feel* and *think*. Something's absence is an objective fact we do not express opinions about, so when we do supply verbs like those, it is the intensional part we focus on. Particularly in (28), the author is *presupposing* knowledge of which songs are in x (here: the list) and, by implication, which are not; and throughout, the extensional part is not what is really at issue.[14]

Hence, if the subjects were genuinely quantificational, we would expect this part – rather than the intensional part – to form part of the restrictor. As a matter of fact, though, authentic cases in point prove very difficult to find; let the following constructed example serve the purpose of illustration:

(29)   The exhibition does not include any of the artist's work from before 1900: some 20 paintings and scores of graphic works. In my opinion, most paintings are missing, making the exhibition very incomplete.

On the intended interpretation, the domain (the paintings) is understood to be included in (the artist's work from before 1900 and thus in) the entities that are not in x (the works not on exhibition).

When turning to unspecific readings, it is even more difficult to find cases where the intensional part would not effectively serve to restrict the domain. Still, I believe they may exist. It remains true that when quantifying over individual concepts in connection with *missing from x*, we need to focus on a closed set of functions to things in x, identified in terms of possible worlds where they are defined. But those possible worlds are not necessarily worlds where x is complete; or, it need not be a matter of *all* the worlds where x is complete. Consider a scenario where I am appraising your knitwork:

(30)   I notice you skipped a lot of lice stitches in this sweater. *You* probably don't mind, but in my opinion, most of them are missing.

The lice stitches (single stitches in a contrasting colour) which were skipped never came to be, so the interpretation is unspecific. But all of them are in the sweater in *some* possible worlds, for example, some of those where the sweater is complete (according to me), or, all of those where the sweater is knit in accordance with the pattern (and it is complete according to that);

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[14]Another class of cases where the 'ought to be there' part is easily foregrounded is the 'property reading' of indefinites (cf. section 2.5), e.g.: ""There is something missing," Tony mused out loud. "Shelves maybe." Ziva did not answer but looked in the corner .... A piano was missing but after spending her paycheck and overdoing the credit card, it was going to have to wait until the New Year at least."

those of them that are to my mind *missing* are moreover in the sweater in *all* the worlds where it is, according to me, complete. In other words, the interpretation could be represented as something like (31) (where $\mathbf{S}_i^+$ now represents a set of functions to stitches); more probably, however, the extra restrictor enters into it implicitly, through the conceptual cover, whether this is modelled as a parameter of interpretation or as a free variable.

(31) $(\mathbf{M}\,\boldsymbol{y}\colon \mathbf{S}_i^+(\boldsymbol{y})\,\&\,(\exists j \rhd_x i)\mathbf{I}_j(\boldsymbol{y}_j, x)\,\&\,\neg\mathbf{I}_i(\boldsymbol{y}_i, x))[(\forall k \rhd_x i)\mathbf{I}_k(\boldsymbol{y}_k, x)]$

3   The property reading

There is one reading of *be missing* sentences with indefinite subjects which Zimmermann does not treat – although he considers a formalisation of (31a) (on the unspecific reading of the indefinite), among other formalizations, as (31b), rejecting it as too strong, – but citing Higginbotham (1989: 500) who paraphrases one case like this: "for an F to be missing from a thing y is for y not to have an F, when it is supposed to have an F."

(31)   a.   A screw is missing.

     b. $(\forall j \rhd_x i)(\exists y)[\mathbf{S}_j(y)\,\&\,\mathbf{I}_j(y, x)]\,\&\,\neg(\exists y)[\mathbf{S}_i(y)\,\&\,\mathbf{I}_i(y, x)]$

This formalization does not match the truth conditions of (31a) under any reading, Zimmermann writes. But that is evidently a matter of contextual perspective – for Higginbotham was right: *be missing* and indefinite subjects are sometimes used in just this sense, as evidenced by (32) and (33):

(32)   Freire has won many honours, including the world road title three times, but an Olympic medal is still missing from his collection.

(33)   Seriously, I don't have any tools yet. Even a proper drill is missing in my collection.

This reading can be derived on an analysis along traditional lines like (34):

(34)   *be missing*$' = \lambda\mathcal{Q}\,[(\forall j \rhd_x i)\,\mathcal{Q}_j(\lambda y\,\mathbf{I}_j(y, x))\,\&\,\neg\mathcal{Q}_i(\mathbf{I}_i(y, x))]$

But that would mean abandoning the uniform analysis in terms of concepts. Is there a way to model Higginbotham's 'no F' reading within that format, where the existential takes wide scope, in particular over the negation?

Perhaps, if we think of a conceptual cover containing just one concept, coinciding with the intension of a superlative description, 'the first F in x'. Examples like (35a), of which (35b) seems a fair paraphrase, are suggestive:

(35)   a.   (Gent has already won three Belgian cups and were serious contenders for the title in previous seasons.)
Yet **the first Belgian title** is still missing.

          b.   Yet **a Belgian title** is still missing.

This might do to integrate the 'no F' reading in the concept-based analysis. However, there are reasons to stop short of this move. One is that it seems *ad hoc* to assume a singleton conceptual cover and a function involving a superlative when the determiner is a. In fact, the definite article does occur in what appears to be the same function, but much more rarely:

(36)   However, the Olympic medal is still missing from the trophy cabinet at home.

Secondly, we would expect similar readings from other determiners beside a – the numeral *one*, for one. But (37) cannot have a reading on which the first medal is missing; what it says is that one *subkind* of medal is missing.

(37)   (But despite all her dominance,) one medal is still missing from her collection (– a 100 metre Olympic gold).

The considered reading is evidently limited to indefinites ($+$ definites). This should make us suspicious: it is reminiscent of the Overgeneration problem with the classical analysis of opaque verbs, which Zimmermann (1993) solves by analysing them as operating on properties, which indefinites can express.

    This analysis could work well for the reading of *be missing* at issue here. (32) would be expressing that the property expressed by *an Olympic medal* is "in" his collection in every accessible world completing it but not actually "in" it, where a property P is "in" x in a world k iff there is a P_k in x in k.

    The price to be paid for this solution is that *be missing* is ambiguous; we need to supplement (9) by (38) ($\mathbf{I}_k^\star(P_k, x) \equiv (\exists y)[P_k(y) \,\&\, \mathbf{I}_k(y, x)]$).

(38)   *be missing*$^\star = \lambda P\,[(\forall j \rhd_x i)\mathbf{I}_j^\star(P_j, x) \,\&\, \neg\mathbf{I}_i^\star(P_i, x)]$

    Note that what happens in (37) is probably that we quantify over suitable subproperties, or *hyponyms*. This is easier with medals than with unicorns; but a parallel reading can be obtained with a *hyperonym* of *unicorn* and an opaque verb like *need* or *seek*:

(39)   Scrooge still needs / seeks two animals for his zoo: a unicorn and a spotted elephant with a square trunk.[15]

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[15]This example fuses two scenarios: Donald Duck #252 and Uncle Scrooge #16.

4 The nonzero or zero x

So far, PPs like *from my collection*, *in the comic*, *in my album* have mostly been enclosed in parentheses. The reason is that we have not had an analysis of them – the 'container' argument x has, following Zimmermann (2010), been treated as a free variable, to be contextually determined, and not as a syntactic argument. It is time to remove the parentheses and to treat (intransitive) *be missing* as a binary predicate.

(9^2)   *be missing$'$* $= \; \lambda x \lambda \boldsymbol{y} \, [(\forall j \rhd_x i) \mathbf{I}_j(\boldsymbol{y}_j, x) \, \& \, \neg \mathbf{I}_i(\boldsymbol{y}_i, x)]$

Syntactically this predicate primarily subcategorizes for a *from* phrase, but phrases headed by *in* or, in certain circumstances, yet another preposition will also do.[16] The preposition does not contribute a meaning of its own, as the (underspecified) locative relation $\mathbf{I}$ is supplied by the predicate.

So far, so good, but we have also seen several sentences where such a phrase is missing. Syntactically, the parentheses are justified: the 'container' phrase is always optional. But when it is indeed missing, the argument is always context dependent, it is never existentially closed off.

Zimmermann (2010) hints that the fact that the x argument is anaphoric if it is not saturated syntactically is predictable on the basis of Sæbø (1996). Well, is it? – To briefly recapitulate the central hypothesis of Sæbø (1996): an argument is anaphoric iff it is involved in a presupposition introduced by the predicate. The question is, then, whether x, the container argument, is in fact involved in a presupposition introduced by *be missing*.

On the surface of it, the answer to this question is not yes: there is no sign of a presupposition in the Ty2 translation (9^2). However, we have seen (notably in section 2.4) that the two conjuncts in the content of *be missing* are normally not on a par with each other with regard to the background – foreground, at-issue – not-at-issue distinction. There is normally a partition where one conjunct is, in a loose, pragmatic sense of the word, presupposed while the other is asserted (or, more neutrally, *at issue*). Although usually, the intensional conjunct is backgrounded while the extensional conjunct is foregrounded, sometimes (as suggested by (1), where it is taken for granted that Wolfgang is not present) it is the other way around. Different matrix verbs can serve to select different partitions in embedded clauses:

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[16]This ambivalence could be taken to indicate that the phrases are not arguments but adjuncts; but on the other hand, predicates that subcategorize for two or more different prepositions are not unknown. Anyway, as long as the individual referred to with $P \, x$ is a semantic argument of *missing*, it is difficult to see how else one could analyse the merge.

(40)   It was my job to round them all up at the end of the day and
that was when we **noticed** that Cornelius was missing.

(41)   And even though they all **felt** that Nico was missing,
things were at least a little easier this time.

It is difficult to *notice* that a certain person ought to be present – as difficult as it is to *feel* that a certain person is not present. This is brought out if we present one or the other conjunct in a (nonrestrictive) relative clause:

(42)   ??we noticed that Cornelius, who was absent, should have been present

(43)   ??they all felt that Nico, who should have been present, was absent

Now for the question whether the anaphoricity of an unsaturated x argument is or is not predictable, all that matters is that the one *or* the other conjunct is presupposed; this argument figures in both conjuncts. Thus provided that the non-at-issue status one of them normally has is reflected in anything like a presuppositional Discourse Representation Structure, where all discourse referents present must be introduced and all introduced discourse referents are (following the theory of van der Sandt 1992) anaphoric, – then the fact that x, being such a referent, must be bound syntactically *or contextually* indeed follows. That premiss may be debatable, but Zimmermann's allusion to this sort of explanation was at any rate not entirely off the mark.

5   Perspectives

This is not the final word, by far. For one thing, there are loose ends, issues that should be addressed but have not been. The transitive verb *be missing*, for instance, raises questions that I have left unanswered, as does the verb *miss*. In other languages, we find verbs with a partial overlap with *miss*, *be missing*, and *(be) lack(ing)*; both this third English lexeme and the cross-linguistic facts are worthy of future attention.

    Secondly, what answers have been provided are not definitive. The most solid conclusion we can draw is that yes, the idea of using individual concepts in the analysis of things that are missing looks like a viable one. It is tailored to fit unspecific readings (and it often gives more intuitive results than in Zimmermann's paradigmatic screw case); whether the way to model specific readings suggested in section 2.3 is the appropriate way is more open to debate. There is also reason to be cautious concerning the tendency for the 'intensional part' to restrict the domain; the account offered in section 2.4, building on the discussion in section 2.2, was a bit on the speculative side.

Finally, the separate 'property reading' analysis argued for in section 3 is a costly affair; some way to subsume all interpretations under one analysis should still be sought.

And thirdly, there are sure to be, to quote Zimmermann (2010), "delicate details" to the intentionalist approach – possibly less delicate details too – which I have missed.

On a general note, the remaining loose threads and open seams bear testimony to a fact of natural language that becomes apparent in all that Ede writes: the amazing fact that such small and innocent-sounding words can contain such depths and give rise to such a wealth of riddles.

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