F-marking and Specificity in Sluicing Constructions

Kerstin Schwabe

Abstract

This paper shows that in various Sluicing types, the wh-phrase in the Sluicing sentence as well as its relatum in the antecedent clause must be F-marked, and it explains this observation with Schwarzschild's (1999) and Merchant's (2001) focus theory. Complying with the semantics of the wh-phrase, we will argue that the relatum of the wh-phrase is an indefinite expression that must allow a specific interpretation. Following von Heusinger (1997, 2000), specificity will be defined as an anchoring relation between the discourse referent introduced by the indefinite expression and a discourse-given item. Because specific indefinite expressions are always novel, contexts such as the scope of definite DPs, the scope of thematic matrix predicates, and the scope of downward-monotone quantifiers which all exhibit non-novel indefinites do not allow Sluicing. *

1   Introduction

Sluicing constructions as in (1) lead to many interesting problems related to ellipsis, specificity, and sentence types. Thus, it is a worthwhile topic to show the interface between syntax, semantics and pragmatics as well as to discuss the status of information structure within these three domains.

>   (1)   Peter is reading, but I don't know what __.

The present paper puts forward an integrated analysis of two factors that play an important role in the semantic licensing of Sluicing constructions, namely the focus and the specific-indefinite restriction on the antecedent. The focus analysis is based on Schwarzschild (1999) and Merchant (2001).With respect to the specific-indefinite restriction on the antecedent, the paper proposes a solution within the theory of von Heusinger (1997, 2000). It analyses indefinite expressions as modified epsilon terms and shows that the accessibility conditions of the indefinite in Sluicing depend on the semantics of wh-phrases. The semantics of the wh-phrases presupposes (i) that the entity denoted by the indefinite in the first conjunct must not be anchored in the discourse representation for a discourse participant a and (ii) that it is anchored for another discourse participant b. The first presupposition prevents the entity from being expressed by a definite. The second prohibits that the entity occurs in contexts that do not allow a specific interpretation. Finally, the paper shows in various applications that the focus restriction and the specific-indefinite restriction are two mutually dependent restrictions.

Before we formulate the problems associated with Sluicing constructions such as (1) and try to handle them, let's first see what is meant by the notion of *Sluicing*.

A Sluicing construction consists of two conjoined sentences with the first one being the *antecedent sentence* (AS) and the second one the *Sluicing sentence* (SS). The latter is either a mere wh-phrase as in (2) or, as in (1), consists of a matrix clause (MC) and an embedded wh-clause.

(2) a. A: What is Hans doing?
    b. B: Hans is reading a book.
    c. A: Which one?

The former is only possible if the antecedent sentence and the Sluicing sentence are conjoined asyndetically or if the antecedent sentence is a wh-interrogative. This is due to the fact that with syndetical coordination both conjuncts have to agree with respect to their sentence type and that the antecedent sentence is always a declarative.

What is characteristic for Sluicing is that the wh-clause – we call it *Sluicing clause* (SC) – contains merely a wh-phrase. The antecedent sentence includes the *antecedent clause* which renders the antecedents for the deleted material in the Sluicing clause. It also introduces the discourse referent the wh-phrase is related to. We will call this discourse referent *relatum*. It is the same as Chung's et al. (1995) "inner antecedent" and Merchant's (2001) and Romero's (2000a) "correlate". The proposition that contains the relatum will be labeled *relatum proposition*. Usually, but not always, the antecedent clause denotes the relatum proposition. Cases where the relatum of the wh-phrase is not contained in the sentence that immediately precedes the Sluicing sentence are the following – cf. Merchant (2001):

(3) a. *There was a party yesterday. Do you know who was at this party?*
       BETH was there, but I don't know who else.
    b. *Sheila has some cats and dogs. Do you know how many dogs and cats she has?*
       She has five CATS, but I don't know how many DOGS.

Here the antecedent sentences are non-exhaustive answers to contextually given questions that relate to a sentence introducing the relatum of the wh-phrase in the Sluicing clause. The stress on the subject in (3a) or on the object in (3b) in the sentence that precedes the Sluicing clause indicates that there are alternatives given by the discourse.

Many authors dealing with Sluicing phenomena, for instance Romero (2000a), have discussed the behavior of Sluicing with respect to "weak" (i.e., selective) *islands* that raise the greatest puzzle for Sluicing as in (4). In the Sluicing case (4a), the wh-phrase may escape the island whereas it cannot in the corresponding full version (4b).

(4) a. Sandy was trying to work out which students would be able to solve a certain problem, but she wouldn't tell us which one$_i$ ~~she was trying to work out [which students would be able to solve t$_i$]~~
    b. * Sandy was trying to work out which students would be able to solve a certain problem, but she wouldn't tell us which one$_i$ she was trying to work out [which students would be able to solve t$_i$]

That the wh-phrase seems to be channeled or sluiced through syntactic islands within these constructions was the reason that such constructions were labeled as Sluicing. Merchant (2001) and Schwabe (2000), on the other hand, are largely devoted to a novel solution to the syntactic island problem. They argue that there is no need to assume islands with respect to Sluicing constructions such as (4a). Therefore it would be better to call these constructions *wh-ellipsis*.

As to the characteristics of Sluicing we are interested in, we may *first* mention the commonly known property that the relatum of the wh-phrase is always an indefinite which is

either an overt expression as in (1), (2), and (4) or given implicitly by the verb semantics as in (5).

(5)   Hans left after his mother cooked and he didn't want to tell us what.

Second, we can observe that the indefinite no matter whether explicit as in (6a) or implicit as in (6b) must always be focus-marked or be within a focus-marked constituent.

(6)   a.   Peter has taken a SHIRT, but I won't tell you which one.
        a'.   *It is PETER who has taken a shirt, but I won't tell you which one.
        b.   Peter is READING, but I won't tell you what.
        b'.   *It is Peter who is reading, but I won't tell you what.

Third, the antecedent clause and the Sluicing sentence(s) need not be conjoined symmetrically, but the Sluicing sentence is always adjacent to the antecedent clause – cf. (Ross 1969).

(7)   a.   Hans is reading a book, but I don't know which one.
                [AC & SS]
        b.   They wanted to hire a linguist who speaks a Balkan language, but they
                didn't tell us which.   (Merchant 2001)
                [$_{AS}$ … [AC]] & SS
        c.   Paul saw that John killed a girl and because he knew which one, he
                didn't go to the police.
                AC & [[SS] …]
        d.   Hans left after his mother cooked and he didn't want to tell us what.
                [… [AC & SS] …]
        e.   A girl has got dirty a table-cloth and I want to know which girl and
                which table-cloth.
                AC & [$_{SS}$ … [SC & SC] …]
        f.   This report details what IBM did and why.
                [$_{SS}$ … [AC & SC] …]   (Merchant 2001)

Fourth, the indefinite must not occur in contexts that do not allow a specific interpretation of the indefinite. Contexts of this kind are for instance the description of definite DPs (8), complements of thematic matrix predicates (9), the scope of downward-monotone quantifiers (10) (cf. Albert 1993 and Romero 2000a), and the dependency on non-specific indefinite DPs (11).

(8)   a.   *They found the man yesterday who has kissed a woman, but they
                won't tell us which one.
        b.   *Yesterday, I bought the book about a politician, but I've forgotten
                about which one.
        c.   *Yesterday, I saw the boy who was reading, but I cannot say what.

(9)   a.   *Ramon is glad that Sally was dancing with a boy, but I don't remem-
                ber with which one.
        b.   *They regretted that they were reading, but I don't know what.

(10) a. *They hired few people who spoke a lot of languages – guess how many!   (Merchant 2001)
      b. *Joan rarely read any book, but I don't know which one.
      c. *They hired no people who spoke a lot of languages – guess how many!
      d. *John never makes any joke when he has guests, but I don't know which one.
      e. *John rarely sings any song when he has guests, but I don't know which one.
      f. *Paul didn't want to read any book, but I don't know which one.
      g. *Few kids ate, but I don't know what.   (Romero 2000a: 200)
      h. *Joan rarely fed my fish, but I don't know with which product.
      i. *They met no people who were reading, but they did not tell us what.
      j. *John never cooks himself when he has guests, but I don't know what.
      k. *John rarely cooks himself when he has guests, but I don't know what.
      l. *Paul didn't want to read, but I don't know which book.

(11) ?They are looking for some linguist who has written a thesis, but they cannot tell you which one.

And finally *fifth*, the relatum must be contained in a proposition that is denoted by the antecedent clause or can be inferred from it. This proposition is supposed to be true by the attitudinal subject of the Sluicing sentence. Thus, the interpretation of (12) succeeds if the anticipated proposition 'the addressee buys a book' is true in some situation. This can be expressed by *then* as in (12a) or by the conditional as in (12b). It fails when both conjuncts are interpreted as being only a sequence of imperatives as in (12c).

(12) a. Go and buy a book and (then) tell me which one!
      b. Go and buy a book and (if you buy one,) tell me which one!
      c. *Go and buy a book and tell me which one!

We will see in section two that the focus condition on the indefinite, that the affirmative proposition condition, and the adjacency condition can be derived from Schwarzschild's (1999) and Merchant's (2001) focus theory. In section three, we will explain the observation that Sluicing is not well-formed if the relatum is in a thematic context or depends on a non-specific DP. There we take the semantics of wh-phrases as a starting point, which demands that the relatum of the wh-phrase must be an indefinite and that this indefinite must allow a specific interpretation. On the basis of von Heusinger's (1997, 2000) theory on specificity we will explain why the various contexts given in (8) to (11) prohibit Sluicing.

2 Information structure of the antecedent clause and the Sluicing clause

According to Schwarzschild (1999), F-markers are freely assigned and subject to constraints such as *FOC*, *HEADARG*, *GIVEN*ness, and *AVOIDF*. *FOC* demands that a F-marked phrase contains an accent if it is not immediately dominated by another F-marked node whereas *HEADARG* regulates that a head is less prominent than its internal argument. *AVOIDF* prevents F-marking more phrases than necessary whereby *GIVEN*ness must not be violated. The latter constraint says that a constituent that is not F-marked must be *given*. As to Schwarzschild's definition of *given* see (13):[1]

(13)   (i)   *Definition of Given* (informal version)
An utterance U counts as GIVEN iff it has a salient antecedent A, and if U is of type e, then A and U corefer;
otherwise: modulo $\exists$-type shifting, A entails the Existential Closure of U.

(ii)   *Existential Closure of U* (F-clo (U))
The result of replacing F-marked phrases in U with variables and existentially closing the result, modulo existential type shifting

It follows from Schwarzschild's theory that only *given* constituents must be licensed and that F-marked constituents may be either *novel* or *given*. Turning to the possibility of ellipsis as in the Sluicing clause, Merchant (2001) has shown that Schwarzschild's focus theory must be extended to ensure the semantic identity of the phonologically empty material with the antecedent material it corresponds to. Thus, the IP in the Sluicing clause can only be deleted if the Sluicing clause satisfies e-GIVENness.

(14)   e-GIVENness   (Merchant 2001)
An expression E counts as e-GIVEN iff E has a salient antecedent A and modulo $\exists$-type shifting,

   (i)   A entails F-clo(E), and   (cf. Schwarzschild 1999)
   (ii)   E entails F-clo(A).

Note that 'F-clo' corresponds to Schwarzschild's Existential Closure in (13). As we may see with respect to (15), the matching of the information structural properties of the Sluicing and the antecedent clause with e-GIVENness entails that the whP as well as its relatum must be F-marked and that the antecedent clause must be propositional.

(15)   They hired a linguist who knows a [BALKAN language]$_F$ but I do not know [which one$_F$ ~~he knows~~]

Here the antecedent clause is the relative clause of the first conjunct where only the object *a Balkan language* is F-marked. Because the IP in the Sluicing clause is *given*, it must fulfil e-GIVENness. According to the definition of e-GIVENess in (14i), the antecedent clause entails the existential F-closure of the Sluicing clause (16i). And vice versa, according to (14ii), the proposition derived from the interrogative Sluicing clause by existential type shifting entails the existential F-closure of the antecedent clause (16ii). We get the existential F-closure of the Sluicing clause by binding the variable that is given by the focused wh-phrase existentially.[2]

(16)   (i)   He knows a Balkan language $\rightarrow$ $\exists x\ [\ \text{know (he) (x)}]$
                (= $\Box$AC$\Box$)
  (ii) $\exists x\ [\ \text{know (he) (x)}]$ $\rightarrow$ $\exists x\ [\ \text{know (he) (x)}]$
                (= $\Box$\$C$\Box$)

In that the antecedent clause must be a proposition, it is a non-restrictive relative clause. This means it cannot be interpreted as a restrictive relative clause, since the latter is of type

<<e,t><e,t>>. Additionally, it is a judgement because the adversative Sluicing sentence can only be related to a proposition that is true.

The next example shows what happens if the whole IP of the antecedent sentence is F-marked.

(17) They invited a boy who [knows$_F$ a Norwegian$_F$]$_F$ but I do not know [which one$_F$ ~~he knows~~]

  (i)   He knows a Norwegian $\rightarrow$ $\exists$x [know (he) (x)]
  (ii) $\exists$x [know (he) (x)] $\rightarrow$ $\square$x $\exists$Q [Q (he)(x)]

IP-ellipsis in the Sluicing clause is possible because e-*GIVEN*ness is satisfied. That the relatum of the wh-phrase must be F-marked follows, as we can see in (16ii) and (17ii), from (ii) in e-*GIVEN*ness (14).

E-*GIVEN*ness also explains why the VP must be F-marked if the relatum is expressed implicitly. According to (14ii), it must be F-marked so that the existential F-closure of the antecedent clause can be entailed by the Sluicing clause.

(18) She is writing$_F$, but I can't imagine what$_F$.

  (i)   She is writing $\rightarrow$ $\exists$x [write (she) (x)]
  (ii) $\exists$x [write (she) (x)] $\rightarrow$ $\exists$Q [Q (she)]

That the relatum of the wh-phrase can also be an unspecified argument of a relational noun can be seen in the next example:

(19) Maria has [bought$_F$ tickets$_F$]$_F$, but she doesn't tell us for which film$_F$.

Up to now, the antecedent for the Sluicing clause was always a proposition that was expressed by the antecedent clause. But there are cases where the Sluicing clause relates to a proposition that must be derived from the antecedent clause of the Sluicing clause:

(20) a. Sandy was trying to identify which student solved a certain problem, but she wouldn't tell us which one.   (Merchant 2001)
      b. Peter told me who Mary met and why.
      c. Did Peter buy a book and do you also know which one?
      d. Go to the party, but do not tell me with whom!

The propositions that are to be derived are something like: 'The student that Sandy has identified solved a problem' for (20a), 'Mary met somebody' for (20b), 'Peter bought a book' for (20c), and 'Hearer goes to the party' for (20d). Following Schwarzschild (1999: 157), let us try to use existential type shifting to obtain a proposition out of the interrogative antecedent clause in (20a) by binding the free variable by an existential operator and checking whether e-*GIVEN*ness (14) is met.

(21) (i) $\exists$x $\exists$y [student (x) $\land$ problem (y) $\land$ solve (x) (y)] $\rightarrow$
              $\exists$y $\exists$x [student (x) $\land$ problem (y) $\land$ solve (x) (y)]
      (ii) $\exists$y $\exists$x [student (x) $\land$ problem (y) $\land$ solve (x) (y)] $\rightarrow$
              $\exists$y $\exists$x [student (x) $\land$ problem (y) $\land$ solve (x) (y)]

We observe that e-*GIVEN*ness is met in (21), where the subject in the antecedent clause, which is represented similarly to an indefinite, is copied into the Sluicing clause. However, (21) does not account for the fact that the subject of the Sluicing clause must be an anaphoric expression as indicated in (22):

(22)   Sandy was trying to identify which student solved a certain problem,
   a.   *but she wouldn't tell us which (a student solved).
   b.   but she wouldn't tell us which one (the student she has identified solved).

This example as well as (20b) show that we cannot gain the necessary antecedent proposition by existential type shifting of the interrogative antecedent clause, but by accommodating an answer to the question that contains an anaphoric expression such as 'the student that Sandy has identified solved a certain problem' or 'Mary met the person she met' respectively. These propositions can now be used to check whether e-*GIVEN*ness is met.

(23)   (i)   def. student solved a certain problem $\rightarrow$
             $\exists y$ [problem (y) $\wedge$ solve (def. student) (y)]
       (ii) $\exists y$ [problem (y) $\wedge$ solve (def. student) (y)] $\rightarrow$
             $\exists y$ [problem (y) $\wedge$ solve (def. student) (y)]

Turning to (20c), we notice that there it is also not possible to obtain the antecedent proposition for the Sluicing clause by existential type shifting of the yes-no interrogative.

(24)   (i) $\exists f \exists x[f$ (book (x) $\wedge$ read (peter) (x))] $\rightarrow \exists x$ [book(x) $\wedge$ read (peter)(x)]
       (ii) $\exists x$ [book(x) $\wedge$ read (peter)(x)] $\rightarrow \exists f \exists x[f$ (book (x) $\wedge$ read (peter) (x))]

The entailment relation would be invalid if the variable 'f' were instantiated by a function that mapped the proposition onto a negative proposition – cf. note 2:

(25)   (i) $\neg \exists x[$book (x) $\wedge$ read (peter) (x)] $\Box \exists x$ [book(x) $\wedge$ read (peter)(x)]
       (ii) $\exists x$ [book(x) $\wedge$ read (peter)(x)] $\Box\neg \exists x[$book (x) $\wedge$ read (peter) (x)]

Since the antecedent proposition cannot be obtained by existential type shifting, it must be derived in some other way. It can be derived by accommodating the affirmative answer to the question given by the antecedent clause. As to the imperative in (20d), the antecedent is the accommodated proposition that represents the action the addressee is asked to do. Having the necessary antecedent proposition and relating it to the type-shifted Sluicing clause, it is easy to work out that e-*GIVEN*ness is met.

So far we have shown and explained that and why the relatum in the antecedent as well as the wh-phrase in the Sluicing clause must be F-marked. That Merchant's and Schwarzschild's theory also holds for all Sluicing types given in (7) is easy to work out. Additionally, we have demonstrated that if the antecedent clause is non-propositional, the antecedent proposition must be derived by accommodation.

3 Appropriate and inappropriate contexts for Sluicing

3.1 The need for specificity

Recall that contexts that do not allow for Sluicing are the description of definite DPs (see (8) or (26a)), the description of complements of thematic matrix predicates (see (9) or (26b)), the scope of downward-monotone quantifiers (see (10) or (26c)), and the dependency on non-specific indefinite DPs (see (11) or (26d)).

> (26) a. *They found the man who has kissed a woman, but they won't tell us which one.
>
> b. *Ramon regrets that Sally was dancing with a boy, but I don't remember with which one.
>
> c. *They hired few people who spoke a lot of languages – guess how many!
>
> d. ?They are looking for some linguist who has written a thesis, but they cannot tell you which one.

With Heim (1982) and Schwarzschild (1999), we regard the referent of a definite DP as an entity which is thematic or given, respectively. But to be given need not mean that it must have been mentioned in the current discourse or that it is prominent in the utterance situation. An entity can also be seen as given if it is anchored in the mental lexicon of the discourse participants. It can be retrieved from there and introduced as a novel discourse referent into the current discourse.[3] Let us assume that as the description of definite DPs, also the description of thematic complements and the scope of downward-monotonic quantifiers are thematic, that means given. According to *AVOIDF* and *GIVEN*ness, the constituents in these contexts actually need not be F-marked.

That according to *GIVEN*ness, non-F-marked constituents must be *given* does not mean that all F-marked constituents must be non-*given*. Or to formulate the question in another way: Are there given elements that can be asked for? Schwarzschild (1999: 158ff.) shows that there are cases like (27) where a *given* constituent must be F-marked to satisfy *GIVEN*ness.

> (27) *Who did John's mother praise?*
> A: She praised [HIM]_F

Here the object in the answer must be F-marked because the existential F-closure of the answer must be entailed by the type-shifted question. If it were not F-marked, existential F-closure could not take place. Now we could ask whether the given definite DP can be F-marked. The answer is yes, as long as it can be asked for and thus a *GIVEN*ness effect can obtain.

To demonstrate this, we take (28a) as a contextually given question. With this question, the whole DP in the answer (28b) must be F-marked.

> (28) a. They have found somebody, but I don't know who?
> b. They found [the man who kissed a WOMAN]_F.

According to Schwarzschild's (1999: 170) *Foc*-constraint, *Foc*-marked material must be accented. Therefore *woman* carries the pitch accent. The question arising now is why the

indefinite in thematic contexts cannot be related to by the wh-phrases in the following Sluicing constructions:

(29)   *They found [the man who has kissed a woman]$_F$, but they won't tell us which one.

(30)   *Ramon regrets [that Sally was dancing with a boy]$_F$, but I don't remember with which one.

We suggest that an indefinite in a thematic context cannot be related to by a wh-phrase if the entity it denotes is interpreted as non-specific by the attitudinal subject of the wh-interrogative. We consider the latter to be the subject that poses the question. It can either be expressed explicitly within the matrix proposition of the Sluicing sentence, or it can be the speaker if the Sluicing sentence consists only of a wh-phrase like in (2c).
That the relatum of the wh-phrase must be an indefinite and that this indefinite must allow for a specific interpretation for the attitudinal subject is presupposed by the wh-phrase. Let's suppose that a wh-question is something like an instruction to choose a value for a variable out of a value set.[4] This value set is denoted by the restriction of the wh-phrase. Thus the wh-phrase presupposes *first* a value set that is not a singleton. *Second* the wh-phrase presupposes that the choice of a particular value out of this set is possible. Both conditions are necessary to get a coherent answer for the question. As to the antecedent clause for a question, the value set is denoted by the description of the relatum DP in that clause. This DP can only be an indefinite DP because the value set for an indefinite DP need not be a singleton and because indefinites allow the choice of a particular value for the variable they introduce. If there is a choice of a particular value for a value set, we speak, following Farkas (2002), of a specific interpretation of the indefinite or, to be short, of a specific indefinite. A definite DP, on the other hand, has a value set that is a singleton. This prevents it from serving as the relatum for a wh-phrase.

Let us return to contexts as in (26a) that do not allow a specific interpretation of the indefinite *a woman* for the attitudinal subject *they*. Notice that the antecedent of the attitudinal subject is not contained in the thematic antecedent clause, but in the non-thematic matrix clause. Now the question arises why the attitudinal subject of a non-thematic sentence cannot have access to a discourse referent introduced by an antecedent clause as in (26a-c) which contains given or thematic material.

If an indefinite is given, a discourse referent with the same description has been introduced before and has not been assigned a value, and has thus become existentially bound. This happens if the discourse referent is not relevant to the subsequent discourse. If it is not relevant, it, metaphorically speaking, logs out or goes offline, respectively. Then it can go lost and can hardly be retrieved anymore.[5] A discourse referent goes online when it is introduced or logged in by an indefinite expression in a particular sentence (see Heim's (1982) Novelty condition). If the discourse referent is needed for the ongoing discourse as in the sequence of an antecedent clause and a Sluicing clause, this means transsententially, it must stay online and thus be anchored to the discourse. It is then anchored to a further discourse referent and thus accessible to the attitudinal subject of the Sluicing sentence. As we can see with respect to the complements of the thematic predicates in (26a-c), they only consist of one clause which means that within this thematic context, the discourse is not continued. It follows that the discourse referent introduced by the indefinite is not anchored to the discourse and thus not accessible to the attitudinal subject.

But what happens if the discourse proceeds in thematic contexts? The next examples show that Sluicing is possible also in thematic contexts. Sluicing there only obtains there if the attitudinal subject is in the same thematic context.

(31) a. They found [the man who has kissed [a woman]$_{F,\ the\ man}$ and who didn't tell us which one]$_F$.
      b. *They [found the man who has kissed a woman$_{they}$]$_F$ and I won't tell you which one.

(32) a. Ramon regrets [that Sally was dancing with [a boy$_{sally}$]$_F$ and that she didn't remember with which one]$_F$.
      b. *Ramon regrets [that Sally was dancing with a boy$_{ramon}$]$_F$ and he doesn't remember with which one.

In (31a) and (32a), the discourse referent introduced by the indefinite can only be anchored to the subject of the embedded antecedent clause and not to the subject of the matrix clause or to the speaker. If it is anchored to the subject of the embedded relative or complement clause, it can be specific for the attitudinal subject of the Sluicing sentence.

From this we conclude that the discourse referent introduced by the indefinite in thematic clauses can only be anchored to a discourse referent that is introduced by this thematic proposition. If, on the other hand, the respective proposition is non-thematic, it can be anchored to a discourse referent either introduced by this proposition as in (33a) or by an embedding proposition as in (33b). Or it can even be anchored to the speaker as shown in (33c).

(33) a. Peter told us that Karl kissed a woman$_{karl}$, but he$_{peter}$ cannot tell you which one.
      b. Peter met a boy who kissed a woman$_{peter}$, but he$_{peter}$ cannot tell you which one.
      c. Peter wants to read a Norwegian novel$_{speaker}$, but I don't tell you which one.

That the relatum of the wh-phrase must allow a specific interpretation for the attitudinal subject also holds for the relatum of the *whatP* as in (34), which is often thought to be non-specific.

(34) A: Peter is reading a book, but I do not know what kind of book (the book he is reading is).
      B: The book he is reading is a BORING one.

The *whatP* asks for a property of a specific DP. This means it asks for a further predication of an online discourse referent. This is attested in (34) by the full-fledged version of the Sluicing clause and by the definite expression in the answer.

Let's conclude: On the one hand, the relatum of a wh-phrase must be specific for the attitudinal subject of the Sluicing sentence. It can only be specific if it is online for the attitudinal subject. On the other hand, an indefinite DP in a thematic context cannot be interpreted as being specific if the attitudinal subject of the Sluicing sentence is outside this thematic context. Then the information-structural status of the indefinite tells the attitudinal subject of the Sluicing sentence that there is a *given* but offline discourse referent. That this discourse referent has gone offline is due to its irrelevance to the discourse. This irrelevance

is passed on to the subsequent discourse so that the discourse referent introduced by the indefinite in thematic contexts has no choice but to log out. This contradiction explains why the discourse referent that is introduced by an indefinite in a thematic context is not accessible to an attitudinal subject and thus to the wh-phrase outside the thematic context.

In the following section, we will see how the notion of specificity, up to now given pretheoretically, is modeled in von Heusinger's (1997, 2000) theory.

3.2 The representation of specificity in Sluicing

As von Heusinger (1997, 2000) explains, indefinite DPs can vary in their referential properties along (at least) two dimensions: scope and specificity. To represent these independent properties appropriately, we take von Heusinger's (1997, 2000) theory, in which indefinite DPs are represented as indexed epsilon terms. This is illustrated in (35):

(35) a painting: $\varepsilon_i x$ [painting(x)]

The epsilon operator is interpreted as a choice function that assigns to each (non-empty) set one of its elements. In other words, the referent of an indefinite DP is found by the operation of selecting one element out of the set that is described by the description. The selection depends on the context in which the indefinite is located. This treatment is similar to that discourse representation theories (Heim 1982; Kamp 1981), where indefinites introduce new individual variables or discourse referents. One of the main advantages of using choice function variables instead is the following: Indefinites need not be moved or raised to express different dependencies. They remain *in situ*, whereas the choice function variable can be bound by different operations, e.g adverbs of quantification, existential closure, etc. This causes different scope readings of the indefinites.

Specificity is taken as an independent referential property of indefinite DPs (see Fodor & Sag 1982, Enç 1991, Farkas 1995 and 2002). Following von Heusinger (2002), we assume that a specific indefinite DP is "referentially anchored" to a discourse item. This can be the speaker or some other index of the utterance context, on the one hand, or some introduced referent, on the other. Since the discourse referent is anchored to some discourse participant, it can stay online and be subject to further linguistic operations.

The anchor relation is represented by a function *f* from that discourse item to a certain choice function. In other words, the function *f* links the choice of the indefinite to the value of this discourse item. The indefinite receives therefore the same scope as the discourse item it depends on. If the indefinite DP is not anchored and thus goes offline, its context index variable is existentially bound.

Example (36) illustrates the different referential options of the indefinite. The example can be assigned a non-specific reading of the indefinite ("There is some painting by Picasso or other such that John likes it"), as in (36a). The more prominent specific reading (36b) can be paraphrased as "I can identify a picture and this picture is such that John admires it". There is another specific reading of (36), namely (36c) with the paraphrase "John has a particular picture of Picasso in mind, and he admires it, but I cannot tell which one".[6]

(36)   John admires a painting of Picasso.
    a. $\exists i$ [admire(john, $\varepsilon_i x$ [painting(x)])]
          (non-specific)
    b.   admire(john, $\varepsilon_{f(\text{speaker})} x$ [painting(x)])]
          (specific: *speaker*-anchored)

c.   admire(john, $\varepsilon_{f}(john)x$ [painting(x)])
         (specific: *subject*-anchored)

(36b) and (36c) differ in that the indefinite is anchored to different discourse items.
The different referential properties of indefinite DPs are additionally dependent on the information structure (see Lenerz 2001) and on other constructions, such as coordination (see Schwabe & von Heusinger 2001).

Having the two necessary ingredients: the need for specificity and the appropriate representational format, we can now represent the different contextual behavior of antecedent clauses.

If the relatum of the wh-phrase in the Sluicing sentence must allow a specific interpretation, the context index of the epsilon operator in the semantic representation of the relatum must be substituted by a function *f* from some discourse item to a certain choice function. This means that the function *f* assigns to the discourse item a particular choice function, and thus a particular element that is assigned to the given set. In the following example the function *f* relates the particular choice function to the speaker:

(37)   Peter is dancing with a girl, but I won't tell you with which one.
       peter is dancing with $\varepsilon_{f(speaker)}z$ [girl (z)], but … wh (z): girl(z): peter is-dancing-with z

If the relatum is in the scope of a universal quantifier as in (38), the function *f* relates the particular choice function to a particular boy – each boy has his own choice of a particular girl.

(38)   Every boy was dancing with a girl, but I don't know with which one!

       Every(x): boy(x): x was dancing with $\varepsilon_{f(x)}z$ [girl(z)],
       but … wh (z): girl (z): Dist (x): boy (x): x was dancing-with z

The answer to such a Sluicing sentence would be a pair-list answer such as *Peter was dancing with Petra*, *Paul was dancing with Maria*,…. This example shows that to get the specific-narrow scope reading in the Sluicing clause, there must be an intervening operator between the wh-phrase and its trace. The distributing operator in (38) is necessary to prevent the cumulative reading. It distributes over the set of boys such that each boy dances with a particular girl. Contrary to Romero (2000a: 197ff.), the example (39) shows that also a Sluicing clause with a non-overt relatum may contain an operator:

(39)   Every boy was dancing last night, but I won't tell you with whom (they were dancing each/every boy was dancing).

She bases her claim on the scope parallelism requirement between the antecedent and the Sluicing clause (Chung et al. 1995) and on the observation that implicit indefinites have always narrowest scope (Fodor & Fodor 1980). In her framework, the wh-phrase in the Sluicing clause has wide scope, and because the implicit indefinite in the antecedent clause must have narrow scope, the parallelism requirement is not met. If there are any "apparent intervenors" as in (38) between the wh-phrase and its trace, she translates the QP into an E-type pronoun that doesn't count as an intervenor anymore. But her proposal does not hold because a distributing operator is needed to interpret the predicate in the Sluicing clause – see

(38). Additionally, it is not true that implicit indefinites must always have narrowest scope. There are cases like in the following example where also implicit indefinites may have wide scope:

(40) A: Every child in the kindergarten is dancing, but I do not know with whom.
      B: With Agnes, I believe.

We can also construe a context where the indefinite DP in (38) has wide scope like the implicit indefinite in (40). Then the choice of the indefinite DP depends on the speaker or some other discourse participant:

(41) Every(x): boy(x): x was dancing with $\varepsilon_{f(speaker)}z$ [girl(z)],
      but … wh(z) : girl(z): Dist (x): boys (x): x was dancing-with z

The relatum however cannot have a non-specific interpretation like the narrow scope one in (42) or the wide scope one in (43) because it would then not be accessible to the wh-phrase in the Sluicing sentence.

(42) *Every(x): boy(x): $\exists_i$ [x was dancing with $\varepsilon_i z$ [girl(z)]], but …
(43) *$\exists_i$ [Every(x): boy(x): x was dancing with $\varepsilon_i z$ [girl(z)]], but …

As we have already mentioned, the specific reading of the relatum cannot obtain if the relatum is in the scope of a definite article or a thematic predicate and the attitudinal subject of the Sluicing sentence is not. Because the description of definite DPs as in (44) and the complement of thematic matrix predicates as in (26a-c) are thematic or *given*, respectively, the indefinite expression in them is also *given*. To be *given* means for an indefinite DP that a discourse referent with the same description has previously been introduced, but has gone offline. That it has gone offline indicates that there wasn't any interest in anchoring it. Because there is no need for its anchoring, the discourse referent that according to Heim's (1982) Novelty condition is introduced by the indefinite expression in the antecedent clause is also not anchored – cf. (44) and (45). Thus Sluicing always fails in such contexts.

(44) *$\exists_i$ [They found the man yesterday who has kissed $\varepsilon_i x$ [woman (x)]] but they won't tell us which one.

(45) *$\exists_i$ [Ramon is glad that Sally was dancing with $\varepsilon_i x$ [boy (x)]] but I don't remember with which one.

That indefinite DPs in thematic antecedent clauses cannot be specific for attitudinal subjects outside this thematic context explains why their context index cannot be substituted with a function *f* that relates a particular discourse item to a particular choice function. Their context index can only be bound existentially, which blocks them from being related to by the wh-phrase of the subsequent Sluicing clause.

    That thematic relata are unsuitable antecedents for the wh-phrase outside the thematic contexts can also be attested with respect to downward-monotone quantifiers. Their scope is *given* by the context as well. Thus, they can only contain non-novel indefinite expressions and not render relata for the wh-phrase.

    But as Merchant (1999: 252) and Romero (2000a) point out, constructions such as in (46) are evaluated as well-formed by some informants.

(46) a. ?They hired few people who spoke a lot of languages – guess how many!

b. ?Few kids were reading, but I don't know what (they were reading each).

This becomes possible when these informants interpret the expression *few linguists* as a plural set and not as a downward-monotone quantifier phrase. The plural set can be related to by an E-type pronoun in the Sluicing clause (cf. Evans 1980). But to obtain the correct interpretation of the predicate in the Sluicing clause, this set must be distributed. Because the set interpretation does not presuppose *given* material, the indefinite expression *a lot of languages* can be non-*given* and thus specific so that the choice function can be related to a particular discourse item.

The following example shows that an indefinite DP is not accessible to a wh-phrase if this indefinite depends on a non-specific indefinite DP.

(47) They are looking for a linguist who speaks a Balkan language, but they cannot tell you which.
*$\exists$i [They are looking for ε_ix [linguist(x)] &
ε_ix [linguist(x)] speak $\varepsilon_{f(x)}$ z [Balkan language (z)]], but …

If the first indefinite DP *a linguist* is non-specific and the reference of the second indefinite DP *a Balkan language* depends on the first indefinite, the DP *a Balkan language* inherits the non-specificity of this DP. Then Sluicing is not possible.

The indefinite DP *a Balkan language*, however, can be specific if it is related to some discourse referent as for instance the speaker (48) or to the linguistically introduced discourse item *a linguist* which is related by the function *f* to the subject of the antecedent sentence (49).

(48) $\exists_i$ [They are looking for ε_ix [linguist(x) & speak (x)($\varepsilon_{f(speaker)}$ z [Balkan language (z)])]], but ....

(49) They are looking for $\varepsilon_{f(they)}$ x [linguist(x) &
speak (x)($\varepsilon_{f(x)}$ z [Balkan language (z)])], but ...

To sum up this section, we should record that the antecedent or relatum, respectively, of the wh-phrase must allow a specific interpretation for the attitudinal subject. For this reason, the scope of thematic predicates, the description of definite DPs, the scopi of downward-monotone quantifiers, and the dependency on non-specific indefinite DPs cannot render the needed relata if the attitudinal subject is not in the scope of thematic predicates, articles and downward-monotone quantifiers as well as of non-specific indefinites. If, on the other hand, the attitudinal subject is in the scope of the above mentioned items, Sluicing is obtainable.

(50) a. Ramon regrets that Fred kissed a girl and didn't tell him which one.

b. Tom criticized the friend who kissed a girl and didn't tell him which one.

c. No one has read a book and didn't say which one.

d. They are looking for a linguist who knows a Balkan language and doesn't tell them which one.

4   Conclusion

The observation that in various Sluicing types, the wh-phrase in the Sluicing sentence as well as its relatum in the antecedent clause must be F-marked was explained following Schwarzschild's (1999) and Merchant's (2001) focus theory. Furthermore, according to the semantics of the wh-phrase, it was argued that the relatum of the wh-phrase must be an indefinite that must allow a specific interpretation. According to von Heusinger (1997, 2000) specificity was defined as an anchoring relation between the discourse referent introduced by the indefinite expression and a discourse-given item.

It has turned out that specific indefinite expressions are always novel or non-*given* and thus F-marked. The reason is that they introduce a new discourse referent that is contextually anchored after its introduction. If there were already a contextually anchored discourse referent, it could not be an indefinite that could be used to pick up this discourse referent, but only a definite expression. Non-specific indefinites, on the other hand, can be *given* as well as non-*given*. In both cases, their context index is existentially bound, which means that the discourse referent they denote is not relevant to the discourse. A *given* indefinite merely indicates that a discourse referent with the same description has been introduced previously, has been considered to be irrelevant, and therefore has been logged out.

Since specific indefinite expressions are always non-*given*, contexts such as the scope of definite articles, the scope of thematic matrix predicates, and the scope of downward-monotonic quantifiers that exhibit *given* indefinites do not allow Sluicing.

To stay online, specific discourse referents that are introduced by indefinites must be picked up by an anaphoric expression in the next sentence. This explains why the antecedent clause must be adjacent to the Sluicing sentence.

Indefinites that are in thematic contexts can be related to by a wh-phrase if the attitudinal subject of the Sluicing sentence is identical with the discourse referent the indefinite is anchored to. This discourse referent can only be expressed by the proposition the indefinite is contained in. Since the proposition is a thematic context, there are no discourse referents available to which the indefinite could be anchored to be specific for the discourse outside the thematic context.

In that, unlike Chung et al. (1995) and Romero (2000a), we see specificity as decisive for well formed Sluicing constructions, we get the possibility of an unified account of Sluicing with explicit and implicit relata and a more comprehensive and appropriate account of the failing of Sluicing in the above mentioned contexts. Furthermore, we have shown that Sluicing is nothing more than a text relation between an antecedent clause and a wh-question where ellipsis is possible because of Merchant's e-*GIVEN*ness.

1 Schwarzschild (1999) defines existential type shifting as raising expressions to type t, by $\exists$-binding unfilled arguments.

2 Following von Stechow & Zimmermann (1984) and Krifka (2001a), we consider a question to be a function which results in a proposition if it is mapped onto the meaning of its answer:

(i)   A: Who does Hans love? $\lambda x \in$ PERSON [LOVE hans, x]

        B: Anna.   anna

        question mapped onto the answer:

        $\lambda x \in$ PERSON [LOVE hans, x] (anna)

        = LOVE hans, anna

(ii)   A: Does Petr read a book? $\lambda f [f$ (READ (p) (b))]

        B: Yes. $\lambda p [p]$

        question mapped onto the answer:

        $\lambda f [f$ (READ (p) (b))] $(\lambda p [p])$

        = READ (p) (b)

(iii)   A: Does Petr read a book? $\lambda f [f$ (READ (p) (b))]

        B: No. $\lambda p [\neg p]$

        question mapped onto the answer:

        $\lambda f [f$ (READ (p) (b))] $(\lambda p [\neg p])$

        = $\neg$READ (p) (b)

3 That there are definite DPs that denote discourse referents that are novel with respect to the discourse is also discussed in Umbach (2002). She remarks that such definite DPs contain an accent whereas definite DPs that are given in the discourse do not. An accent in a definite DP indicates that it is either F-marked itself or is dominated by a F-marked constituent.

4 As to the notion of 'value set' see Farkas (2001).

5 Krifka (2001b) terms given indefinite NPs as "non-novel indefinites". He discusses them in the context of adverbial quantification and information structure, in examples like (i) and (ii). An indefinite NP in the background is marked as non-novel (=NN). The difference in information structure determines the domain of quantification as illustrated in the paraphrases:

(i)   [A freshman]$_{NN}$ usually wears a BASEBALL cap. "Most freshmen wear a baseball cap"

(ii)   A FRESHMAN usually wears a [baseball]$_{NN}$ cap. "Most baseball caps are worn by freshmen"

6 The formulations "has in mind" or "can identify" should motivate the specific reading. However, such formulations are very informal, and in certain contexts even misleading (see von Heusinger 2002 for a detailed discussion).