

## CONJUNCTIVE AND DISJUNCTIVE *WH*-CLAUSES

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### I. Introduction

This paper will seek to demonstrate the existence and distribution of two different types of *wh*-clauses. Often, both types are referred to as “questions” (whether embedded or in main clauses), even though, as we will see, not all of these clauses have the standard function of seeking information. I will distinguish between *conjunctive wh*-clauses (CWH’s) and *disjunctive wh*-clauses (DWH’s). In general, it is the latter type of *wh*-clause which has been the focus of most grammatical research which I am aware of, probably because of the fundamental importance of sequences of information-seeking questions and their answers in the world’s grammars, and because of the fact that it is always DWH’s which occur in such pairs.

The distinction between the two types has a semantic basis: in CWH’s, the speaker (or someone in the sentence) knows (or is presupposed to know) the “answer” to the question: a CWH is a kind of factive clause. In DWH’s, by contrast, there is a presupposition that this knowledge is not available (to some relevant person).

Possibly a quick example will clarify the distinction that I want to draw. In (1), we are dealing with CWH’s; in (2), with DWH’s.

- (1)    a. Who Sandor photographed  
      b. Where he developed the film  
      c. What they shot at him with                      is fantastic to the kids.  
      d. How much he was paid for the negatives  
      e. Why he wants to write it all up
- (2)    a. Who Sandor photographed  
      b. Where he developed the film  
      c. What they shot at him with                      is a mystery to the kids.  
      d. How much he was paid for the negatives  
      e. Why he wants to write it all up

What I mean by saying that the “answer” to a CWH such as the one we see in (1a) is known to someone (in this case, the kids) is that the kids would know, for each person who Sandor could have photographed, that he *did* photograph them. Thus (1a) means something like “It is fantastic to the kids that Sandor photographed Mel, that he photographed Alice, that he photographed Mr. Plankton, . . . ,” given an additional presupposition of exhaustiveness, whose function is to exclude a continuation like “. . . but the kids don’t know whether Sandor photographed Justin or not.” In other words, the kids have total information about each of the issues touched on in (1) – who was photographed, the site of the developing, the weapons that each photographee shot at Sandor with, the price that he got for selling the negatives, his reason for wanting to write up a report. (1) is an extremely compressed way of asserting that the kids have an enormous amount of information about Sandor’s photographic activities. To be blunt: the kids have *total* information.

The reason that I have chosen to distinguish the two types of *wh*-clauses with the terms “conjunctive” and “disjunctive” is because of the types of appositive phrases which each can be followed by. Thus the *who* of (1a) can be followed by a conjoined NP (cf. (3)), while the *who* of (2a) cannot be (cf. \*(4)).

- (3) a. Who – Harold Lloyd and Mae West – Sandor photographed is fantastic.  
 b. Who Sandor photographed – Harold Lloyd and Mae West – is fantastic.  
 c. ?Who – Harold Lloyd or Mae West – Sandor photographed is fantastic.  
 d. ?Who Sandor photographed – Harold Lloyd or Mae West – is fantastic.
- (4) a. \*Who – Harold Lloyd and Mae West – Sandor photographed is a mystery.  
 b. \*Who Sandor photographed – Harold Lloyd and Mae West – is a mystery.  
 c. Who – Harold Lloyd or Mae West – Sandor photographed is a mystery.  
 d. Who Sandor photographed – Harold Lloyd or Mae West – is a mystery.

While it is clear that predicates like *fantastic* (other examples of similar predicates will follow; the impatient reader will find that the Kiparskys’ class of emotive predicates all work like *fantastic* (cf. Kiparsky and Kiparsky (1971)) prefer to occur with appositives in *and*, and disjunctive question predicates like *mystery* with *or*, when we try to mix the examples, we find an interesting asymmetry. In \*(4a,b) we find an absolute bar against a disjunctive question being followed by *and*, while the success of following the *who* of a conjunctive question with an *or*-phrase seems to depend on speakers’ intuitions about whether disjunctions are “factive enough” to be in the complements of emotive factives like *fantastic*.

For me, the vagueness of what Sandor photographed, which derives from the *or* which disjoins the NP’s in (5), does not totally unfit (5) for use as the complement of such predicates (cf. (6)).

- (5) Sandor photographed Harold Lloyd or Mae West.  
 (6) ? That Sandor photographed Harold Lloyd or Mae West is fantastic.

However, if the *or* disjoins clauses, I draw the line. Cf. (7) and \*(8).

- (7) Sandor is sick or his phone is off the hook.  
 (8) a. \*That Sandor is sick or his phone is off the hook is fantastic.  
 b. ? The fact that Sandor is sick or his phone is off the hook is fantastic. ≥  
 c. ?? The fact that either Sandor is sick or his phone is off the hook is fantastic.

My problem with ?(8b), which is intensified for \*(8a), is that the situation with Sandor is not resolved enough to feel *factual* to me. Strangely enough, I have less of a problem with sentences like (9):

- (9) ? The fact that somebody may have stolen something riles everyone.

The whole phenomenon is total murk to me; I merely mention it in the hopes that a future semantactic daredevil will take up this banner I leave fallen on the field of honor. It is clear that it will not be until we are very clear as to what is to be said about these sentences that we will really understand what factives are.

I do not hope to resolve this difficult issue here, only to point out its existence, because upon its resolution will depend how we are to treat sentences like ?(3c,d).

Let us return to the main topic, which is the distinction between conjunctive and disjunctive *wh*-clauses. We have already seen one area – the choice of conjunction in appositive phrases – in which CWH's differ from DWH's. Let us examine some more. In (9), we see that only CWH's allow the word *namely* to introduce the appositive phrase:

- (9) a. It was a surprise **who** was on the panel – (namely,) Ted Foster and Richard Pryor.  
 b. It was a mystery **who** was on the panel – (\*namely,) Ted Foster or Richard Pryor.

Let us next note that the choice of *and* or *or* in appositive phrases behaves the same, whether the phrase is in apposition to the question word *who*, or to any other question word. Cf. the examples of this same distinction for a selection of other question words (in boldface) in (10) – (14).

- (10) a. It was a surprise **what** this cake was made of – (namely,) grapes and/?or bananas.  
 b. It was a mystery **what** this cake was made of – (\*namely,) grapes or/\*and bananas.
- (11) a. It was a surprise **where** he took his cousins – (namely,) to Austin and/?or to Katmandu.  
 b. It was a mystery **where** he took his cousins – (\*namely,) to Austin or/\*and to Katmandu.
- (12) a. It was a surprise **how long** Felicia stayed underwater yesterday – (namely,) 8 minutes and/?or 12 minutes.  
 b. It was a mystery **how long** Felicia stayed underwater yesterday – (\*namely,) 8 minutes or/\*and 12 minutes.
- (13) a. It was a surprise **when** Sheila had sneaked off to Arkansas – (namely,) in March and/?or in September.  
 b. It was a mystery **when** Sheila had sneaked off to Arkansas – (\*namely,) in March or/\*and in September.
- (14) a. It was a surprise **why** he finally decided to report the accident – (namely,) because of guilt and /??or because of fear of losing his insurance.  
 b. It was a mystery **why** he finally decided to report the accident – (\*namely,) because of guilt or/\*and because of fear of losing his insurance.

Before moving to other ways in which CWH's and DWH's are different internally, let me give three lists of classes of predicates which behave differentially with respect to the way that they select for different types of embedded *wh*-clauses. The first group, in (15A), is like *fantastic* and *surprise* in only occurring with CWH's. The second group, in (15B), only accepts DWH's (but see below for more discussion of this claim), while the third group, in (15C), can occur with either type of question.

(15)	A. Only CWH's	B. Only DWH's	C. Both types
	surprise	wonder	know, etc. <sup>2</sup>
	surprising	mystery	say
	interest	mysterious	write
	interesting	ask	read
	horrify	enquire	show
	horrifying, etc. <sup>1</sup>	question	guess
	flabbergast	unclear	explain
	fantastic	unknown	find out
	wild		discover
	odd		clear
	curious		evident
	memorize (?)		obvious
	realize		known
	object to		
	approve of		
	significant		
	meaningful		

We will return to study these lists in some detail below, but first, let us examine some more of the internal differences in the structures of CWH's and DWH's.

(16)	Phenomenon	In CWH's	In DWH's
	a. <i>the hell</i> , etc.	impossible (cf. *(17a))	possible (cf. (17b))
	b. <i>whether</i>	impossible (cf. *(18a))	possible (cf. (18b))
	c. <i>as to</i>	impossible (cf. *(19a))	possible (cf. (19b))
	d. negative polarity items <sup>3</sup>	impossible (cf. *(20a))	possible (cf. (20b))
	e. <i>either/whether</i> OK	<i>either</i> / * <i>whether</i> (cf. *(21a))	* <i>either</i> / OK <i>whether</i> (cf. (21b))
(17)	a. *I realize where [the hell / in hell / the devil / the fuck / on earth / in the world / in God's name] Mike has gone.		
	b. I wonder where [the hell / in hell / the devil / the fuck / on earth / in the world / in God's name] Mike has gone.		
(18)	a. *It is surprising to me whether (or not) she has left.		
	b. It is mysterious to me whether (or not) she has left.		
(19)	a. *It's wild as to who left with whom.		
	b. It's not clear as to who left with whom.		
(20)	a. It's fantastic when we (*ever) will be able to buy (*any) snakes.		
	b. It's unclear when we (ever) will be able to buy (any) snakes.		

- (21) a. How long a sentence he'll get – [either / \*whether] 20 or 30 years – is surprising.  
 b. \*How long a sentence he'll get – [\*either / whether] 20 or ((?) whether) 30 years – is a mystery.

Added to the differences in behavior with respect to the choice of *and* versus *or* (cf. (3) versus \*(4), and (10) – (14)) and the behavior of *namely* (cf. (9) – (14)), the five kinds of differences manifested in examples (17) to (21) give us a total of seven ways in which the two types of *wh*-clauses manifest internal differences in syntactic behavior. I would like to highlight one of these seven ways as fundamental – the behavior of negative polarity items (NPI's), such as *any* and *ever*. NPI's get their name from such contrasts as those in (22), in which we see that it is negative morphemes like *not*, *no*, and *few* which permit their occurrence.

- (22) a. The extraterrestrials may (\*ever) give you (\*any) hamsters.  
 b. The extraterrestrials may not (ever) give you (any) hamsters.  
 c. No extraterrestrials may (ever) give you (any) hamsters.  
 d. Few extraterrestrials may (?ever) give you (?any) hamsters.

I see the fact that DWH's permit the occurrence of NPI's as a possible key to the distribution of CWH's and DWH's in the lists of (15), for differences of negativity in the matrix sentences are a major factor in the choice of what kind of *wh*-clause will be able to occur with a predicate, as we see when we examine the predicates in (15C). These predicates occur with both kinds of *wh*-clauses, depending in part on the presence of negative elements, as we see when we compare (23) and (24).

- (23) a. I came to know how long a sentence he'll get – [either/\*whether] 20 or 30 years.  
 b. I don't know how long a sentence he'll get – [\*either/whether] 20 or 30 years.
- (24) a. The lawyers know how (??the hell) he got off so lightly.  
 b. No lawyers know how (the hell) he got off so lightly.

We see from (23a) that by itself, *know* behaves like a CWH – its *wh*-word can be followed by an appositive in *either* but not by one in *whether*. However, as soon as we insert a negative trigger like *not*, this behavior reverses itself. Similarly, (24) suggests that *know* by itself should be classified as selecting for CWH's, for such "irritatives" – i.e., post-question-word modifiers like *the hell* – seem unnatural, unless a negative trigger like *no* is present.

This same conclusion, about the centrality of negation as a conditioning factor in the ecology of *wh*-clause types, is suggested when we note that *clear* is in (15C), because whether it occurs with CWH's or DWH's depends on the nature of the clause in which it occurs – cf. (25).

- (25) a. It became clear who (\*in God's name) was running the show.  
 b. It never became clear who (in God's name) was running the show.

However, *unclear* appears in (15B), because it has all the earmarks of any other DWH, as suggested by (26).

- (26) It is unclear (as to) where (on earth) we will (ever) find back issues of *The Realist*.

But the prefix *un-* has some of the same NPI-triggering properties as clearly negative elements like *not*, *no*, and *few*, as we see in (27).

- (27) a. It was \*(un)clear to me that any gardener ever stole any bulbs.  
 b. It was \*(not) clear to me that any gardener ever stole any bulbs.  
 c. It was \*(never) clear to me that any gardener ever stole any bulbs.

Armed with the hypothesis that one crucial aspect of the external conditioning of the CWH / DWH contrast involves negation, let us return for a closer look at the predicates in (15B). What we will find is that while it is usually the case that the predicates in (15B) occur with DWH's, almost all of them can, with sufficient persuasion, also be found occurring with CWH's. Starting with *unclear*, we see in (28a) that it seems to occur with *or*, and to reject *and*. However, if *unclear*, whose prefix *un-* we saw above to have negational properties, occurs with a second negative trigger, as in (28b), we see it switch its preference for *or* to one for *and*.

- (28) a. It was unclear who he liked best – Zélia [or / \*and] Eris.  
 b. It was never unclear who he liked best – Zélia [and/?or] Eris.

Similarly, while *know* with one negative trigger admits DWH's (cf. (29a)), a second negative trigger makes these awkward – cf. (29b).

- (29) a. Few people know how the hell to change a tire.  
 b. Few people don't know how (?the hell) to change a tire.

Thus we see that with respect to the CWH / DWH choice, classical negative triggers like *not*, *no*, *never*, *few*, and so on function in the same way as the negative prefix *un-*. We might then wonder whether the choice can be influenced by negative elements which are not present as morphemes, but which are a part of the semantic representation of an element.

Let us examine *mystery* and *mysterious*, whose meanings, it would seem to me, must contain “not know,” as we can see from the anomaly of contradicting this part of their meanings, as in (30):

- (30) ? It is [a mystery / mysterious] to Zeb as to who went, but he knows who went.

In addition, *mystery* / *mysterious* seem to suggest that it is difficult to attain the knowledge, or possibly even that others have tried in the past. Note in this connection the oddity of using these words in the future tense:

- (31) ? It will be a mystery as to who went.

Leaving, however regretfully, such refinements aside, let us return to the issue at hand: what happens when the semantically implicit negation “inside” *mystery* / *mysterious* is supplemented syntactically by an additional exterior negative element. In (32a), we see the implicit negative generating such expected earmarks of DWH's as the italicized elements following *mystery*. But in (32b), in the presence of the additional negative element *no*, the wh-clause has come to present all the characteristics of a CWH.

- (32) a. It is a mystery as to who in the world would ever have sent such a ridiculous card – one of my colleagues [or / \*and] a disgruntled former

- student.
- b. It is no mystery (?as to) who (\*in the world) would (\*ever) have sent such a ridiculous card – one of my colleagues [?or / and] a disgruntled former student.

And in (33), we see the same phenomenon repeated for *mysterious*:

- (33) a. It was always mysterious how (on earth) he managed to earn any money whatsoever.  
 b. It was never mysterious how (\*on earth) he managed to earn (\*any) money (\*whatsoever).

It would appear that we have here one of the areas in which something applies like the law (in certain logics) of cancellation of double negation – [  $\neg\neg p = p$  ]. There are other cases in the complex ecology of negation where this cancellation appears to be possible, one of them being within parenthetical inserts (cf. (34)),

- (34) a. Gal is, I think, a great artist.  
 b. \*Gal is, [I don't think / I doubt], a great artist.  
 c. Gal is, [I don't doubt / \*nobody doesn't think], a great artist.

but the area is so complex that I have already exhausted all that I can say about it with any certainty. The interested reader should consult Horn (1990). I propose to hot-potato the topic for the present discussion of the interaction of negation and the CWH / DWH choice, after one final observation.

It might be thought, since (at least some of) the predicates in (15B) can be made to appear like those of (15C), under the addition of negative elements, that then this might also apply to the predicates in (15A) – that negating them might force them to change their wh-clause selection from CWH to DWH. What I find extremely interesting, albeit inexplicably so, is that this appears never to happen. That is, (35a), whose predicate is the emotive factive *surprise*, cannot be induced with any negative equipment, at least not with any that I have been able to devise, to change its spots (cf. (35b) – (35d)):

- (35) a. It surprised me where (\*the hell) you worked as an industrial spy – Martha's Vineyard and / ?or Ocracoke.  
 b. It didn't surprise me where (\*the hell) you worked as an industrial spy – Martha's Vineyard and / ?or Ocracoke.  
 c. It never surprised me where (\*the hell) you worked as an industrial spy – Martha's Vineyard and / ?or Ocracoke.  
 d. Nobody was surprised where (\*the hell) you worked as an industrial spy – Martha's Vineyard and / ?or Ocracoke.

I find this perplexing, since the *surprise*-class (cf. fn. 2) also seems to have in its semantics some kind of implied negative. That is, all of the elements in the *surprise*-class seem to contain an implicature, or possibly even an entailment, of a thwarted expectation. Thus *that S surprised Hannah* seems to have in its meaning somewhere “Hannah would have expected that not S.” This negative expectation can trigger NPI's, as we see in (36), where they appear in italics.

- (36) It surprised me that *anybody* would *ever* have *lifted a finger* to aid Aline.

Interestingly, an extra syntactic negation here annuls *surprise's* ability as a negative trigger:

- (37) a. \* It didn't surprise me that *anybody* would *ever* have *lifted a finger* to aid Aline.  
 b. \* It surprised nobody that *anybody* would *ever* have *lifted a finger* to aid Aline.  
 c. \* It never surprised me that *anybody* would *ever* have *lifted a finger* to aid Aline.  
 d. \* Nobody was surprised that *anybody* would *ever* have *lifted a finger* to aid Aline.

So my question is: why is it that (something cognate to) the law of cancellation of double negations works in the *surprise*-class for NPI's, but not for the choice of CWH versus DWH? I will have to leave this question for future research, but already we can see that what might be taken as a kind of syntactic null hypothesis – namely, that what I have been calling “the earmarks of DWH's” are nothing other than NPI's – this hypothesis will have to be abandoned, because double negation has different effects on DWH's than on more familiar NPI's.

Let us return to our primary topic: the external environment which conditions the choice between CWH's and DWH's. We have already seen that some of the predicates in (15B) admit of a reanalysis – those which either contain a negation morphologically, in the form of the negative prefix *un-* [i.e., the two words *unclear* and *unknown*], or which contain an implicit semantic negation (*mystery* and *mysterious*). Since some of the class of predicates in (15B) can be reunderstood as being due to an interaction with the semantax of negation, the question suggests itself as to whether the other predicates in (15B) would admit of something similar. The answer, I think, is yes – and the “something similar” would appear to be connected to the traditional contrast between realis and irrealis (cf. Comrie 1976, Karttunen 1971, Noonan 1985).

One example of this contrast would be a pair of verbs such as *succeed* versus *try*. The former verb belongs to a class which Karttunen has named “implicative verbs,” verbs which in the affirmative imply the success of the action denoted by the complement. Thus if Terry succeeded in drying the onions is true, so is Terry dried the onions. With *try (to)*, the situation is almost the reverse: Terry tried to dry the onions being true conversationally implies that Terry dried the onions is false, though the implicature is cancellable – cf. *Terry tried to dry the onions, and finally managed to*. The contrast between realis and irrealis shows up in different kinds of distinctions in the world's languages, probably most popularly in verbal morphology, but also in the choice of types of article and other areas of grammar.

What is relevant for our present discussion is the fact that the CWH / DWH distinction is linked to the realis / irrealis distinction, as we can see in (38).

- (38) a. Cinelândia succeeded in discovering where (\*the hell) they were living.  
 b. Cinelândia tried to discover where (the hell) they were living.

Irrealis predicates like *try*, *attempt*, *avoid*, *prevent*, *preclude*, *wish*, etc. imply a lack of success, and it may be that this lack is semantically close enough to a (grammatical) negative that English allows the two notions to combine in the conditioning of DWH's.

I believe it to be the case, though I have not studied the matter enough yet, that it is the same combination – {negation and/or irrealis} – which is responsible for the choice in interpretation of indefinites between specific and non-specific indefinites. Thus note that in (39a), the NP *a house* refers to one specific house, whereas this is not the case in either (39b), in which *a house* is in the scope of a



negative, nor in (39c) or (39d), in which it is in the scope of irrealis verbs:

- (39) a. Ted built a house.  
 b. Ted didn't build a house.  
 c. Ted tried to build a house.  
 d. Ted wished that he had built a house.

The notion of desire is also linked to the notion of irrealis. To say that Francine wants Tex to buy her painting is to conversationally imply that Tex has not yet bought Francine's painting. And while it is true that (40a) does not imply (40b), thus (40c) being by no means contradictory,

- (40) a. Sandra wanted the Grifters to sing.  
 b. The Grifters didn't sing.  
 c. Sandra wanted the Grifters to sing and they sang.

still there is some faint suggestion in (40a) that the Grifters didn't sing, a suggestion that is strengthened by placing more stress on the complement of *want*, as in (41a), than on *want* itself, as in (41b):

- (41) a. Sandra wanted the Grifters to SING (? , and they did).  
 b. Sandra WANTED the Grifters to sing ( , and they did).

It may be that it will prove helpful to recognize various degrees of irrealis, and to postulate that *try* is more of an irrealis predicate than is *want*. At my present level of ignorance about this question, I can only leave all analytic options open. Nevertheless, what is relevant in the present context is that *want* conditions the occurrence of DWH's, while realis predicates, like *manage*, exclude DWH's. Thus (42a), whose embedded wh-clause necessarily has the interpretation of a DWH, forced by the presence of the irritative *in the name of God*, is ungrammatical, while the (possibly small amount of) irrealis in *want* in (42b) allows the construction to go through.

- (42) a. \*We managed to discover how in the name of God they had untied our shoes.  
 b. We wanted to discover how in the name of God they had untied our shoes.

Returning now to the predicates in (15B), it appears likely to me that a plausible notional analysis of *wonder* and *ask* will postulate the existence of some predicate of desire as a building block of the meanings of these two verbs. That is, *wonder* ( $x, y$ ) would be analyzed in part as "*want* ( $x$ ) [*know* ( $x, y$ )]," and *ask* ( $x, y, z$ ) as "*request* ( $x, y$ ) [*tell* ( $y, x, z$ )]." Note for this latter decomposition that we do not request things that are not desired. I suspect that it is the presence of the element of desire which causes these two verbs to normally exclude any type of wh-clause except DWH's, although, as we will see shortly, it is possible to override this default preference under certain conditions. Before we examine these conditions in detail, however, let us take a look at the behavior of the sentential pronoun *it*, especially with respect to the way it behaves when it refers to embedded wh-clauses.

*it* versus  $\emptyset$  as proforms for embedded questions

For certain predicates, *it* can only replace a conjunctive wh-clause which is identical to another conjunctive wh-clause, as will be seen in (43). In the following

sets of examples, I have appended to each sentence an indication as to what type of *wh*-clause can appear in the first clause (the *wh*-clause which is enclosed in square brackets subscripted by 'i' – i.e., [<sub>i</sub>]), as well as the type of interpretation that is allowed in the following clause, for the two types of pronominal element – *it* and  $\emptyset$ . Thus the subscripted 'CWH' after the embedded *wh*-clauses in the first clauses of (43a,b) indicates that these clauses are to be interpreted conjunctively, and the subscripts on the following pronominal elements also serve to indicate how they are to be interpreted, with their (un)grammaticalities being indicated by '\*', '?', and so on, as usual. In order to force the desired interpretation of the non-pronominalized *wh*-clause, I will insert boldfaced items which I have argued to be linked to one of the two poles – in the case of CWH's, I will use *namely* and appositives in *and*, and in the case of DWH's, I will use *whether or not*.

- (43) a. First *wh*-clause CWH – second *wh*-clause CWH  
 She discovered [how much ale Peter had drunk – namely, one quart]<sub>i</sub> (CWH) – and Tim knew [it<sub>i</sub> (CWH) /  $\emptyset$ <sub>i</sub> (CWH)] too.
- b. First *wh*-clause CWH – second *wh*-clause DWH  
 She discovered [how much ale Peter had drunk – namely, one quart]<sub>i</sub> (CWH) – even though Tim never knew [**\*it<sub>i</sub>** (DWH) /  $\emptyset$ <sub>i</sub> (DWH ok)].
- c. First *wh*-clause DWH – second *wh*-clause CWH  
 She is trying to discover [whether or not Peter drinks ale]<sub>i</sub> (DWH), and I bet that Tim knows [**\*it<sub>i</sub>** (CWH) /  $\emptyset$ <sub>i</sub> (ok CWH)].
- d. First *wh*-clause DWH – second *wh*-clause DWH  
 She is trying to discover [whether or not Peter drinks ale]<sub>i</sub> (DWH), but I bet that Tim doesn't know [**\*it<sub>i</sub>** (DWH) /  $\emptyset$ <sub>i</sub> (ok CWH)].

Let me comment on the sentence which I find most unusual – (43b). By my indication that a disjunctive *wh*-clause interpretation of the  $\emptyset$ -pronoun is grammatical, I mean to say not that this sentence can be interpreted as in (44a), but rather that it can mean what (44b) means.

- (44) a. She discovered [how much ale Peter had drunk – namely, one quart]<sub>i</sub> (CWH) – even though Tim never knew [how much ale Peter had drunk – namely, one quart].
- b. She discovered [how much ale Peter had drunk – namely, one quart]<sub>i</sub> (CWH) – even though Tim never knew [how much ale Peter had drunk].

I take this to mean that there should be a sentence node dominating the string *how much ale Peter had drunk* in the first clause of (43b), so that the  $\emptyset$ -object of *knew* in the second clause of (43b) can refer back to a constituent, but I will avoid details of constituent structure at the moment.

What do we learn from the data in (43)? The most obvious thing is that *it* is restricted, while  $\emptyset$ , at least in these contexts, is not. We find *it* comfortably only in (43a), where this pronoun is interpreted as the conjunctive *wh*-clause complement of its predicate, and where *it* refers back to a CWH. In (43c), where only the first of these conditions is met, anaphora with *it* is very weak, if possible at all; and in (43b), where only the second condition is met, we also see an impossible anaphoric link.

At this point, let me introduce some data which concern the nature of negative polarity violations. In general, they seem to be linked to audibility, as we can see from (45):

- (45) a. \*Mike doesn't have any<sup>1</sup> money, but I do have any<sup>2</sup> money.  
 b. Mike doesn't have any<sup>1</sup> money, but I do.

The badness of (45a) is attributable to the fact that *any*<sup>2</sup> is not in a negative environment – the *not* of the first clause of (45a) does not command it. However, in (45b), in which this unlicensed *any* does not appear, the sentence is much improved (for me, it becomes grammatical). Thus we might conclude that polarity violations are surface structure filters. The facts, for me, at least, indicate a larger morass, however: while *any* is a weak NPI, one which can be triggered by questions, by *if*, by *too*, etc., as well as by negative triggers (cf. (46)),

- (46) a. \*Tex has any money.  
 b. Does Tex have any money?  
 c. If Tex has any money, he can bail Monty out.  
 d. Tex is too big a spender to have any money.  
 e. Tex never has any money.

there are other NPI's – so-called “strong” NPI's – which are choosier, and which are not licensed by anything but negatives – *exactly* is one such.

- (47) a. \*Tex is exactly a liberal.  
 b. \*Is Tex exactly a liberal?  
 c. \*If Tex is exactly a liberal, he can run for governor.  
 d. \*Tex is too cunning to be exactly a liberal.  
 e. Tex never was exactly a liberal.

This means that only certain polarity violations are audibility-linked – only those involving weak polarity items. The problems caused by polarity have spawned a whole subfield in semantax, which I will not attempt to survey here (cf. Israel (in press), for an excellent and penetrating treatment); I bring up the matter because it appears that some of the violations caused by the conjunctive/disjunctive contrast may also be audibility-linked. Consider the sentences in (48).

- (48) a. \*Janet couldn't discover where the hell the chips were, but Ed knew where the hell they were – namely, in the freezer.  
 b. Janet couldn't discover where the hell the chips were, but Ed knew (? – namely, in the freezer).  
 c. \*I don't know how long a sentence Tony will get – [whether 20 or 30 years] – but Edna knows how long a sentence Tony will get – [whether 20 or 30 years].  
 d. I don't know how long a sentence Tony will get – [whether 20 or 30 years] – but Edna knows.

I will not tarry to propose a solution to the many problems that are raised in (48), for I want to return to the how the choice of a proform for embedded wh-clauses impacts upon the conjunctive / disjunctive contrast, the matter that I started to explore in (43).

As soon as we widen the set of data in (43), we encounter many complications, some caused by lexical differences in anaphoric patterning. For instance, when *figure out* is substituted for *know* in the sentences in (43), we note that aside from the

fact that *figure out* can apparently never appear with a zero pronoun  $\emptyset$  in the place of its object, there is also a difference with respect to how an *it* which follows this verb may be interpreted. To my ear, with *figure out*, a pronominal object can refer to either a conjunctive or a disjunctive *wh*-clause. Thus while *it* can follow *know* under only one of the four cases in (43), to my ear, *it* can follow *figure out* under three of the four – cf. (49).

(49) a. First *wh*-clause CWH – second *wh*-clause CWH

She discovered [how much ale Peter had drunk – namely, one quart]<sub>i</sub> (CWH) – and Tim figured [it<sub>i</sub> (CWH) / \* $\emptyset$ <sub>i</sub> (CWH)] out too.

b. First *wh*-clause CWH – second *wh*-clause DWH

She discovered [how much ale Peter had drunk – namely, one quart]<sub>i</sub> (CWH) – even though Tim never figured [it<sub>i</sub> (DWH) / \* $\emptyset$ <sub>i</sub> (CWH)] out .

c. First *wh*-clause DWH – second *wh*-clause CWH

She will try to discover [whether or not Peter drinks ale]<sub>i</sub> (DWH), and I bet that Tim will figure [\*it<sub>i</sub> (CWH) / \* $\emptyset$ <sub>i</sub> (CWH)] out. [This string of words is grammatical, of course, but I think only as (49d). That is, I cannot imagine what a conjunctive interpretation of the *whether*-clause would be.]

d. First *wh*-clause DWH – second *wh*-clause DWH

She will try to discover [whether or not Peter drinks ale]<sub>i</sub> (DWH) , but I bet that Tim will never figure [it<sub>i</sub> (DWH) / \* $\emptyset$ <sub>i</sub> (DWH)] out.

I have yet to discover what is behind the differences between (43) and (49). For instance, it is not the case that all verbs which take particles exclude zero pronouns *find out* accepts them, though for me, this verb can never take an *it* object which refers to a sentential complement, whether DWH or not. As with zero pronouns after *know*, zero pronouns after *find out* can refer to either type of embedded *wh*-clause. Below, in (50), I present a small set of data which result from substituting, *mutatis mutandis*, other predicates for *know* and *figure out* in sentences like those in (43) and (49). Below each predicate I give in parentheses the example number where I present the data on which (50) is based. The first grammaticality indication in each cell is for *it*, and the second for zero pronominalization.

(50) Anaphoric linkages between [*it* /  $\emptyset$ ] and various types of *wh*-clauses

Predicate:	<i>learn</i> (51)	<i>report</i> (52)	<i>remember</i> (53)	<i>reveal</i> (54)	<i>find out</i> (55)	<i>clear, evident</i> (56)
a.CWH – CWH	*/??	OK/*	OK/OK	OK/*	*/OK	OK/DNA <sup>4</sup>
b.CWH – DWH	*/??	*/*	*/OK	?/*	*/OK	OK/DNA
c.DWH – CWH	*/*	*/*	*/*	*/*	*/*	*/DNA
d.DWH – DWH	*/??	*/*	*/OK	??/*	*/OK	OK/DNA

- (51) a. First *wh*-clause CWH – second *wh*-clause CWH  
 She discovered [how much ale Peter had drunk – namely, one quart]<sub>i</sub> CWH) – and I bet that Tim will learn [ $??\emptyset_i$  (CWH) /  $*it_i$  (CWH)] too.
- b. First *wh*-clause CWH – second *wh*-clause DWH  
 She discovered [how much ale Peter had drunk – namely, one quart]<sub>i</sub> CWH) – even though Tim never learned [ $*it_i$  (DWH) /  $??\emptyset_i$  (DWH)].
- c. First *wh*-clause DWH – second *wh*-clause CWH  
 She is trying to discover [whether or not Peter drinks ale]<sub>i</sub> (DWH), and I bet that Tim has learned [ $*it_i$  (CWH) /  $*\emptyset_i$  (CWH)] already. [Again, as with (49c), this string of words is grammatical, but I think only as (51d).]
- d. First *wh*-clause DWH – second *wh*-clause DWH  
 She is trying to discover [whether or not Peter drinks ale]<sub>i</sub> (DWH), and I bet that Tim hasn't learned [ $*it_i$  (DWH) /  $??\emptyset_i$  (DWH)] yet either.
- (52) a. First *wh*-clause CWH – second *wh*-clause CWH  
 She discovered [how much ale Peter had drunk – namely, one quart]<sub>i</sub> (CWH) – and Tim reported [ $it_i$  (CWH) /  $*\emptyset_i$  (CWH)] to us.
- b. First *wh*-clause CWH – second *wh*-clause DWH  
 She discovered [how much ale Peter had drunk – namely, one quart]<sub>i</sub> (CWH) – even though Tim never reported [ $*it_i$  (DWH) /  $*\emptyset_i$  (DWH)] to us.
- c. First *wh*-clause DWH – second *wh*-clause CWH  
 She is trying to discover [whether or not Peter drinks ale]<sub>i</sub> (DWH), and I bet that Tim will report [ $*it_i$  (CWH) /  $*\emptyset_i$  (CWH)] to us.
- d. First *wh*-clause DWH – second *wh*-clause DWH  
 She is trying to discover [whether or not Peter drinks ale]<sub>i</sub> (DWH), but I bet that Tim won't report [ $*it_i$  (DWH) /  $*\emptyset_i$  (DWH)] to us.
- (53) a. First *wh*-clause CWH – second *wh*-clause CWH  
 She discovered [how much ale Peter had drunk – namely, one quart]<sub>i</sub> (CWH) – and Tim will remember [ $it_i$  (CWH) /  $\emptyset_i$  (CWH)].
- b. First *wh*-clause CWH – second *wh*-clause DWH

She discovered [how much ale Peter had drunk – namely, one quart]<sub>i</sub> (CWH) – even though Tim didn't remember [ $*it_i$  (DWH) /  $\emptyset_i$  (DWH)].

- c. First *wh*-clause DWH – second *wh*-clause CWH

She is trying to discover [whether or not Peter drinks ale]<sub>i</sub> (DWH), and I bet that Tim remembers [ $*it_i$  (CWH) /  $*\emptyset_i$  (CWH)]. [Again, as with (49c), and (51c), this string of words is grammatical, but I think only as (53d).]

- d. First *wh*-clause DWH – second *wh*-clause DWH

She is trying to discover [whether or not Peter drinks ale]<sub>i</sub> (DWH), but I bet that Tim doesn't remember [ $*it_i$  (DWH) /  $\emptyset_i$  (ok DWH)].

- (54) a. First *wh*-clause CWH – second *wh*-clause CWH

She discovered [how much ale Peter had drunk – namely, one quart]<sub>i</sub> (CWH) – and Tim revealed [ $it_i$  (CWH) /  $*\emptyset_i$  (CWH)].

- b. First *wh*-clause CWH – second *wh*-clause DWH

She discovered [how much ale Peter had drunk – namely, one quart]<sub>i</sub> (CWH) – even though Tim never revealed [ $?it_i$  (DWH) /  $*\emptyset_i$  (DWH)].

- c. First *wh*-clause DWH – second *wh*-clause CWH

She is trying to discover [whether or not Peter drinks ale]<sub>i</sub> (DWH), and I bet that Tim will reveal [ $*it_i$  (CWH) /  $*\emptyset_i$  (CWH)]. [Again, as with (49c), (51c), and (53c), this string of words is slightly grammatical, but I think only as (54d).]

- d. First *wh*-clause DWH – second *wh*-clause DWH

She is trying to discover [whether or not Peter drinks ale]<sub>i</sub> (DWH), but I bet that Tim won't reveal [ $??it_i$  (DWH) /  $*\emptyset_i$  (DWH)].

- (55) a. First *wh*-clause CWH – second *wh*-clause CWH

She discovered [how much ale Peter had drunk – namely, one quart]<sub>i</sub> (CWH) – and Tim found [ $*it_i$  (CWH) /  $\emptyset_i$  (ok CWH)] out too.

- b. First *wh*-clause CWH – second *wh*-clause DWH

She discovered [how much ale Peter had drunk – namely, one quart]<sub>i</sub> (CWH) – even though Tim never found [ $*it_i$  (DWH) /  $\emptyset_i$  (ok DWH)] out.

- c. First *wh*-clause DWH – second *wh*-clause CWH

She is trying to discover [whether or not Peter drinks ale]<sub>i</sub> (DWH), and I

bet that Tim is going to find [ $*it_i$  (CWH) /  $*\emptyset_i$  (ok CWH)] out. [Again, as with (49c), (51c), (53c) and (54c), this string of words is grammatical, but I think only as (55d).]

- d. First question DWH – second question DWH

She is trying to discover [whether or not Peter drinks ale]<sub>i</sub> (DWH), but I bet that Tim won't find [ $*it_i$  (DWH) /  $\emptyset_i$  (ok DWH)] out.

- (56) a. First question CWH – second question CWH

She discovered [how much ale Peter had drunk – namely, one quart]<sub>i</sub> (CWH) – and [ $it_i$  (CWH) / DNA] was {clear, evident} to Al too.

- b. First question CWH – second question DWH

She discovered [how much ale Peter had drunk – namely, one quart]<sub>i</sub> (CWH) – but [ $it_i$  (DWH) / DNA] was never {clear, evident} to Al.

- c. First question DWH – second question CWH

She is trying to discover [whether or not Peter drinks ale]<sub>i</sub> (DWH), and I think that [ $*it_i$  (CWH) / DNA] is {clear, evident} to Al already. [Again, as with (49c), (51c), (53c), (54c) and (55c), this string of words is grammatical, but I think only as (56d).]

- d. First question DWH – second question DWH

She is trying to discover [whether or not Peter drinks ale]<sub>i</sub> (DWH), but I bet that [ $it_i$  (DWH) / DNA] isn't {clear, evident} to Al.

The data summarized in (50) indicate that two of the predicates with clausal objects (namely, *report* and *remember*) are like *know* in allowing an object pronoun *it* to follow them only under the condition that this pronoun be interpreted as a conjunctive question, with the additional condition that the clause referred to also be a conjunctive question. Other predicates (e.g., *reveal* and adjectives with subject complements (cf. (56))) do not have such absolute restrictions, and *figure out* (cf. (49)) seems to have no link to conjunctiveness whatsoever. Nor have I found any link between  $\emptyset$ -object pronouns and the CWH / DWH distinction. Since I have thus far only collected data for a small number of predicates, I can only conclude with the greatest caution that there is (sometimes) a link between *it* and CWH's. It seems clear that the question as to which kinds of predicates can occur with which types of anaphoric elements merits a detailed study of its own, one which I will not be able to undertake here.

Rather, let me go on to indicate another particular case in which *it* is sensitive to the CWH / DWH distinction. As I pointed out above, with respect to examples like (32), when *no* precedes *mystery*, this noun goes from taking DWH complements to taking CWH ones. Similarly, while the *wh*-clause complement of *mystery* cannot be referred to with *it* in positive sentences (cf. (\*57a)), in the presence of the negator *no*, anaphora becomes possible – cf. (57b):

- (57) a. \*It is a mystery [who he hired]<sub>i</sub> (DWH), and his friends will probably be surprised at *it*<sub>i</sub>.

- b. It is no mystery [who he hired]<sub>i</sub> (CWH), and his friends won't be surprised at it<sub>i</sub>(CWH).

The behavior of *it* in sentential anaphora in (57) can be duplicated for any of the other predicates of (15A), which, like *surprise*, occur only with CWH's. It should be noted that the negative *won't* in (57b), like the negators in (35b) – (35d) above, do not cause the verb *surprise* to switch from behaving as an exclusively CWH-demanding predicate.

What is important about this example is that we see that one of the (15B) predicates, *mystery*, which had been classified as taking only DWH's, can switch its allegiance and take CWH's. It is no surprise to show that the same is possible for the associated adjective *mysterious*:

- (58) a. \*It was mysterious as to [where he was living]<sub>i</sub> (DWH), and his friends were probably surprised at it<sub>i</sub>.  
 b. It was never mysterious [where he was living]<sub>i</sub> (CWH), and his friends were always surprised at it<sub>i</sub>.

Let me now proceed to show that *wonder* and *ask* can also be induced to occur with CWH's, in the same kind of negative polarity contexts. Before doing so, however, let me review a fundamental insight about the grammar that is due to Peter Rosenbaum (cf. (Rosenbaum (1967))). Rosenbaum noted that often prepositions which are obligatorily lexically associated with predicates which precede nouns are either necessarily or optionally deleted when followed by various types of complements. Some examples of the type of alternation he noted are given in (59):

- (59) a. I was surprised (\*at) that you had read my paper.<sup>5</sup>  
 b. I was surprised (\*at) for you to have attacked me in the street like that.  
 c. I was surprised (at) how quickly you pulled the gun out of your microscope box  
 d. I was surprised \*(at) your having missed me at such close range.  
 e. I was surprised \*(at) your lies in the witness box.

Rosenbaum's rule of Preposition Deletion, which I will assume the correctness of, is stated in (60):

(60) Preposition Deletion

SD:	X	-	[	P	-	S	]	NP	-	Y	
	1			2		3		4			OBL →
SC:	1			∅		3		4			

Condition: Optional if 3 is a *wh*-clause  
 DNA if 3 is nounier than a *wh*-clause<sup>6</sup>

This rule will generate the data in (59) and in similar cases; let us temporarily assume its correctness. Let us see how this rule intersects with the distinction between conjunctive and disjunctive *wh*-clauses.

Up to now, we have classified the verb *wonder* as a predicate of type (15B) – one which can occur only with DWH's, a seemingly necessary decision, given such facts



as those in (61):

- (61) a. They wondered what (on earth) we had eaten.  
 b. They wondered what we had eaten – [(*\*namely*) corn or peas / *\*(\*namely)* corn and peas].  
 c. They wondered what we had eaten – [whether / *\*either*] corn or peas.

However, we note that *wonder* can also occur followed by the prepositions *about* and *at*, as in (62), where we see that it manifests more the behavior of a CWH-taking predicate:

- (62) a. They wondered [about / at] what (*\*on earth*) we had eaten.  
 b. They wondered [about / at] what we had eaten – [?(*namely*) corn or peas / (*namely*) corn and peas].  
 c. They wondered [about / at] what we had eaten – [??whether / either] corn or peas.

A further indication of this difference between *wonder* + DWH and *wonder* + [about / at] is the difference in the possibility of the complements anteceding a sentential *it* following *surprised at*:

- (63) a. *\*They* wondered [what we had eaten]<sub>i</sub> (DWH), but *you* won't be surprised at it<sub>i</sub>.  
 b. *They* wondered [about / at] [what we had eaten]<sub>i</sub> (CWH), but *you* won't be surprised at it<sub>i</sub>.

We note that there is a clear corresponding difference in the meanings of *wonder* + DWH and *wonder* + [about / at]. While the first of these means roughly “want to know,” the second means something like “be mildly surprised or concerned about.”

Now let us note that two more of the verbs in (15B), namely *ask* and *enquire*, can also be followed by *about*, with the same shift from DWH-taking to CWH-taking behavior, and with a parallel shift in meaning. In (64) – (66) and (67) – (69), respectively, we see the results of replacing *wonder* in (50) – (52) with these two verbs.

- (64) a. They asked what (on earth) we had eaten.  
 b. They asked what we had eaten – [(*\*namely*) corn or peas / *\*(\*namely)* corn and peas].  
 c. They asked what we had eaten – [whether / *\*either*] corn or peas.
- (65) a. They asked about what (*\*on earth*) we had eaten.  
 b. They asked about what we had eaten – [?(*namely*) corn or peas / (*namely*) corn and peas].  
 c. They asked about what we had eaten – [?whether / either] corn or peas.
- (66) a. *\*They* asked [what we had eaten]<sub>i</sub> (DWH), but *you* won't be surprised at it<sub>i</sub>.  
 b. *They* asked about [what we had eaten]<sub>i</sub> (CWH), but *you* won't be surprised at it<sub>i</sub>.
- (67) a. They enquired what (on earth) we had eaten.  
 b. They enquired what we had eaten – [(*\*namely*) corn or peas / *\*(\*namely)* corn and peas].  
 c. They enquired what we had eaten – [whether / *\*either*] corn or peas.

- (68) a. They enquired about what (\*on earth) we had eaten.  
 b. They enquired about what we had eaten – [(namely) corn or peas / (namely) corn and peas].  
 c. They enquired about what we had eaten – [whether / either] corn or peas.
- (69) a. \*They enquired [what we had eaten]<sub>i</sub> (DWH), but you won't be surprised at it<sub>i</sub>.  
 b. **They** enquired about [what we had eaten]<sub>i</sub> (CWH), but **you** won't be surprised at it<sub>i</sub>.

There is one difference, to my ear, between *wonder*, on the one hand, and *ask* / *enquire*, on the other. For me, the only possibility of hearing *wonder about* as having even a vestigial possibility of taking a DWH is the fact that it is not hopeless with *whether* (cf. the '??' judgement in (62c)). However, for *ask* and *enquire*, the corresponding sentences, namely (65c) and (68c), seem far better, perhaps fully acceptable, though this judgement may be off a bit. Thus it appears not to be the case that the choice between CWH and DWH is as sharp as we might like to have it be. Or, in other words, the diagnostic environments which I have suggested can be used to tease apart these two constructions do not have the same thresholds of sensitivity. Though I will not have the space here to investigate this question with the care which it requires, I suspect that the distinction between the two kinds of questions will turn out to be a squishy one.<sup>7</sup>

The semantic distinction which I alluded to above between *ask* and *enquire*, with and without [*about* / *at*], is basically parallel to that which I discussed above with *wonder*, though for me, it is not so sharp.

Now let us turn to the last of the predicates listed in (15B) – the noun/verb *question*. Most commonly, we find this lexical item used as a noun, followed by the prepositions *of* or *about*, or by the idiomatic sequence *as to*. Many speakers also allow it to directly precede the *wh*-clause which is its object, though I do not. The sentences in (70) will let us see what kinds of *wh*-clauses the noun *question* can occur with.

- (70) a. Milt succeeded in raising the question of who (?\*the hell) had been hired.  
 b. Milt succeeded in raising the question of who had been hired – namely, Petrocelli, Bonham, Mastroianni and Zurch.  
 c. Milt succeeded in raising the question of whether or not the bridge had been built.  
 d. Milt succeeded in raising the question of when the town was going to collect (?\*any) taxes.
- e. Milt tried to raise the question of who (the hell) had been hired.  
 f. Milt tried to raise the question of who had been hired – [?Petrocelli, Bonham, Mastroianni or Zurch / namely, Petrocelli, Bonham, Mastroianni and Zurch].  
 g. Milt tried to raise the question of whether or not the bridge had been built.  
 h. Milt tried to raise the question of when the town was going to collect (any) taxes.

In (70), we see that *of* is more or less neutral. In examples (70a)–(70d), with *succeeded*, we would expect *the question* to behave like a CWH, because *succeed* is a realis predicate, and this is what we get, with the exception of (70c). I have no

explanation for why *whether* is tolerated in what should be a CWH-only environment.

On the other hand, for the examples (70e) – (70h), which should all be DWH's, because of the irrealis *try*, we again find mostly what we expect, except for (70f), whose *namely* forces a CWH-interpretation, which should be excluded. Again, I have no idea as to what is going on here.

It is as if the irrealis force of *try* is not strong enough to penetrate the complex NP headed by *question*, and we find that even the strong negative trigger *never* is similarly unable to force its *wh*-clause into DWHness:

- (71) Milt never raised the question of who had been hired – [Petrocelli, Bonham, Mastroianni or Zurch / namely, Petrocelli, Bonham, Mastroianni and Zurch].

Summing up, for the case of *question* + *of* + [*wh*-clause], we find that there is no particular direction in which the *of* pushes its *wh*-clause object – by and large, it is the external environment which calls the shots between a CWH and a DWH interpretation.

Now let us turn to *question* + *about*.

- (72) a. Milt succeeded in raising the question about who (?\*the hell) had been hired.  
 b. Milt succeeded in raising the question about who had been hired – namely, Petrocelli, Bonham, Mastroianni and Zurch.  
 c. ?Milt succeeded in raising the question about whether or not the bridge had been built.  
 d. Milt succeeded in raising the question about when the town was going to collect (\*any) taxes.  
 e. Milt tried to raise the question about who (??the hell) had been hired.  
 f. Milt tried to raise the question about who had been hired – [Petrocelli, Bonham, Mastroianni or Zurch / namely, Petrocelli, Bonham, Mastroianni and Zurch].  
 g. Milt tried to raise the question about whether or not the bridge had been built.  
 h. Milt tried to raise the question about when the town was going to collect (?any) taxes.

If we compare (70) and (72), we find some subtle differences in grammaticality, but all of an expected kind, given the previously noted connection between *about* and conjunctiveness. The examples with *whether* are a bit less grammatical when preceded by *about* (compare (70c) and (72c); and (70g) and (72g)). And perhaps the presence of *about* in (72) causes there to be a shade less of acceptability for sentences with *any* – compare (70d) and (72d); and (70h) and (72h). Thus we cannot say that the noun *question* only occurs followed by DWH's, for when *about* is around, CWH's are even preferred.

And now let us pass on to sequences of the noun *question* + [*as to* + [*wh*-clause]].

- (73) a. Milt succeeded in raising the question as to who (the hell) had been hired.  
 b. ?\*Milt succeeded in raising the question as to who had been hired – [Petrocelli, Bonham, Mastroianni or Zurch / ?namely, Petrocelli, Bonham, Mastroianni and Zurch].

- c. Milt succeeded in raising the question as to whether or not the bridge had been built.
- d. Milt succeeded in raising the question as to when the town was going to collect (?\*any) taxes.
- e. Milt tried to raise the question as to who (the hell) had been hired.
- f. Milt tried to raise the question as to who had been hired – [Petrocelli, Bonham, Mastroianni or Zurch / ??namely, Petrocelli, Bonham, Mastroianni and Zurch].
- g. Milt tried to raise the question as to whether or not the bridge had been built.
- h. Milt tried to raise the question as to when the town was going to collect (any) taxes.

We see here that *as to* has the inverse effect from that of *about*: it pushes the following *wh*-clause in the direction of disjunctiveness, although in the case of (73d), not enough for the NPI *any* to become admissible.

Now let us proceed to examine the verb *question*. It shows up in three different syntactic contexts. The first of these, sketched briefly in (74) below, is irrelevant for our discussion, because here, *question* only occurs with *whether*.

- (74)
- a. I question whether we should go forward with this plan.
  - b. \*I question when he got back
  - c. \*They are questioning when the hell we left.
  - d. \*He questioned who shot me when.

This construction represents the only verb I know of in English which can only take a DWH object – and with the only allowable question being a *whether*-question, to boot.

Let us now pass on to the two final cases of *question*, when it occurs as a kind of ditransitive, one case favoring CWH's, and the other DWH's.

- (75) *question* + direct object + [*about* + [*wh*-clause]]
- a. Milt succeeded in questioning them about who (\*the hell) had been hired.
  - b. Milt succeeded in questioning them about who had been hired – namely, Petrocelli, Bonham, Mastroianni and Zurch.
  - c. Milt succeeded in questioning them about whether or not the bridge had been built.
  - d. Milt succeeded in questioning them about when the town was going to collect (\*any) taxes.
  - e. Milt tried to question them about who (?the hell) had been hired.
  - f. Milt tried to question them about who had been hired – [Petrocelli, Bonham, Mastroianni or Zurch / namely, Petrocelli, Bonham, Mastroianni and Zurch].
  - g. Milt tried to question them about whether or not the bridge had been built.
  - h. Milt tried to question them about when the town was going to collect (?any) taxes.

Compare these *about*-linked sentences with the corresponding *as to*-linked ones below.

- (76) *question* + direct object + [*as to* + [*wh*-clause]]
- a. Milt succeeded in questioning them as to who (??the hell) had been hired.
  - b. ? Milt succeeded in questioning them as to who had been hired – namely, Petrocelli, Bonham, Mastroianni and Zurch.
  - c. Milt succeeded in questioning them as to whether or not the bridge had been built.
  - d. Milt succeeded in questioning them as to when the town was going to collect (?\*any) taxes.
  - e. Milt tried to question them as to who (?the hell) had been hired.
  - f. Milt tried to question them as to who had been hired – [Petrocelli, Bonham, Mastroianni or Zurch / ?namely, Petrocelli, Bonham, Mastroianni and Zurch].
  - g. Milt tried to question them as to whether or not the bridge had been built.
  - h. Milt tried to question them as to when the town was going to collect (??any) taxes.

The differences in acceptability, though subtle, are all in the direction that we would expect. And we even note a tiny difference in meaning between these two ditransitive uses of *question*: when in the environment of *as to*, we find a sense involving the requesting of information, whereas in the presence of *about*, what is being asked for is a justification for a decision or for some other kind of action, or for a reason for a state of affairs.

Summing up, then, we can now see that the original overview in (15) of what kinds of questions go with what lexical items was utopianly oversimplified. It suggested that it was possible to divide predicates into three distinct groups: the first group (15A) would only occur with CWH's (this much of (15) seems to still be maintainable), while there was a second group, (15B), which only occurred with DWH's, and a third, (15C), which could go with either type, depending on the external context. After a closer look at the phenomena, it has emerged that it seems to be possible to push all or most of the (15B)-group into manifesting conjunctive behaviors, with the help of negation and *about*.

We might seem, then, to be left with two largish classes: the inflexible emotive factives of (15A), and their more impressionable colleagues in (15C) [including the few in (15B)]. But I am uneasy about making such a claim, for I feel that there is more inflexibility afoot than I have documented. For one thing, I think that almost all of the immense class of manner of speaking verbs, such as those in (77), should also be added to the list of inflexibles, as we can see when we try to force them into disjunctiveness, as in (78).

- (77) *shout, howl, laugh, giggle, shriek, mutter, whisper*, etc. [cf. Levin (1993), p. 204-205 for another 3 or 4 dozen of these]
- (78) a. Tony will (not) shout who (\*the hell) Bob hired – Jan or Mr. Diesock.  
 b. ? They wouldn't whisper where they lived – whether on Oak Street or on Elm.  
 c. Alex never [said / ??muttered] whether or not he was hungry.

In addition, there are a fair number of verbs which involve verbal communication or mental activity which are not seducible into full disjunctivity, although *whether*-clauses seem to occur with (some of) them – cf. the preliminary list in (79) and some indications of their partial disjunctivity in (80):

- (79) *cable, phone*, etc. [Cf. Levin (1993), p. 206 for more of these]; *inform, state, announce, declare, recount, remind, notify, mention, confess, hear, observe, warn, notice, verify*
- (80) a. I never cabled Eddie where (\*on earth) Al left the bagels.  
 b. ? I never cabled Eddie whether or not he should take off the doors.  
 c. I didn't hear where (\*in God's name) you put the dishes.  
 d. I didn't hear whether or not you won.  
 e. I didn't hear where you were sending it – (\*whether) to Rome or (\*whether) to Barcelona.

What is the upshot? I do not have the data to establish this, but my current best guess is that there are (many??) more inflexibles than flexibles. I have not yet succeeded in penetrating the secret of what causes (or prevents) questionable flexibility.

The sentences in (80) are the Tip of the Iceberg which opens the well-known Box: there is a far graver optimism concealed in (16) than that of (15), which merely asserted the existence of three non-overlapping classes. For (16) insinuates that things will work out well, that the five criteria which we have been working with above will obediently draw the same lines across the lexicon and through the syntax. But I fear that such optimism is misplaced; that disjunctiveness is not a discrete predicate, but rather a gradient, or squishy one (cf. fn. 7). I have not tested this idea with any rigor, but my first hunch is that it may be possible to order the five criteria of (16) as in (81):

- (81) A potential hierarchy of disjunctiveness
- irritatives (*the hell*, etc.) → *as to* → negative polarity items → *whether X or (whether) Y* (as in (21b) above) → *whether or not*

The interpretation of the “→” is as follows: any lexical item which accepts some item in this ordering should also accept any item to the left of it. Thus irritatives are the supreme test of disjunctivity – only the crème de la crème of DWH-taking predicates will accept irritatives (I hope).

What can we say about conjunctivity? Must it also be seen as something squishy? At present, I know of only three external conditions which favor a CWH interpretation: *and* (preferably with *namely*), *about*

I will end with a huge loose end. We have seen above how a flexible predicate like *discover* can be swayed CWH-wards by an implicative verb (cf. (82)),

- (82) We succeeded in discovering who logged on, [namely, Norbert and Daggett / \*whether Jeff or Ed].

and can be swayed DWH-wards by either a negative (cf. (83a) or an irrealis (cf. (83b)):

- (83) a. We didn't discover who logged on, [\*namely, Norbert and Daggett / whether Jeff or Ed].  
 b. We wanted to discover who logged on, [\*namely, Norbert and Daggett / whether Jeff or Ed].

The next question becomes: what happens when the environment contains both a negative and an irrealis?

(84) We didn't want to discover who (\*the hell) had logged on.

It appears that, in some cases, at least, there is the same kind of cancellation that we saw above for certain cases of negative polarity (cf. (34)). I currently have no idea at all as to the details of this cancellation algorithm.

Two more observations, to invite future researchers: almost all predicates that accept CWH's also occur with tensed *that*-clauses. I know of only one exception to this redundancy – the verb *study*:

- (85) a. I studied who left when.  
 b. \*I studied that Bill decided to participate.  
 c. ?I studied Bill's deciding to participate.  
 d. I studied Bill's decision(s) to participate.

There seems to be a close link between *wh*-clause-taking predicates (perhaps, only CWH-taking ones, though I suspect that it will prove to be more general) and tensed *that*-clauses. It seems to me that this link should itself be connected to another general redundancy, one associated with the rule I have called Anaphoric Complement Deletion (cf. Ross (1972)), the process that converts (86a) into (86b):

- (86) a. Tony started [playing the piano]<sub>i</sub>, but then he stopped [playing the piano]<sub>i</sub>. →  
 b. Tony started [playing the piano]<sub>i</sub>, but then he stopped  $\emptyset$ <sub>i</sub>.

Though Anaphoric Complement Deletion was originally formulated in such a way as to delete only non-finite complements, I see no reason to continue to impose any tense restrictions on the complements to be deleted. Thus the rule will convert (87a) to (87b), and also (88a) to (88b).

- (87) a. Bill told us [that cheese was fattening]<sub>i</sub>, but I already knew [that cheese was fattening]<sub>i</sub>. →  
 b. Bill told us [that cheese was fattening]<sub>i</sub>, but I already knew  $\emptyset$ <sub>i</sub>.  
 (88) a. Bill told us [who had stolen what]<sub>i</sub>, but I already knew [who had stolen what]<sub>i</sub>. →  
 b. Bill told us [who had stolen what]<sub>i</sub>, but I already knew  $\emptyset$ <sub>i</sub>.

Of interest for *wh*-clausologists is the fact that the two processes exemplified in (87) and (88) seem to have exactly the same exceptions, as far as I can tell. That is, for any predicate which, like the verbs *divulge*, *reveal*, and *report*, which can appear with either *that*-clauses or questions as their objects (cf. (89)),

- (89) a. Marlene [divulged / revealed / reported] that she had seen a UFO.  
 b. Marlene [divulged / revealed / reported] when it landed where.

if the predicate cannot delete its *that*-clause under identity, it will also be unable to delete its embedded *wh*-clause under identity. Thus note the impossibility of following either sentence in (89) with (90):

(90) \* . . . , but no one else [divulged / revealed / reported].

This example is, to the best of my knowledge, typical. That is, to the extent of my admittedly preliminary understanding of this domain, the generalization in (91) holds true.

(91) A predicate which can occur with both *that*-clauses and *wh*-clauses as objects can delete the former type of object under Anaphoric Complement Deletion if and only if it can also delete the latter type of object.

If (91) continues to hold up, as the operation of Anaphoric Complement Deletion is checked for larger sets of predicates, the conclusion I would like to draw is that these two object types must be derived from highly similar sources. After all, consider how similar (92a) and (92b) are semantically:

(92) a. That we hired Jason and that we hired Justin is known.  
b. Who we hired – Jason and Justin – is known.

It seems to me that the only difference between these two sentences is that the latter one carries with it a presupposition of exhaustiveness of knowledge. This type of presupposition is also found in the case of cleft sentences. Thus while a non-cleft sentence can be followed by a clause which negates exhaustiveness, a related cleft sentence cannot be so followed, as we see in (93):

(93) a. We hired Jason (, and we also hired Justin).  
b. It was Jason who we hired (\*, and it was also Justin who we hired).  
c. It was Jason who we hired (? , and we also hired Justin).

In a similar way, while (92a) could be followed by a clause denying exhaustiveness, (92b) sounds funny under these circumstances:

(94) a. That we hired Jason and that we hired Justin is known, but it is not known whether we hired Jared or not.  
b. ? Who we hired – Jason and Justin – is known, but it is not known whether we hired Jared or not.

These waters deepen quickly, and since I at present do not even know how to formulate the schema for the necessary presupposition which differentiates the two sentences of (92), I will leave this discussion completely open.

To sum up: I have argued that there are two types of *wh*-clauses (though the distinction between them seems likely to turn out to be squishy), and have investigated some of the factors that predispose each type to occur in various types of semantactic contexts. Prominent among the factors that push towards disjunctive *wh*-clauses are negation and irrealis, the usual suspects. Prominent among those that push towards conjunctive *wh*-clauses are the preposition *about* and coreference with the pronoun *it*. I have noted correlations that seem to suggest a closer link between embedded *wh*-clauses and *that*-clauses than between *wh*-clauses and any other type of complement.

Not one of these “conclusions” looks like it will survive the night. The mystery as to what predicates can take questions (and of what kinds) has emerged from my musings as undented and unscalable as ever. I urge everybody to band



together to find better ways of talking about all of this. What say?

### Thanks!

I would like to express my profound gratitude to my colleague and friend Yara Goulart for her help in translation and for many helpful comments on the content. Paul Postal has helped me think about these matters for more than three decades now. His work, on islands and on metagraph grammar, has been a constant inspiration, and he has shot down many a rotten argument of mine, for all of which I continue to thank him, as inadequately as usual. Especially I thank him for making me laugh so much through all of this.

My thanks to my colleague and partner Rosália Dutra go far beyond her invaluable help with this paper. They go far beyond the reach of words. I thank my life for her being in it.

### Footnotes

1. (p.4) This “etc.” here should be taken to mean the following: the *surprise* class. That is, the verbs which occur in this selectional frame: S — [+ human] when verbs, and in the frame: S — to [+ human] when *-ing*-adjectives, as in (i) and (ii).

- (i) That Rodney has two hearts surprises me.
- (ii) That he has even one kidney is surprising to me.

These predicates all denote mental states. A partial list of them would include the following:

*amaze, appal, astonish, astound, baffle, bewilder, bore, bother, charm, comfort, depress, discourage, disgust, dishearten, disquiet, distress, enchant, encourage, enlighten, excite, fascinate, frighten, hearten, horrify, infuriate, intrigue, interest, mesmerize, move, mystify, nauseate, overwhelm, perplex, perturb, please, reassure, sadden, shock, stagger, strike, stun, terrify, thrill, wound, worry, etc.* Cf. Levin (1993), pp. 188-193 for discussion of this class.

[Others could be added which evidence slight syntactic or morphological deviances from this basic pattern – for instance, *appeal* occurs with the preposition *to* in both verb and adjective; *impress* forms its adjective in *-ive* instead of in *-ing*, and *help* forms its in *-ful*; *anger, confound, dumbfound*, and *gladden* are missing the expected adjectives, etc.] All of these predicates are what the Kiparskys refer to as “emotive predicates.” (Cf. Kiparsky and Kiparsky (1971))

2. (p.4) This “etc.” is meant as an abbreviation for a large class of predicates which could be called “predicates of knowing” – i.e., their meaning “contains” the meaning of know. Some examples of this class of predicates include:

*ascertain, detect, discover, ferret out, find out, figure out, forget, learn, (mis)understand, remember, teach, verify, etc.*

All of these predicates are non-emotive factives, but it is important to note that there are non-emotive factives which cannot occur with embedded questions. One such subclass is the following small class of concessive verbs:

*admit, acknowledge, concede, grant, etc.*

These are factives, so such sentences as ?*Oswald granted that there are nineteen planets* is odd. However, they do not occur with either type of embedded question: \**Oswald granted where Miriam lives*.

3. (p.4) It is not clear to me who invented this term. I mean it to include all items which only occur in what Klima calls “affective environments,” [i.e., negatives, conditionals, ...] (cf. Klima (1964)), not only idiomatic lexical items, like *budge* or *lift a finger*, but also such grammatical items as *any, ever, at all*, etc., all of which are excluded in (most) positive sentences.

4. (p. 14) I write “DNA” for these adjectives, because no predicate allows Ø-pronoun subjects in English.

5. (p. 18) In these examples and elsewhere, I follow the standard practice with respect to ‘\*’ and parentheses, which is sketched below:

“A (\*B) C” is equivalent to “AC is grammatical, and ABC is ungrammatical.” [i.e., B cannot be added]

“A \*(B) C” is equivalent to “ABC is grammatical, and AC is ungrammatical.” [i.e., B cannot be omitted]

“A (B) C” is equivalent to “both ABC and AC are grammatical.” [i.e., B is optional]

“\*A \*(B) C” is equivalent to “ABC is ungrammatical, and AC is ungrammatical.” [i.e., AC is ungrammatical, with or without B]

6. (p.18) The notion that complement clauses can differ not discretely as to their degrees of nouniness, an idea which I got from class lectures of Zellig Harris at the University of Pennsylvania in 1962, is examined in detail in Ross (1973).

7. (p.20) For some discussion of the notion of squishy categories in syntax, cf. Ross (1973) and the references cited there. For the wider significance of the existence of such categories, cf. the excellent discussion in Lakoff (1987).

### Bibliography

Comrie, Bernard (1976), *Aspect – An Introduction to the Study of Verbal Aspect and Related Problems*, Cambridge University Press, Cambridge, England.

Horn, Laurence (1990), *The Natural History of Negation*, University of Chicago Press, Chicago, Illinois.

Israel, Michael (in press), *The Rhetoric in Grammar: Scalar Reasoning and Polarity Sensitivity*, Cambridge University Press .

Karttunen, Lauri (1971), “Implicative verbs,” *Language*, 47, pp. 340 – 358.

Kiparsky, Paul, and Carol Kiparsky (1971), “Fact,” in Danny D. Steinberg and Leon

- Jacobovits (eds.), *Semantics: an Interdisciplinary Reader in Philosophy, Linguistics, and Psychology*, Cambridge University Press, Cambridge, England, pp. 345 – 369. [A republication of the version in Manfred Bierwisch and Karl-Erich Heidolph (eds.) (1971) *Progress in Linguistics*, Mouton and Company, 's Gravenhage, Holland.]
- Klima, Edward Steven (1964), "Negation in English," in Jerry A. Fodor and Jerrold J. Katz (eds.), *The Structure of Language: Readings in the Philosophy of Language*, Prentice-Hall, Inc., Englewood Cliffs, New Jersey, pp. 246 - 323.
- Lakoff, George (1970), *Irregularity in Syntax*, Holt, Rinehart, and Winston, New York.
- Lakoff, George (1987), *Women, Fire, and Dangerous Things: What Categories Reveal About the Mind*, University of Chicago Press, Chicago, Illinois.
- Levin, Beth (1993), *English Verb Classes and Alternations – A Preliminary Investigation*, University of Chicago Press, Chicago, Illinois.
- Noonan, Michael (1985), "Complementation," in Timothy Shopen (ed.), *Language Typology and Syntactic Description*, Volume II, Chapter 2, pp. 42 -140.
- Ross, Haj (1986b), "Islands and syntactic prototypes," in Anna Bosch, Barbara Need, and Eric Schiller et al. (eds.), *Proceedings of the Twenty -Third Regional Meeting of the Chicago Linguistic Society*, Chicago Linguistic Society, University of Chicago, Chicago, Illinois.
- Ross, John Robert (1969), "Guess who?" in Robert I. Binnick, Alice Davison, Georgia M. Green, Jerry L. Morgan et. al. (eds.), *Proceedings of the Fifth Regional Meeting of the Chicago Linguistic Society*, Chicago Linguistic Society, University of Chicago, Chicago, Illinois, pp. 252-286.
- \_\_\_\_\_ (1972), "Doubl-ing," *Linguistic Inquiry*, 3.1, pp. 61-86.
- \_\_\_\_\_ (1973), "Nouniness," in Osamu Fujimura (ed.), *Three Dimensions of Linguistic Theory*, The TEC Corporation, Tokyo, Japan, pp. 137-257.
- \_\_\_\_\_ (1986a), *Infinite Syntax!*, Ablex Publishing Company, Norwood, New Jersey.