Knowing who:
How perspectives and context interact

Maria Aloni & Bruno Jacinto

1 Introduction

Card scenario In front of John lie two face-down cards. One is the Ace of Hearts, the other is the Ace of Spades, but John doesn't know which is which. He is playing the following game. He has to choose one card: if he chooses the Ace of Spades, he wins 10 euros, if he chooses the Ace of Hearts, he loses 10 euros. Consider now the following sentence:

(1) John knows which card is the winning card.

Is this sentence true in the situation described, or false instead? The natural reaction seems to be 'it depends ...'

Suppose Mary utters (1) in context α as a reply to Sue's question:

(2) Does John even know the rules of the game?

In such context, (1) is, *prima facie*, true. But now suppose that Mary utters (1) in context β as a reply to Sue's question:

(3) Do you think John will win?

In β, contrary to what was the case in α, sentence (2) appears to be false.

Examples like the card scenario can be multiplied, and seem to lead to the conclusion that the truth of sentences where 'knowing which' or 'knowing who' (henceforth 'knowing-wh') constructions occur is context-dependent.[1]

Consider again contexts α and β. It is appealing to adopt the view that one of the roles that these contexts are playing in the determination of the truth of (1) is that of triggering different ways to 'look' at the objects in the domain (*i.e.*

[1] At this stage we wish to point out to the following: even if we assume that the epistemic standards are the same in context α and β, (1) will, *prima facie*, have different truth-values with respect to α and β. Thus, this shift in truth-value from α to β cannot be traced back to the fact that in each context there is a different epistemic standard at play and the meaning and/or the semantic value of 'know' is sensitive to that difference in context. What cases like the card scenario therefore seem to show is a kind of context sensitivity which is characteristic of 'knowing-wh' constructions, in the sense that it cannot be explained by the putative context-sensitivity of 'know'.

the cards). Context α demands that one looks at the cards by 'their suit/figure' (that is, as being, respectively, *the Ace of Spades* and *the Ace of Hearts*), in which case (1) is true, since John knows that the Ace of Spades is the winning card. As to context β, it demands that one looks at the cards by their relative position (that is, as being, respectively, *the card on the left* and *the card on the right*), in which case (1) is false, since it is neither the case that John knows that *the card on the left* is the winning card nor that he knows that *the card on the right* is the winning card.

Let us refer to each of these different ways of looking at the cards (and, in general, to the domain of discourse) through the expression 'conceptual cover'. The difference in truth-value can thus be traced to a difference on the conceptual cover at play in contexts α and β. Consider now sentence

(4) John doesn't know which card is which.

where (4) is uttered by Mary in a context δ as a reply to Sue's utterance

(5) Do you think John will win?

In (4) there seems to be an interplay of contextual covers. That is, what Mary is stating is that John doesn't know that the objects of the domain looked at in a certain way, correspond to the objects in the domain looked at in a different way (since she appears to be stating that John doesn't know that the Ace of Spades is the card on the left, and that the Ace of Hearts is the card on the right).

However, if (4) was uttered in context η, as a reply to Sue's utterance

(6) Do you think John can play this game?

What Mary appears to be stating is that John doesn't know that the ace of Spades is the winning card (nor that the Ace of Hearts is the losing card).

Thus, the truth of (4) also seems to be context-dependent in a way similar to the truth of sentence (1). However, with respect to sentence (4), what appears to be playing a crucial role is not only a specific conceptual cover at play in context, but a *conceptual perspective*[2]; that is, several different ways to look at the domain.

In this article we will investigate how conceptual perspectives and context interact in the determination of the truth of sentences in which 'knowing-wh' constructions occur.

2 A perspective-sensitive semantics for questions

2.1 'Who' and 'knowing who'

We have pointed out to the fact that the context sensitivity of 'knowing-wh' constructions in which we are interested cannot be traced back to the context

[2]The notions of a conceptual cover and conceptual perspective will be defined later on.

sensitivity of 'know'. However, it can, arguably, be traced back to the context sensitivity of 'who' or 'which'. Let us go back to the card scenario. Consider now contexts δ and ϵ. In both these contexts Mary utters the following question:

(7) Which card is the winning card?

In context δ the utterance of (7) is preceded by Mary's utterance of

(8) Sue, I want to know what are the rules of that game that John is playing.

while in ϵ the utterance of (7) is preceded by Mary's utterance of

(9) I wonder whether John will win the game if he chooses the card on the left.

If in context δ Sue answers to Mary by saying that the Ace of Spades is the winning card, Mary will feel completely satisfied with Sue's answers. However, if Sue answers that the winning card is the card on the left, Mary will not take the answers as a satisfactory one, something which she might signal in context by uttering:

(10) Come on Sue, that's not what I'm asking. What I want to know is this: is the winning card the Ace of Spades or the Ace of Hearts?

As to context ϵ, if Sue answers that the Ace of Spades is the winning card, Mary again won't feel satisfied. She might signal this by saying that:

(11) Come on Sue, that's not what I'm asking. What I want to know is this: Is the winning card the card on the left or the card on the right?

Hence, question (7) apparently demands different answers in contexts δ and ϵ. Furthermore, just like happened with respect to (1), this seems to be due to the fact that the question in context δ is made with respect to a conceptual cover different than the one with respect to which the question is made in context ϵ. Thus, the view that the context sensitivity of 'knowing-wh' constructions in which we are concerned is traceable to a context sensitivity of the wh-pronoun is vindicated.

In the rest of this section we will present Aloni's (2001) semantics for wh-clauses. This is a modification of the classical Groenendijk and Stokhofs (1984) analysis, especially geared at capturing the perspective-sensitive nature of questions. The idea is to give the reader a hold of what such a semantics would look like, in order to later on introduce the discussion on the interaction between perspectives and context in our evaluation of 'knowing-wh' constructions.

2.2 Conceptual Covers

Consider again the card situation discussed at the beginning of the article. In front of you lie two face-down cards. One is the Ace of Spades, the other is the Ace of Hearts. You don't know which is which. There are two different

ways of identifying the two cards in this scenario: by their position on the table (the card on the left, the card on the right) and by their suit (the Ace of Spades, the Ace of Hearts). Aloni [2001] proposes to formalize such methods of identification in terms of *conceptual covers*. A conceptual cover is a set of individual concepts which exclusively and exhaustively covers the domain of individuals: each individual is identified by exactly one concept in each world. More formally:

Definition 1 (Conceptual covers)**.** *Given a set of possible worlds W and a domain of individuals D, a* conceptual cover *CC based on (W, D) is a set of functions $W \rightarrow D$ such that:*

$$\forall w \in W : \ \forall d \in D : \ \exists! c \in CC : c(w) = d$$

Illustration To formalize the card situation discussed above we need a model with two worlds, w_1 and w_2, and a domain consisting of two individuals, ♡ and ♠. As illustrated in the diagram below, either ♡ is the card on the left (in w_1) or it is the card on the right (in w_2).

$$\begin{array}{lcll} w_1 & \mapsto & \heartsuit & \spadesuit \\ w_2 & \mapsto & \spadesuit & \heartsuit \end{array}$$

There are only two possible conceptual covers definable over such a model, namely the set A which identifies the cards by their position on the table and the set B which identifies the cards by their suit:

A = {the card on the left, the card on the right}

B = {the Ace of Spades, the Ace of Hearts}

C below is an example of a set of concepts which does *not* constitute a conceptual cover:

C = {the card on the left, the Ace of Hearts}

For C to be a conceptual cover, every individual should be identified by exactly one concept in every world. But this is not the case. In w_1 for example,♡ is identified by two concepts, while ♠ is not identified by any concept at all.

2.3 Question under a perspective

Aloni [2001] considers a language of first order predicate logic enriched with a question operator ?. A special index $n \in N$ is added to the variables in the language. These indices range over conceptual covers. A *model* for this language is a quadruple (W, D, I, C) where W is a set of possible worlds, D is a set of individuals, I is a world dependent interpretation function and C is a set of conceptual covers based on (W, D). A *conceptual perspective* $\wp$ in M is a function from N to C.

Questions are analyzed in terms of their possible exhaustive answers, as in Groenendijk and Stokhof [1984]. The evaluation of a question, however, involves quantification over the elements of a $\wp$-selected conceptual cover rather than over individuals. In the case of multi-constituent questions, different variables can be assigned different conceptualizations. (By $\vec{x}$ we mean the sequence $x_{1_{n_1}}, \ldots, x_{k_{n_k}}$. By $\wp(\vec{n})$ we mean the product $\prod_{i \in k}(\wp(n_i))$. And by $\vec{c}(w)$ we mean the sequence $c_1(w), \ldots, c_k(w)$.)

Definition 2 (Questions under Cover)**.**

$$[\![?\vec{x}\phi]\!]^{\wp}_{M,w,g} = \{v \in W \mid \forall \vec{c} \in \wp(\vec{n}) : [\![\phi]\!]^{\wp}_{M,w,g[\vec{x}/\vec{c}(w)]} = [\![\phi]\!]^{\wp}_{M,v,g[\vec{x}/\vec{c}(v)]}\}$$

To express knowledge-wh, the language is extended with a knowledge operator K_a selecting questions as complements. A sentence like "a knows whether ϕ" is translated as $K_a(?\vec{x}\phi)$. A model for the extended language is a quintuple (W, D, F, I, C), where W, D, I and C are as above and F is a function mapping individual-world pairs (a, w) into subsets of W. Intuitively, $F(a, w)$ represents the epistemic state of a in w. The semantics of the knowledge operator K_a is defined as follows:

Definition 3 (Knowledge-wh)**.**

$$[\![K_a(?\vec{x}\phi)]\!]^{\wp}_{M,w,g} = 1 \textit{ iff } F(a, w) \subseteq [\![?\vec{x}\phi]\!]^{\wp}_{M,w,g}$$

$K_a(?\vec{x}\phi)$ is true in w wrt $\wp$ iff a's epistemic state is contained in the denotation of $?\vec{x}\phi$ under $\wp$ in w. Since denotation of a question in a world corresponds to the question's true exhaustive answer in that world, K_aQ is true in w iff a's epistemic state entails the true exhaustive answer to Q in w.

Illustration Consider again the card situation described above. Furthermore, assume that one of the cards is the winning card, but you don't know which one. We can model this situation as follows (the dot indicates the winning card):

$w_1 \mapsto \heartsuit \quad \spadesuit^{\bullet}$
$w_2 \mapsto \spadesuit \quad \heartsuit^{\bullet}$
$w_3 \mapsto \heartsuit^{\bullet} \quad \spadesuit$
$w_4 \mapsto \spadesuit^{\bullet} \quad \heartsuit$

Consider the following interrogative sentence:

(12) a. Which card is the winning card?
b. $?x_n.\ x_n = \iota y_n P y_n$

The evaluation of this sentence depends on the perspective that is taken. There are two possible perspectives. Under one ($\wp$), the cards are identified by their position, while under the other ($\wp'$), the cards are identified by their suit:

(13) a. $\wp(n) = \{$the card on the left, the card on the right$\}$;

b. $\wp'(n) = \{$the Ace of Spades, the Ace of Hearts$\}$.

The question in (12) partitions the set of worlds in two different ways depending on which perspective is assumed:

under $\wp$: $\begin{array}{|c|}\hline w_1 \\ w_2 \\ \hline w_3 \\ w_4 \\ \hline \end{array}$ under $\wp'$: $\begin{array}{|c|}\hline w_1 \\ w_4 \\ \hline w_2 \\ w_3 \\ \hline \end{array}$

Under $\wp$, (12) disconnects those worlds in which the winning card occupies a different position. Under $\wp'$, it groups together those possibilities in which the winning card is of the same suit. In other words, in the first case, the relevant distinction is whether the left card or the right card is the winning card; in the second case the question expressed is whether Spades is the winning card, or Hearts. Since different partitions are determined under different perspectives, we can account for the fact that different answers are required in different circumstances. For instance, (14) counts as an answer to (12) only under $\wp'$:

(14) The Ace of Spades is the winning card.

Suppose now you know that the Ace of Spades is the winning card, but Ann doesn't know whether it is the card on the left or the one on the right. In this situation Ann's epistemic state corresponds to the set: $\{w_1, w_4\}$. Sentence (15) is then correctly predicted to be true under $\wp'$, but false under $\wp$.

(15) a. Ann knows which card is the winning card.
b. $K_a(?x_n.\ x_n = \iota y_n P y_n)$

At last consider the following examples of a multi-constituent question:

(16) a. Which card is which?
b. $?x_n y_m.\ x_n = y_m$

(17) a. Ann does not know which card is which.
b. $\neg K_a ?x_n y_m.\ x_n = y_m$

As it is easy to see, in Groenendijk and Stokhof's theory, (16) and (17) are wrongly predicted to be vacuous and to entail that Ann's epistemic state is inconsistent, respectively. On this account, instead, since different wh-phrases in a multi-constituent question can range over different sets of concepts, (17) and (16) receive a correct interpretation. To see this, assume $\wp$ assigns different covers to n and m, for example:

(18) a. $\wp(n) = \{$the card on the left, the card on the right$\}$;
b. $\wp(m) = \{$the Ace of Spades, the Ace of Hearts$\}$.

If interpreted under such perspective, (16) groups together those worlds that supply the same mapping from one cover to the other, and is not vacuous in our model. The determined partition is depicted in the following diagram:

under $\wp$:

w_1
w_3
w_2
w_4

The question divides the set of worlds in two blocks: $\{w_1, w_3\}$ and $\{w_2, w_4\}$. The first alternative corresponds to the possible answer (19), the second to the possible answer (20):

(19) The Ace of Hearts is the card on the left and the Ace of Spades is the card on the right.

(20) The Ace of Hearts is the card on the right and the Ace of Spades is the card on the left.

If Ann's epistemic state is specified as above, i.e. as $\{w_1, w_4\}$, then (17) would be true in w_1 without entailing inconsistency.

Aloni [2001] takes the meaning of a wh-clause and therefore of a 'knowledge-wh' ascription to be sensitive to a contextually determined conceptual perspective. There are various positions one can adopt on the notion of a context and its role in interpretation, though. The next section reviews these positions and formulates the different analyses for 'knowledge-wh' ascriptions they would determine, if adopted.

3 Three positions on the role of contexts

Contexts of use are typically understood as playing two roles in the determination of the truth of a sentence Kaplan [1989a,b]:

1. They help determine the proposition expressed by a sentence;
2. They help determine the circumstance of evaluation of the proposition expressed by a sentence (and thus its truth or falsity at that context).

That is, the typical understanding of the two roles of the context of use is that a sentence X is true at a context of use α if and only if the proposition expressed by X at α is true at the circumstance of evaluation determined by α.

In order to illustrate the first kind of role, consider the following sentence:

(21) I am American.

Suppose (21) is uttered in context α by Barack Obama. In such case, the proposition expressed by (21) in α is the same proposition as the one expressed by (22) in every context:

(22) Barack Obama is American.

However, if (21) is uttered in context β by George W. Bush, the proposition it expresses is the same as the proposition that (23) expresses in every context:

(23) George W. Bush is American.

Sentence (21) expresses different propositions in the different contexts α and β. Due to this fact, even though the extension of the predicate 'is American' might be the same in both α and β, the sentence can be true with respect to α (β) but false with respect to β (α), for the proposition expressed at α (β) might be true at α (β) while the proposition expressed at β (α) might be false at β (α).

This shows that the proposition expressed by (21) will vary with the context in which the sentence is used. Furthermore, the sensitivity to the context of use displayed by (21) can be traced back to the sensitivity to context displayed by 'I'. This expression, in Kaplan's words, has a content which varies from context to context, in each context its content being a constant function from possible worlds to the speaker of the context.

A paradigmatic case of the second kind of context dependence is contingency. Sentence (24) is true, but could have been false,

(24) Kaplan is a philosopher.

That (24) is actually true is due to the fact that the context of use determines that the world of the circumstance of evaluation of the sentence is the actual world. Had the context of use of the sentence been in a possible world where Kaplan was a blacksmith, and the sentence would have been false.

If one assumes that circumstances of evaluation also possess a time parameter, then this parameter will also be determined by the context of use, as can be seen by considering the following sentence:

(25) Barack Obama is the president of the United States.

Even if John's use of the sentence in 2010 is assessed for truth by Sue in 2030, the sentence as used by John is 2010 will still be true. The context sensitivity of (25) can be traced back to the context sensitivity of the expression 'is the president of the United States'. This expression will have different extensions in different times. By determining the time parameter of the circumstance of evaluation the context of use determines the extension of the expression that will be relevant for the determination of the truth of the sentence.

Recently, MacFarlane argued that it is not only the context of use that plays a role in determining the circumstance of evaluation of a sentence. Also the *context of assessment*, i.e. the context in which one is assessing a particular use of a sentence for truth or falsity, plays a similar role [e.g. MacFarlane, 2005, forthcoming]. His position is that a sentence X is true at contexts of use U and assessment A if and only if the proposition expressed by X at U is true at the

circumstance of evaluation determined by both U and A.[3]

MacFarlane argues that one kind of sentences with respect to which one can see that the context of assessment plays such a role are sentences in which 'know' occurs. The claim is that circumstances of evaluation contain an epistemic standard parameter, and that the context of assessment determines the value of this parameter. He sees this option as a natural way to account for the following data concerning knowledge ascriptions:

1. Our use of 'know' seems to indicate a variability on the standards according to which someone is taken as knowing something: several times we assert that we know something, but after asserting it we are drawn to assert not to know that same something, when we have learned nothing new nor are correcting a mistake. For instance, John might assert 'I know that Bill is at home', but after Mary mentions the possibility that there might be long queues in the highway, John will afterwards assert 'I don't know that Bill is at home'. One way to explain these phenomena is by saying that after Mary mentions the possibility that there might be long queues in the highway the standards according to which John counts as knowing that Bill is at home have changed.

2. The same epistemic standard appears to be in place when 'know' occurs embedded in temporal or modal operators, even though these operators shift the circumstances of evaluation of sentences.

3. After standards have been raised, retraction will take place.

   For instance, John will say that his previous assertion that he knew that Bill was at home is false.

Suppose John utters (26) in context α:

(26) I know that Susan's computer is in her bedroom.

Assuming John was being cooperative, the sentence, at the context α of its utterance is, *prima facie*, true. Mary replies to John in the following way:

(27) How do you know that her brother didn't took it to the living room?

Mary's reply forces John to retract, saying:

(28) You're right, what I said before was false. I don't know that Susan's computer is in her bedroom.

[3]MacFarlane rejects the hypothesis that the context of assessment of a sentence plays a role similar to the first role played by the context of use. That is, he rejects that there is a context of assessment A of the use of a sentence X in context U such that A is different from U and A helps determine the proposition expressed by X as used in U. One can obviously stipulate that a formal language function in such way. The hypothesis that MacFarlane rejects is that contexts of assessment play such role with respect to natural language sentences/subsentential expressions.

What is argued by MacFarlane is that the sentence uttered by John in α is true with respect to α taken also as the context of assessment, but that it is false taken with respect to the context of assessment resulting from Mary's utterance, since her utterance had the effect of raising the epistemic standards.

This shows how relativity of truth to the context of assessment can explain the first and third points mentioned above. It can also explain the behavior of 'know' when embedded under modal or temporal operators. The effect of these operators is to shift the world and time parameters of the circumstance of evaluation. For instance, the sentence

(29) Necessarily John knows that Susan's computer is in her bedroom.

is true in contexts of use α and assessment β if and only if the sentence 'John knows that Susan's computer is in her bedroom' is true in all the circumstances of evaluation that are just like the one determined by α and β, except perhaps for the world parameter. One can thus see that this operator does not affect the epistemic standard parameter. The same will be the case with respect to temporal operators: they will affect only the time parameter of the circumstance of evaluation. Hence, by assuming that truth is relative both to contexts of use and of assessment, one can explain the three facts about knowledge ascriptions.

As before, the context sensitivity of sentences such as (26) can, in part, be traced back to the context sensitivity of 'know'. Even if world and time parameters are fixed, this expression will have different extensions depending on the value of the epistemic standard parameter at play. And, as we saw is argued by MacFarlane, this parameter is determined by the context of assessment.

Three notions were introduced in the previous paragraphs: the traditional distinction between context of use and circumstances of evaluation (Kaplan 1989), and MacFarlane's context of assessment. Adopting a taxonomy from 2005 we will distinguish three positions with respect to the context sensitivity of 'knowledge-wh' ascriptions. Taking for granted that wh-clauses are interpreted relative to a conceptual perspective:

1. **Contextualism** takes the relevant perspective to be that at play at the context of use;

2. **Sensitive Invariantism** takes the relevant perspective to be that at play at the circumstances of evaluation;

3. **Relativism** takes the relevant perspective to be that determined by the context of assessment.[4]

[4]More precisely: **Contextualism** takes the proposition expressed at a context of use by a sentence containing a wh-clause to be dependent on the perspective that is at play at that context; **Sensitive Invariantism** takes the truth, at a context of use (and of assessment), of sentences containing wh-clauses to be dependent on the perspective at play at the circumstances of evaluation of the sentence (where circumstances of evaluation do not include any perspective parameter, just like sentences such as 'Jupiter is as far apart to Nepture as the Earth is from the Sun' depend for their truth at a given circumstance of evaluation on the dis-

Aloni [2001], presented in the previous section, is an example of a contextualist analysis. As far as we know, nobody has explicitly defended a sensitive invariantist or a relativist analysis of knowledge-wh in the literature.

To see the difference between these positions we need to vary one dimension while keeping the others constant. In what follows, we will consider two examples. In the first example, the circumstances of evaluation are kept fixed while varying, separately, the context of use and the context of assessment. In the second example, the circumstances of evaluation will be shifted while keeping the contexts of use and assessment fixed.

The bombing Our story begins on Wednesday at a cocktail party. Sue tells Mary that she needs to meet a certain Jack Compton. Mary, who knows that her husband Albert has just been introduced to Jack Compton by a friend, utters (30):

(30) Albert knows who Jack Compton is.

One day later a police investigation is taking place. The police is looking for the helper of Jack Compton, who has put a bomb on the United States's embassy in Bolivia. Mary is being interrogated by the police on Thursday, and the police is interested in finding out whether Albert knew on Wednesday that Jack Compton was the man behind the bombing of the embassy. Assume that Albert's friend who introduced him to Jack Compton at the party, told him nothing concerning the connection of Jack Compton to the bombing (and thus Albert remained ignorant of such fact). Consider now Mary's utterance of (31), when being interrogated by the police.

(31) Albert didn't know on Wednesday who Jack Compton was.

In their respective contexts, (30) and (31) are both true. Such data seems to provide a strong argument against sensitive invariantism. If sensitive invariantism was right, the relevant perspective for (30) and (31) would be the one at play at the circumstances of evaluation, i.e. at the party on Wednesday. The perspective at play there was one that assigns identification by ostension. If interpreted with respect to ostension, (31) would be false, contrary to intuition. This suggests that the relevant perspective for the interpretation of knowing-wh constructions does not vary with the circumstances of evaluation.

Intuitively, sentence (31) uttered by Mary at the police station is true. But was Mary's earlier assertion of (30) at the party, if assessed later, false? If Mary were to assess her earlier claim now, would she retract it? We believe she wouldn't. If challenged, Mary could say: 'When I said 'Albert knows who Jack Compton is' on Wednesday I asserted something true, because Albert, who had

tance between the Earth and the Sun at that circumstance, even though the circumstance has no 'distance between the Earth and the Sun' parameter); and **Relativism** takes the truth, at a context of use and of assessment, of sentences containing wh-clauses to be dependent on a perspective parameter in the circumstances of evaluation, whose value is given by the perspective at play at the context of assessment.

just been introduced to the man, would have been able to point him out for Sue, who wanted to meet him. When I said today, at the police department, 'Albert didn't know on Wednesday who Jack Compton was', again, I asserted something true, because Albert on Wednesday didn't know that Jack Compton was the man responsible for the bombing of the U.S. embassy in Bolivia.' So, as it seems, shifting the context of assessment does not change our evaluation of earlier utterances. We have considered three cases (let c stand for the context of use, e for the circumstances of evaluation, and a for the context of assessment):

1. Sentence (30) used and assessed by Mary on Wednesday at the party
   $\mapsto c, e, a = \text{wed}$
2. Sentence (30), its context of use and assessment being on Thursday at the police station, and its circumstance of evaluation being on Wednesday
   $\mapsto e = \text{wed}; c, a = \text{thu}$
3. Sentence (30) used by Mary on Wednesday but assessed on Thursday, with the circumstances of evaluation having its parameters determined by the context of use, and of assessment
   $\mapsto c, e = \text{wed}; a = \text{thu}$

In case 1, e, c and a are all the same, and our knowledge ascription is true. In case 2, we have shifted both the context of use and the context of assessment, with dramatic consequences to our valuation of the knowledge ascription, its negation now is judged as true. This, we argued, shows that the relevant perspective is not the one at play at the circumstance of evaluation. In case 3 we shifted the context of assessment with respect to case 1[5] without consequences for our valuation of the earlier claim. This, we would like to argue, shows that it was the shift in the context of use that had an impact on our valuation in case 2, and not the shift in the context of assessment. Therefore, it seems that knowing-wh constructions are sensitive to the perspective at play at the context of use, as contextualism holds, and not to the perspective at play at the context of assessment or at the circumstance of evaluation.

In the bombing example we have varied the contexts of use and of assessment while keeping the circumstances of evaluation fixed. What happens if we vary the circumstances of evaluation while keeping the contexts fixed? Consider the following situation.

The exam On Monday, during an exam on European politics, John correctly answered to the question 'Who is the president of Italy?'. Some days later, during a party with many European politicians, Mary wants to meet the president of Italy, and asks John whether he knows who he is. John, who has no idea what the president of Italy looks like, utters (32).

[5] And, accordingly, added a perspective parameter to the circumstances of evaluation, whose value is given by the perspective at play at the context of assessment.

(32) I don't know who the president of Italy is, but on Monday I knew who the president of Italy was.

John's utterance is odd (unless one considers the possibility that the between Monday and the day of the party there were presidential elections in Italy) but acceptable, if you know all the relevant facts. The relevant methods of identification here seem to vary with the circumstances of evaluation. On Monday, at the exam, identification by name was the most prominent method of identification, and since John knew the name of the president, he knew who the president of Italy was. At the context of use, at the party, identification by ostension is at play, and since John doesn't know what the president looks like, he doesn't know who the president is. Sensitive invariantism seems to get it right here. Does contextualism get it wrong? No, contextualism has a ready explanation of this case in the following terms. Our sentence contains two wh-pronouns. For each of them context has to determine the conceptual cover that constitutes its domain of quantification. Typically, cover indices are resolved to the most salient cover (in this case identification by ostension). But deviation is possible. John wants to appeal to both conceptual covers in the same context, for that's the way he has to convey what he wishes to convey. And thus, the two pronouns will have different conceptual covers as their domain of quantification (the first corresponding to identification by ostension, the second by name). This will strike Mary as odd, for she was considering that the context set was one in which the perspective at play had as its only conceptual cover the one in which objects are identified by ostension. Nonetheless, if Mary assumes that John wants to conform to the rule according to which a proposition asserted is always true in some but not all of the possible worlds in the context set (a rule that, by default, speakers are assumed to be conforming to), she will have to conclude that John's context set is different than what she took it to be, or otherwise he would be saying uttering a contradiction, thus violating the rule. This might lead her to immediately conclude that the perspective at play is one also containing the conceptual cover corresponding to identification by name, or this might lead her to ask for further clarification from John, since she is not being able to get at what is John's context set. In any case, contextualism can explain away this and similar cases. Contextualism seems to be in the right footing.

To conclude, adopting a taxonomy from MacFarlane, we have distinguished between a contextualist, and a sensitive invariantist and a relativist position with respect to the role of conceptual perspectives in the interpretation of knowing-wh constructions. There is still one other position to consider:

4. **Strict Invariantism** takes the truth of sentences containing wh-clauses to be, in general, independent of the conceptual cover at play at a given context.

Contextualism and Strict Invariantism will be compared in the following section.

4 Contextualism vs strict invariantism

A strict invariantist has at least two different options with respect to providing an account of the semantic content of 'knowing-wh' constructions. According to one of them, the denotation of the embedded wh-clause is always made with respect to one and the same conceptual perspective. This position gets it wrong. Consider again the card scenario presented at the beginning of the paper. None of the two conceptual perspectives seem to have primacy with respect to the other. It seems that examples such as that one, where there's no reason to consider one conceptual perspective as being privileged, can be multiplied. Hence, if strict invariantism gets it right, it cannot be through the adoption of this first option.

The other option available for the strict invariantist leads to a different semantic analysis of 'know'. The idea is that an agent a knows Q if and only if *there is* a conceptual perspective $\wp$ such that a's epistemic state is contained in the denotation of Q under $\wp$.

The second option seems to be more promising, and related views have already been proposed in the literature. One such view is the one argued for by Braun [2006]. Three general arguments for strict invariantism and against contextualism can be extracted from that text.

4.1 Arguments in favor of strict invariantism

The first of these arguments is a direct argument for strict invariantism, and consists in claiming that, given a natural analysis of 'knowing wh' construction, the strict invariantist position is the one that fits naturally into it (and the contextualist position doesn't).

Braun proposes the following analysis for 'knowing wh' constructions:

Knowing Q If Q is the content of a question, then X knows Q if and only if X knows a proposition that answers Q.

IP Analysis A proposition answers a question if and only if it provides information about the question's subject matter

where the question's subject matter is taken by Braun to be its queried relation (furthermore, on his analysis, it seems that a proposition that 'is about' the queried relation can fail to provide information about that relation only if it is logically true).

One can now see that the strict invariantist position does seem to fit the analysis provided by Braun (and that, *prima facie*, the contextualist analysis doesn't). For if there is a conceptual perspective such that X knows the answer to the question determined by that conceptual perspective, then, arguably, X knows a proposition that provides information about the question's subject matter. Thus, *prima facie*, if the analysis is right, then the contextualist position is wrong.

However, if more attention is payed to the analysis provided, it can be concluded that it doesn't involve, at all, discarding the contextualist position. For, according to a contextualist, a proposition also answers a question if and only if it provides information about the question's subject matter. The difference between a contextualist and a strict invariantist is that the question's subject matter varies with context. Thus, a contextualist can also embrace the analysis of 'knowing Q' provided. The contextualist's point is that, given the semantic analysis of questions endorsed by him, the class of propositions that constitute an answer to the content of a question is more restricted than it is for a strict invariantist. Therefore, the direct argument for strict invariantism doesn't seem to be enough to vindicate it, for contextualism, a distinct position, is not inconsistent with the analysis of 'knowing Q' provided.

The second and third arguments are indirect, in the sense that they consist in arguments against the contextualist position.

The second argument is as follows: 1) Assume, for *reductio*, that the contextualist thesis is true. Consider a sentence of the form 'X knows who φ' uttered by Y in context α. Since contextualism is correct, it follows that 2) the proposition expressed by that sentence is dependent on the conceptual perspective at play in context α. But then, a sentence of the form 'Y said that X knows who φ' uttered by Z at a context β might be false, even if no context-sensitive expressions occur in φ, since the conceptual perspective at play in context β might be different than the conceptual perspective at play in α, and thus the proposition expressed by 'X knows who φ' when occurring embedded in the latter sentence might be different from the proposition expressed by that same sentence in context α, which would make the sentence 'Y said that X knows who φ' false at β. But, 3) when no context-sensitive expressions occur in φ, 'Y said that X knows who φ' never fails to be true at any context β, provided that in α Y in fact uttered the sentence 'X knows who φ. Contradiction. Thus, 4) contextualism is false. *A fortiori*, strict invariantism is the correct position with respect to the way conceptual perspectives are relevant for the determination of the truth of the sentences (it is easy to see that strict invariantism does not fall prey to the same objection, for it predicts no shift on the proposition expressed by 'X knows who φ' in one or another context).

Let us illustrate what the argument boils down to. Consider the following sentences:

(33) I am the president of the United States

uttered by Barack Obama in 2010, and

(34) Barack Obama said that I am the president of the United States

uttered by Vladimir Putin in 2010. Sentence (33) is true, while sentence (34) is false (even though the embedded sentence in (34) echoes the true sentence (34)). This phenomenon is due to the context sensitivity of 'I'. This expression always picks out the speaker of the context. For this reason, the meaning of the

embedded 'I am the president of the United States' in (34) is the same as that of sentence (35)

(35) Barack Obama said that Vladimir Putin is the president of the United States,

and thus not the same as the meaning of (36)

(36) Barack Obama is the president of the United States

which is the meaning of (33). Hence, it is not true that what Barack Obama said is that which Vladimir Putin reports, for the embedded sentence expresses a different proposition than the one that it echoes. The contextualist argues that, just like 'I', 'knows who' is context-sensitive. Consider now the following sentence:

(37) John knows who the president of Namibia is,

uttered by Ann to Agnes, John's teacher, in a context where John is examined by Agnes with respect to the names of the presidents of different countries; suppose that Julie was also present during the conversation, and furthermore that some time afterwards she will be working for the U.N. in a general meeting of the organization. While working there, Julie and other colleagues are trying to track down where some of the presidents of the different countries are sitting exactly. In such context, Julie utters

(38) Ann said that John knows who the president of Namibia is

By uttering (38) Julie is not being cooperative, one would probably say. Nevertheless, Ann doesn't seem to be uttering anything false. If she was uttering something false, then sentence

(39) Ann did not say that John knows who the president of Namibia is

would be true. Suppose Jack, one of the colleagues of Julie was also present at the moment of Ann's utterance. Jack would reject Julie's utterance of (39). And, it seems, rightly so, because in such case Julie would be uttering something false. However, contextualism predicts that (38) is false and (39) is true, for, a contextualist would say, the sentence uttered by Ann did not express the proposition expressed by the embedded sentence 'John knows who the president of Namibia is' as it occurs in (39), and thus contextualism must be rejected.

This last argument can, however, also be rejected. The crucial premise is premise 2). Its strength comes from taking the context-sensitivity of 'knows who' has being of precisely the same type as the context of sensitivity of expressions like indexicals (expressions like 'I', 'here', 'now'). These expressions are sensitive solely to the context of utterance. However, as Partee [1989] has identified, some expressions are sensitive to other contexts: the context of discourse and the internal linguistic context. A known example of an expression that exhibits

the three kinds of context-sensitivity is 'local'. Consider the three following sentences:

(40) A local bar is having an 'happy hour' at 19:00.

(41) Agnes was going for a stride in Buenos Aires when she noticed that a local bar was having an 'happy hour' and stopped for a drink.

(42) Every football fan is watching the World Cup match in a local bar.

In sentence (40) 'local' is sensitive to the context of utterance; in (41) the expression is sensitive to the context of discourse, and thus the bar mentioned is local with respect to the city introduced previously in the discourse; and in (42) 'local' is sensitive to the internal linguistic context, and thus each bar is local to the location of each of the football fans. Thus, premise 2) can be rejected. What the argument shows, a contextualist would argue, is not that contextualism is wrong, but that 'knows who' is sensitive not only to the context of utterance, but also to the context of discourse. This is the reason why sentence (37) can be *echoed* (disquoted) in sentence (38) without this last sentence turning out to be false, for the expression 'said that' introduces as the context of discourse the one where the embedded sentence was said. One can realize that this is so by considering the following sentences:

(43) I am at a local bar

uttered by John in a telephone call to Ann, and

(44) John said that he is at a local bar

uttered by Mary just after talking with John on the telephone. Even though 'local' in (43) refers to the location of the context of utterance, in (44) 'local' refers to the location of the context of discourse introduced by 'John said that', the location of the context of John's utterance, not to the location of Mary's utterance. Therefore, the second of the strict invariantist's arguments can be dismissed by the contextualist.[6]

The last argument consists in a dilemma to the contextualist. What is claimed is that a contextualist either: i) is committed to an unintuitive relation between knowing who φ and knowing an answer to the content of 'who φ', it being possible for X to know a proposition that stands in the answering relation to the content of 'who φ' without X knowing who φ; or ii) is committed to the context-sensitivity of 'answer'.

The argument runs as follows: if 'knowing who' is context-sensitive, then it is possible to know an answer to a question of the form 'who φ', without knowing who φ (due precisely to the context sensitivity of 'knowing who'). But this, it

[6]Braun has also recognized that this argument could lose some of its strength due to the fact that comparative and gradable adjectives would be subject to the same objection as the one he provides, even though these expressions are largely recognized as being context-sensitive.

is claimed, is absurd.[7] Thus, it is argued, in order to avoid such consequence, the only alternative available to the contextualist is to regard the answering relation as being itself context-sensitive, the idea being that X knows who φ in a context C if and only if X knows a proposition that stands in the relation that 'answer' expresses in C to the question 'who φ'.

Adopting this solution, one can avoid the absurd conclusion that it is possible to know an answer to a question of the form 'who φ', without knowing who φ.

But, Braun argues, the context-sensitivity of 'answer' is equally absurd. Assume otherwise. In such case, reports taking place at a context D stating that X answered Y's question can be false, even though in the context $C \neq D$ where Y posed the question, X answered it.

However, this objection misses its target, for the contextualist isn't committed to it being possible to know an answer to a question expressed by 'who φ' without knowing who φ, even assuming that the answering relation is not context-sensitive. A contextualist can connect the context-sensitivity of 'knowing who φ' to that of the embedded question 'who φ'. Once this position is adopted, he is no longer committed to it being possible to know an answer to a question expressed by 'who φ' without knowing who φ, for what proposition constitutes an answer to 'who φ' will vary with context. Furthermore, it will not vary because 'answer' is context-sensitive, but because 'who φ' is context-sensitive.

Braun states that similar problems arise if context-sensitivity is attributed to other expressions, such as wh-questions. It is not clear to us how Braun would adapt his argument. A plausible way would be as follows: a report taking place at a context D stating that X asked Y can be false, even though in context $C \neq D$, X asked Y. Since this is absurd, for X asked Y, contextualism is wrong.

An example. Suppose that, in context α, John asks the following question:

(45) Who is the president of the United States?

having in mind a method of identification according to which objects are identified by name.

In context β, a day after α, while discussing where in the U.N. meeting room are the presidents of the different countries seated, Mary reports the following:

(46) John asked yesterday who is the president of the United States.

The idea is that, according to contextualism, sentence (46) is false, for the question that John asked is not the one that Mary is reporting him as having asked, for the perspectives at play at the two contexts are different. But this, it is claimed, is absurd.

[7] It is actually possible to know an answer to a question of the form 'who φ', without knowing who φ. For example, 'Mary called' is an answer to the question 'who called?'. But knowing that Mary called is not enough to know who called. Suppose Mary and John called, but you believe that only Mary called. Than you know that Mary called, but you don't know who called. But we will disregard these issues here [see Groenendijk and Stokhof, 1984].

It seems to us that here it is also being assumed that the context-sensitivity exhibited by wh-questions is of the same type as the context-sensitivity exhibited by indexical expressions. But, as we saw earlier, the contextualist can reject such assumption.

Suppose that Mary and Agnes are going for a stride in Buenos Aires on Wednesday. Mary asks to a man on the street:

(47) Does the local bar have good music?

Mary and Agnes are flying back to Amsterdam that same day. One day after, talking about their trip, Agnes says:

(48) (...) and then Mary asked whether the local bar had good music.

Clearly, 'local' here refers to the location of the context of discourse introduced by 'Mary asked', the location of the context of Mary's question, not the location of Agnes utterance.

In the same way, the perspective relevant for interpreting (46) is the one of the context of discourse introduced by 'John asked yesterday', that is, the one that was at play at the time of John's utterance, not the one at play at the time of Mary's report. Hence, the argument does not force us to accept the desired conclusion.

As we have just seen, strict invariantists are unable to provide decisive arguments in favor of their position. Furthermore, they are incapable of dealing not only with the case described by the card scenario, but also with the several similar context-shifting arguments that can be produced. The upper hand on the strict invariantism vs. contextualism debate thus seems to lie on the contextualist side. However, there are cases that contextualists cannot account for with the same success.

For instance, suppose Julie is going out today and has just received a phone call. Her father wishes to know with whom she is going, asking:

(49) Who are you going out with?

To this, Julie's reply is

(50) With the person who as just called me.

Julie is certainly not being cooperative. But, as Braun notes, the reason why such 'smart aleck' replies are annoying seems to be that it is 'incorrect to accuse the respondent of failing to answer the question'. If this is so, then the contextualist must be getting something wrong. For clearly, the conceptual perspective at play in the context where the question is being asked is not one determining a conceptual cover containing the individual concept *the person who called Julie*. Thus, there seem to be cases pulling for either direction. On the one hand, cases like the card scenario seem to provide a reason to adopt the contextualist position, and cases like the above seem to provide reason to adopt the strict

invariantist position.

4.2 Existential closure or not

The version of contextualism we have considered so far, based on Aloni [2001], proposes the following representation for knowing-wh constructions containing a free variable n that has to be supplied a value by the context of use.

(51) $K_a(?x_n\phi)$ [contextualist – free variable view]

A plausible competitor to the contextualist account of knowing-wh constructions involves the use of a mechanism of existential closure which operates freely on the grammatically determined logical form of the utterance.

(52) $\exists n.K_a(?x_n\phi)$ [strict invariantist – $\exists$-closure view]

In the previous section we have dismissed a number of arguments presented by Braun against a contextualist approach and in favor of strict invariantist view, but cases pulling for either positions could be made. In this section we will summarize the empirical and conceptual challenges these two approaches encounter and at the end argue in favor a mixed analysis, a contextualist $\exists$-closure view which solves these challenges using tools that have been proposed in a parallel debate between contextualist [e.g. Kratzer, 1998] and existential closure [e.g. Reinhart, 1997, Winter, 1997] accounts of exceptional scope indefinites.

Arguments against $\exists$-closure view The first problem for the existential closure view (already noted by Braun) is that if we don't somehow restrict the domain of quantification of the existential quantifier we always get a trivial meaning.

For instance, one knows who Barack Obama is by knowing that he is the man who is called 'Barack Obama', and one knows who the president of the United States is by knowing that he is the president of the United States. In general, there will always be a perspective such that what one knows by knowing who φ is a proposition which is true in every world.

To solve this problem, Braun assumes that the existential quantification involved in the analysis of 'knowing who' should be restricted in order to avoid trivial meanings. This, however, is a stipulation (unless we assume that domain restriction is a contextual process, in which case the required restriction would follow from general principles ruling contextual saturation; but in this case the $\exists$-closure view would no longer be a representative of strict invariantism).

A second challenge for this view concerns examples like the following used in the card situation:

(53) a. If Ann knows which card is the winning card, then she will win 10 euro.
b. $\exists n.K_a(?x_n\phi) \rightarrow \phi$

It is clear here that the intended meaning is one assuming a specific method of identification, namely identification by position, and not an existentially quantified meaning (even assuming Braun's restriction to a non-trivial resolution). The meaning predicted for 'knowing-wh' constructions by the $\exists$-closure view is not specific enough in this case.

Arguments against free variable view The first challenge for the free variable view is of a conceptual nature, and concerns contextualism in general. On the contextualist account what the speaker says involves a determinate way of picking out a method of identification. But the audience is not privy to the way of picking out the relevant cover which the speaker has in mind. So, what is being proposed is that the speaker can say something which the audience cannot grasp. But even worse is the fact that sometimes the speaker herself seems to say something that she cannot grasp. We agree with Braun's intuition that often we use sentences like (54) to assert that John has a way of identifying Hong Oak Yun, without having a specific method in mind:

(54) John knows who Hong Oak Yun is.

Braun's 'smart aleck' case discussed in the previous section shows the same point. The contextualist, through the free variable view, predicts a meaning which is too specific for these cases.

The contextualist has, however, a pragmatic strategy at his hand. He can claim that, even though the literal meaning of (54) is as predicted on the contextualist account, speakers intend to convey less specific meanings, which are derived via diagonalisation (see Breheny [2006] who makes a similar move in the debate on exceptional scope indefinites).

Stalnaker [1978] discusses three principles of rational communication. Only principles 1 and 3 are relevant for our purposes:

1. A proposition asserted is always true in some but not all of the worlds in the context set.

3. The same proposition is expressed relative to each possible world in the context set.

A contextualist could say that cases like (54) involve a deliberate violation (or flouting) of principle 3 [see Grice, 1975]: the speaker deliberately infringes principle 3 to thereby convey a different, less specific proposition, namely the diagonal proposition.

Illustration Suppose our context set contains the following context-worlds $\{w_{1n}, w_{1o}, w_{1d}, w_{2n}, w_{2o}, w_{2d}\}$. Assume that that in 1-worlds, John knows that Hong Oak Yun is the Head of the Department, but has never met her, and in 2-worlds he has met her at a party but he doesn't know that she is the Head of the Department. Further suppose that in n-contexts, naming is the selected method of identification, in o-contexts ostension is the selected method

of identification, and in *d*-contexts identification via description is selected. So for example in context world $w_{1,n}$ John knows that Hong Oak Yun is the Head of the Department, but has never met her, and the selected method of identification is naming. Suppose we want to update our context set with (54). The relevant part of the propositional concept for (54) is as follows:

	w_{1n}	w_{1o}	w_{1d}	w_{2n}	w_{2o}	w_{2d}
w_{1n}	T	T	T	T	T	T
w_{1o}	F	F	F	T	T	T
w_{1d}	T	T	T	F	F	F
w_{2n}	T	T	T	T	T	T
w_{2o}	F	F	F	T	T	T
w_{2d}	T	T	T	F	F	F

By principle 1, we first eliminate contexts w_{1n} and w_{2n} which would determine a non informative proposition. Here is the propositional concept for the new context set:

	w_{1o}	w_{1d}	w_{2o}	w_{2d}
w_{1o}	F	F	T	T
w_{1d}	T	T	F	F
w_{2o}	F	F	T	T
w_{2d}	T	T	F	F

Although this move narrows down our alternatives, we still cannot figure out whether we are in a *d*-context or a *o*-context, and therefore we still don't know which is the intended proposition. The speaker is deliberately violating principle 3. She must have wanted to convey the diagonal proposition.

(55) *The diagonal proposition*

	w_{1o}	w_{1d}	w_{2o}	w_{2d}
w_{1o}	F	T	T	F
w_{1d}	F	T	T	F
w_{2o}	F	T	T	F
w_{2d}	F	T	T	F

We then update with the diagonal proposition. The resulting context set contains now only two possibilities: w_{1d} and w_{2o}.

Although the diagonal proposition in (55) is not equivalent to the existential proposition the ∃-closure view would assign to (54), it does entail it and seems to be 'unspecific' enough to explain the example. It seems fair to conclude that the contextualist, when equipped with a sophisticated pragmatics, can capture cases like (54), and, arguably, in a better way than the strict invariantist, who, without stipulation, would have predicted a trivial meaning for the sentence. Instead, the contextualist, via principle 1, has a principled explanation of why resolutions which determine trivial meanings are discarded.

It is easy to check, however, that by diagonalisation alone, our contextualist cannot capture embedded unspecific readings of 'knowing wh' constructions as in:

(56) If John knows who Hong Oak Yun is, he will tell.

a. $K_a(?x_n\phi) \rightarrow \psi$ [free variable view]

b. $\exists n.K_a(?x_n\phi) \rightarrow \psi$ [$\exists$-closure view]

What it is meant here is: if John has a way of identifying Hong Oak Yun, he will tell. The $\exists$-closure view (with stipulation) captures this meaning. The contextualist view, even with the help of diagonalisation, doesn't. To see that it doesn't, consider the case where the antecedent is true in 1-worlds, and false in 2-worlds. In such case, the diagonal proposition looks as follows:

(57) *The diagonal proposition for* $K_a(?x_n\phi) \rightarrow \psi$

	w_{1o}	w_{1d}	w_{2o}	w_{2d}
w_{1o}	T	T	F	T
w_{1d}	T	T	F	T
w_{2o}	T	T	F	T
w_{2d}	T	T	F	T

while the proposition expressed by $\exists n.K_a(?x_n\phi) \rightarrow \psi$ is

(58) *The proposition for* $\exists n.K_a(?x_n\phi) \rightarrow \psi$

	w_{1o}	w_{1d}	w_{2o}	w_{2d}
w_{1o}	T	T	F	F
w_{1d}	T	T	F	F
w_{2o}	T	T	F	F
w_{2d}	T	T	F	F

Clearly, the diagonal proposition for $K_a(?x_n\phi) \rightarrow \psi$ is not equivalent nor implies the proposition for $\exists n.K_a(?x_n\phi) \rightarrow \psi$. One can see that the problem occurs when we consider context w_{2d}. Even though the antecedent is true if we adopt the existential closure view (for, under ostension, John knows who Hong Oak Yun is, and thus in 2-worlds there is a perspective under which John knows who Hong Oak Yun is), the antecedent that we get by diagonalization is false in context w_{2d} (for, under description, John does not know who Hong Oak Yun is), and thus the implication is true with respect to w_{2d}. The best approximation one can get is: there is a salient n such that if John knows who Hong Oak Yun is under n, he will tell.

To summarize, we have compared a contextualist free variable account with a strict invariantist $\exists$-closure view. The first view has serious problems of over-specification (the Hong Oak Yun case) which could only partially be solved by diagonalisation. The latter view has unsolved problems of underspecification (the card situation) and relies on a stipulation to predict informative meanings.

Two possible solutions One possible way out from our dilemma is to start with the ∃-closure view and obtain informative and specific meaning via pragmatic enrichment as in Recanati [2002]. The card example can be explained along the following lines: in this specific context the truth conditions for (59-a) are not (59-b), the one determined by logical form, but (59-c), obtained by pragmatic enrichment ($n = o$ as unarticulated component):

(59) *Implicit contextualist ∃-closure view*

a. If Ann knows which card is the winning card, then she will win 10 euro.

b. $\exists n.K_a(?x_n\phi) \rightarrow \phi$ [logical form]

c. $(\exists n.K_a(?x_n\phi) \wedge n = o) \rightarrow \phi$ [after pragmatic enrichment]

One characteristic of pragmatic enrichment, however, is that it should be optional, so we cannot rely on it to solve our first problem: the exclusion from the domain of quantification of covers that would cause trivial meaning remains a stipulation.

Furthermore pragmatic enrichment has problems of overgeneration [cf. Stanley, 2005a,b]. Not all possible unarticulated constituents should be in fact allowed. However, how to constrain the machinery in order to avoid overgeneration is far from clear.

The solution we prefer (at the moment) also starts with the ∃-closure view, but assumes existential quantification to be explicitly restricted to a contextually determined set of conceptualizations. Like in the previous solution, in this variant the ∃-closure view is no longer a representative of strict invariantism (X stands for a contextually supplied set of conceptual covers):

(60) *Explicit contextualist ∃-closure view*

a. Ann knows which card is the winning card.

b. $\exists n_X.K_a?x_n\phi$ [logical form]

Contextually restricted sets of conceptualizations will be typically very small, often singleton, sets. Evidence for the adequacy of this account can be provided by the parallel between the types of cases generating smart-aleck replies like the one provided above, and cases involving the usual kind of quantification that also generate this kind of replies:

(61) John: Is there everything in your purse?
Mary: No, I haven't put the table in it.

Just like happened with Julie's reply to her father, Mary is giving John a 'smart-aleck' reply by taking the domain of quantification to be larger than what John intended.

Furthermore, in both cases, the options open to the interrogators are the same. Either they accept the answers, thus also accepting a larger domain of quantification, or they refuse to do so.

If Julie's father were to endorse the last of these options, he could utter something in the guise of (62) as a reply:

(62) That was not what I meant, Julie. What I was asking was: who from your class are you going out with?

The same kind of reply is also available to John:

(63) That was not what I meant, Mary. What I was asking was: is there everything that you were intending to take with you in your purse?

The similar behavior between the two types of cases seems to indicate that 'smart-aleck' replies are allowed by the quantified form of the questions, and that in such cases the domain of quantification can be enlarged by contextual factors.

Adoption of an explicit contextualist ∃-closure view allows for lack of specificity problems typical of ∃-closure views to be solved by assuming (default) restrictions to singleton domains [see Schwarzschild, 2002]. Also, being an existential closure approach, the overspecification problems of the free variable view are solved as well. Being a contextualist approach, resolutions which yield trivial meanings can be ruled out without stipulation. And finally, the conceptual problems of contextualism (the audience might still fail to grasp the intended domain of quantification) can be solved by diagonalisation.

5 Conclusion

In this paper we addressed the issue of how perspectives and context interact in order to provide an adequate semantics for 'knowing who' constructions. We argued for the need of an analysis for 'knowing who' that took perspectives into consideration. Afterwards we considered the different ways that perspectives could be context-sensitive. We followed MacFarlane in his taxonomy, and saw that both relativism, and sensitive invariantism were untenable. The options were then reduced to seeing the perspective coming out from the context of use, or there being no context-sensitivity at all. Both options had problems that we tried to address. In the end we found that implicit and explicit contextualist ∃-closure views were the more appropriate in order to explain the data. Both of them have existential quantification over conceptual covers, the difference being that in the latter case the role played by context in the determination of the domain of covers is constrained by the logical form of sentence where 'knowing who' occurs. The explicit contextualist ∃-closure view had our preference for more theoretical reasons, which go back to the Stanley vs. Récanati debate on unarticulated constituents.

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