A slightly differen version appeared in *Analysis* 71(3): 478-488 , 2011

On Collection and Covert Variables[*]

IVANO CAPONIGRO AND JONATHAN COHEN

Here hills and vales, the woodland and the plain,
Here earth and water seem to strive again,
Not chaos-like together crushed and bruised,
But, as the world, harmoniously confused:
Where order in variety we see,
And where, though all things differ, all agree.
— Alexander Pope, *Windsor Forest* (1713).

1. Introduction

It has become commonplace in semantic theorizing to argue that the semantic representation of certain linguistic expressions contains covert elements in addition to what is contributed by the overt linguistic material. Theorists have pursued this strategy with respect to a wide range of constructions in a wide range of languages. A small sample of such expression types in English would include comparative adjectives (covert delineation of comparison), quantifiers (covert domain restriction), and event reports (covert location/time indexes).

For this kind of move to be suitably constrained, semanticists have developed a number of tests that are supposed to give independent evidence about whether there are in fact the covert elements postulated. These include, *inter alia*, binding (Partee 1989; von Fintel 1994; Stanley and Szabó 2000; Stanley 2002), optionality (Recanati 2004), control (Bhatt and Pancheva 2006), sluicing (Merchant 2001), and collection (Cappelen and Lepore 2006; Cappelen and Hawthorne 2009).

This note is about one of these tests in particular: the collection test. We don't want to deny the need for covert variables in the semantics that receive their values from context somehow; on the contrary, we assume (without argument) that there are such variables. Rather, our specific aim in this paper is to ask whether the collection test is a successful

[*] This work is fully collaborative; the authors are listed in alphabetical order.

diagnostic of the presence of covert elements. We'll argue that it isn't, so those who want to posit covert elements need other kinds of evidence to justify their views.

2. Collection Test: First Attempt

2.1. Collection by 'Say'

How might data about collection serve as evidence about the presence of covert variables? The thought might be put crudely as follows. Suppose an expression does harbor a covert variable, and that two people utter strings containing that expression. Then it might happen that, despite their uttering all the same overt material, the value of the covert variable differs between the two utterances; and, if so, then this could result in a distinction in the semantic value of the two utterances that would falsify the attempt to report their speech by an indirect collective report. That is, intuitively, the unavailability of a collective report shows that the two utterances in question differ in their semantic representation; but if the two utterances are identical at the overt level, then there must be a covert difference in their semantics, which means, in turn, that there must be a covert position/variable in their semantic representations where the difference could reside. That, at any rate, is the intuitive motivation for the appeal to the test.

To see the collection test in action, let us apply it to an expression that we'll stipulate (following a pretty widespread consensus) does harbor a covert variable: 'enemy'.[1] Let it be that Saddam Hussein and George W. Bush express their views about Iran by the following:

(1) SADDAM: Iran is an enemy.
(2) GWB: Iran is an enemy.

And stipulate that GWB utters (1) because he takes Iran to be an enemy of GWB (and by extension the US), Saddam utters (2) because he takes Iran to be an enemy of Saddam (and by extension Iraq), and that there's no country/government/individual *x* such that Saddam and GWB both take Iran to be an enemy of *x*. The thought behind the collection test as a diagnostic is that, because of the role of a covert variable in 'enemy', we

[1] We suppose the thought behind the pretty widespread consensus is that one can't be an enemy *simpliciter*, but only an enemy of this or that individual/state/entity.

cannot correctly describe what Saddam and GWB say about Iran by the collective disquotational indirect report (3):

(3) Saddam and GWB say that Iran is an enemy.[2]

In other words, the thought is that non-identity in the values assigned to covert variables blocks collection by 'say'. Therefore, when collection fails, and there is no mismatch in overt material to explain the failure, then there must be mismatching covert material — *a fortiori* there must be covert material.

2.2. Failure and Diagnosis

As we say, several writers have relied on this kind of evidence (viz., the failure of collection) as a way of arguing for the presence of covert variables. However, it seems to us that there *is* a true reading of (3), which can be brought out by placing it in the following discourse fragment:

> Saddam and GWB disagree about many things: they have completely different social, military, and political interests. But if you ask them what they think of Iran, at least, they are not so far apart. Saddam and GWB say that Iran is an enemy.

If there is in fact such a true reading of (3) in the circumstances envisaged, then the argument just canvassed is unsound. Of course, the failure of the argument doesn't show that 'enemy' lacks a covert variable — indeed, we continue to believe that it has one. But it does raise the question of how (3) could have a true reading. How, that is, could collection succeed, given the assumption that (1) and (2) differ at a covert level of semantic representation, and therefore, presumably, in the total semantic content they express?

A plausible answer, suggested by Stanley (2005: 50–51) and Cappelen and Hawthorne (2009: 45–50), is that indirect collection reports like (3) have a reading that collects λ-abstracts — i.e., a reading

[2] Read 'say' in (3) as referring to two separates events of saying, one by Saddam, the other by GWB, rather than a single event of joint saying. We don't want the rejection of (3) and its ilk to turn on the non-occurrence (or non-recognition of) events of joint saying/agreeing/etc. This is even more important for examples below involving 'agree' (cf. Cappelen and Hawthorne 2009: 60–61). Similarly, we prefer to use those verbs in the present tense rather the present perfect or past ('Saddam and GWB (have) said/agreed that Iran is an enemy') which we hear as carrying the same (unwanted) connotation even more strongly.

that can be represented as a conjunction of (or quantification over) instances of a single λ-abstract, where each instance applies to different individual-denoting arguments.

Before showing how this works in (3), we pause to note that collection by sharing a λ-abstract occurs in many other constructions as well. For example, if student s_1 passed the test that s_1 took, student s_2 passed the test that s_2 took, and student s_3 passed the test that s_3 took, we can collect their academic successes by uttering

(4) Every student passed.

The possibility of collecting in this way is explained by the students' sharing the property of passing the test that he or she took. That is (in a universe in which s_1, s_2, and s_3 are the only students), (4) is true because ⌜λ*x*(*x* passed the test that *x* took)s_1⌝ is true, and ⌜λ*x*(*x* passed the test that *x* took)s_2⌝ is true, and ⌜λ*x*(*x* passed the test that *x* took)s_3⌝ is true.

Likewise, the thought is that, even if there is no country/government/individual *x* such that Saddam and GWB both take Iran to be an enemy of, nonetheless their respective utterances of (1) and (2) make it the case that Saddam and GWB share a property — the property of saying that someone is an enemy of themselves. I.e., their respective utterances of (1) and (2) make it the case that the two share this property: λ*x*(*x* says that Iran is an enemy of *x*). Given this fact, we can attribute the success of (3) to its having a (reasonably salient) reading with the truth condition in (5), which happens to be met in the case described:

(5) λ*x*(*x* says that Iran is an enemy of *x*) Saddam &
λ*x*(*x* says that Iran is an enemy of *x*) GWB.

This move strikes us as pretty plausible as an explanation of how collection test, as formulated so far, can fail to disclose covert variables. In fact, further support for this explanation comes from the observation that so-called sloppy identity readings in VP ellipsis (readings involving bound variables inside λ-abstracts that are interpreted as coreferring with different antecedents in different clauses) are (at least) seriously degraded in contexts where antecedents fail to c-command the bound variables at issue (Reinhart 1983: 151ff).[3] Thus, for example the sloppy reading is fine in (6), but degraded in (7). The apparently similar contrast

[3] Thanks to Andrew Kehler for urging this point on us.

between (8) and (9) is explicable on the hypothesis that 'enemy' harbors a covert variable that can be bound by a λ-quantifier, as proposed for (3) above. (We'll return to this point below.)

(6) John's mother likes him and Bill's mother does too. (strict/sloppy)

(7) The person who gave birth to John likes him and the person who gave birth to Bill does too. (strict/? *sloppy)

(8) Saddam's allies are providing support to an enemy and GWB's allies are too. (strict/sloppy)

(9) Former business associates of Saddam are providing support to an enemy and former business associates of GWB are too. (strict/*sloppy)

It would appear, then, that collection by 'say' is permissible even when (as we are assuming about the case above) there is real disagreement in the values assigned to covert variables within its scope. If so, then collection by 'say' won't serve as an effective diagnostic for the presence of covert variables.

3. Collection Test: Second Attempt

3.1. Collection by 'Agree'?

Suppose (as we suspect) it is true that collection succeeds even when there are covert variables present in what is collected because indirect collection reports employing the complement-taking verb 'say' always/often have readings that collect λ-abstracts. One might nonetheless hope to resuscitate the diagnostic power of collection by finding a complement-taking verb that, unlike 'say', does not allow for collection of λ-abstracts. The thought would be that, if this loophole form of collection is taken off the table (for whatever reason), we can expect that indirect collection reports will succeed only when the parties over whom we are collecting bear the very same propositional attitude to the very same content — hence that differences in the values assigned to covert variables will make for collection-blocking differences in total content. If so, then it would once again be possible to test for the presence of covert variables by inquiring about the possibility of indirect report collection by this new complement-taking verb.

Cappelen and Hawthorne (2009: 54ff.) defend the collection test on exactly these grounds. They propose that, even if collection by 'say' fails for the reason we have discussed, collection by 'agree' will not fail in the same way. Their main reason for this contention is their observation that 'agree' is non-distributive:

> Remember how we explained the acceptability of (26) ('A and B said that Naomi went to a nearby beach') and (29) ('A and B said that Naomi turned left'): lambda abstraction gives us a true reading of the collective report, even in cases where the sentence in question contains an obviously context-sensitive term. For interesting reasons, lambda abstraction will not give us a true reading when the sentence in question contains 'agree'. The reason is that it is hard to hear a reading of 'agree' reports according to which 'agree' distributes over the individuals in question. In this respect, 'agree' is like 'scatter', 'disperse', and 'share'. …'Agree', being non-distributive, requires us to find a content common to A and B, in a way that collections using 'say that', for example, do not (Cappelen and Hawthorne 2009: 56–57).

The non-distributivity of the verb is, of course, essential to the success of the λ-abstraction strategy pursued above. It is simply essential to understanding (3) in terms of (5) that the two parties — here Saddam and GWB — count as being collectively related by 'say' to the very same (λ-abstracted) proposition by virtue of their individually being related by 'say' to that proposition. Therefore, Cappelen and Hawthorne urge that the strategy will break down for a non-distributive verb such as 'agree'.

3.2 . Failure and Diagnosis

We accept, with Cappelen and Hawthorne, that 'agree' is unlike 'say' in not being distributive. And we agree with them that the non-distributivity of 'agree' blocks the strategy that they employed to show why/how an indirect collective report might succeed in collecting even across differences in the values of covert variables (hence in total content). But we don't believe that this restores collection to being an effective test for the presence of covert variables in the way that Cappelen and Hawthorne suggest. For we believe that (10), the

'agree'-based counterpart of the collective report (3), has a true reading in the circumstance where Saddam and GWB each sincerely asserts 'Iran is enemy' but where there's no country/government/individual whom they jointly take Iran to be an enemy of.

(10) Saddam and GWB agree that Iran is an enemy.

For example, even on the stipulation that there's no country/government/individual whom Saddam and GWB jointly take Iran to be an enemy of, we and several native English speaking informants found (10) felicitous as part of the following discourse fragment:

> Saddam and GWB disagree about many things: they have completely different social, military, and political interests. But if you ask them what they think of Iran, at least, they are not so far apart. Saddam and GWB agree that Iran is an enemy.

(Note that accepting the stipulation blocks the reading of (10) on which a covert variable triggered by 'enemy' is bound by the plural individual comprised of Saddam and GWB; since our informants continued to find the string felicitous even under the stipulation, the collection can't be explained in terms of that reading.)

If this is correct, and if (as per Cappelen and Hawthorne) 'agree' is non-distributive, then there must be some other story — one distinct from that involving λ-abstraction discussed in §2.2 — about how collection with 'agree' can work. So what is going on? [4]

[4] In fact, though Cappelen and Hawthorne (2009) say that the non-distributivity of 'agree' blocks the λ-abstraction-based exception to the collection test, they should in principle be open to our contention that there is some other way in which 'agree' permits collection over mismatches in covert variables. For, according to them, the way to use collection as a test for hidden variables is to look for *failures* rather than *successes* in collection:

> …we conclude that the unavailability of a true reading of 'They agree that S' is a tell-tale sign of context dependence for 'S' when faced with two sincere utterances of S, the availability of a true reading of 'The agreed that S' in a case where two subjects sincerely assert 'S' is by no means a surefire sign that 'S' had the same semantic value in the mouth of each subject' (63).

Does this drain the interest from our claim that the collection in (10) is successful? We think not. First, we believe it is important to see that the λ-abstraction story is not the only route to successful collection across covert mismatches (and specifically for

We suggest that the collection with 'agree' works because covert variables can behave like logophors, along the lines of 'his/her/their own'. We present this suggestion in a few steps.

First, note that the form 'their' in (11) can refer to the same plural individual as the matrix subject 'GWB and Saddam' or to another plural individual previously mentioned or made salient in the discourse/context. But, as shown in (12), it cannot refer to the same individual as the embedded subject 'Iran and Syria', even though the number mismatch (singular vs. plural) has been taken care of. This behavior is typical of pronouns: they can take an antecedent (i.e., an expression that c-commands them and agrees in gender, number, and person with them) within the same sentence, but not "too close".

(11) GWB and Saddam agree that Iran is their enemy.

(12) GWB and Saddam agree that Iran and Syria are their enemies.

In contrast, notice that the form 'themselves' in (13) cannot take the matrix subject as its antecedent, but only the embedded subject 'Iran and Syria'. This behavior is typical of anaphors: they need to have an antecedent that is "close enough". Finally, the form 'their own' in (14) can take the matrix subject as its antecedent, like a pronoun, but, unlike a pronoun, it cannot refer back to a previously mentioned or contextually salient individual. Notice also that if the embedded subject agrees in number with 'their own', the two can corefer (15). This behavior is typical of logophors. The antecendet of a logophor is semantically or pragmatically more constrained than that of a pronoun; but it doesn't need to be within the same clause, unlike that of anaphor. The antecedent of a logophor is the "source" of the proposition conveyed by the clause the logophor is part of. In (14), for instance, the logophor 'their own' occurs within the embedded clause denoting the proposition 'that Iran is the enemy of GWB and Saddam'. The plural individual composed of GWB and Saddam, and the atomic individuals GWB and Saddam are

collection across covert mismatches within the scope of 'agree') and to understand what at least one of the alternative routes might consist in. Second, we note that collection by 'agree' has been offered as *the* paradigm expression for which collective reports will be unavailable. But if we are right that such reports are available after all, this casts doubt on the idea that there is a single expression type for which collective reports will be generally unavailable. If, as Cappelen and Hawthorne claim, the collection test is correctly applied by finding contexts where collection is unavailable/impossible, then the worry that there aren't any is tantamount to the worry that the test is inapplicable.

candidate sources of this proposition, since they are the individuals overtly mentioned as believing it to be true. But since the plural individual composed of GWB and Saddam is the only one of the candidates that matches the plural marking on 'their own', this plural individual is the antecedent of the logophor.[5]

(13) GWB and Saddam agree that Iran and Syria are enemies of themselves.

(14) GWB and Saddam agree that Iran is their own enemy.

(15) The committee agrees that Iran and Syria are their own enemies.

Interestingly, a minority of our consultants judged (16) acceptable and interpreted the version with 'his own' as equivalent to our crucial example with the covert variable, (10), repeated here for convenience.

(16) GWB and Saddam agree that Iran is his (own) enemy.

(10) GWB and Saddam agree that Iran is an enemy.

Our suggestion is that the covert variable in (10) is a singular logophor like the overt forms 'his own' or 'her own'. A characterizing property of these logophors is that they do not need to agree in number with their antecedent: 'GWB and Saddam' is plural, while 'his own' is singular. A consequence of singular number on 'his own' is that the logophor can pick up the atomic individuals GWB and Saddam as its antecedent, rather than the plural individual composed of GWB and Saddam.[6] In addition, logophors exhibit the same distributive properties

[5] See Büring (2004) for an overview of the interpretative facts and theories about pronominal and anaphoric expressions, including logophors; see Sells (1987) for a specific syntactic/semantic account of logophoricity within Discourse Representation Theory (Kamp 1981).

[6] This behavior of 'his own' raises an interesting puzzle. Assuming (standardly) that GWB and Saddam must both believe the very same proposition in order for a collective report like (16)/(10) to be true, just what could that single proposition be? Recall that, according to our informants, the truth of (16)/(10) does not require GWB and Saddam to share any thought about which individual Iran is an enemy of — viz., the set of entities GWB takes Iran to be an enemy of need not overlap with the set of entities Saddam takes Iran to be an enemy of. But if so, it's hard to see what common singular proposition (16)/(10) could report GWB and Saddam as agreeing on. (See Caponigro and Cohen (2011) for a more thorough discussion of this puzzle and its possible solutions.)
Puzzling though this is, note that the puzzle arises for cases of collection across mismatched overt logophors such as 'his/her/their own' (e.g., in (16)) just as with (10).

as anaphoric expressions. (17) contains the anaphor ‘themselves’ and can only mean that GWB and Saddam as a unit hate themselves as a unit, or, more naturally, that GWB hates himself and Saddam hates himself. Crucially, it cannot mean that GWB hates Saddam and Saddam hates GWB. A reciprocal anaphor like ‘each other’ has to be used to convey that meaning, as in (18).

(17) GWB and Saddam hate themselves.

(18) GWB and Saddam hate each other.

Like (17), our sentence with a covert variable in (10) can receive the preferred reading according to which GWB has the thought that Iran is the enemy of GWB (and, by extension the US), and Saddam has the thought that Iran is the enemy of Saddam (and, by extension, of Iraq). It can also have the dispreferred (because false by stipulation in our scenario) reading that GWB and Saddam perceive themselves as a plural unit and as such they have the thought that Iran is enemy of them as a unit. But it cannot be interpreted as meaning that GWB has the thought that Iran is the enemy of Saddam (and, by extension, of Iraq), and Saddam has the thought that Iran is the enemy of GWB (and, by extension the US).

We suggest that whatever binding mechanism accounts for the behavior of anaphors vs. reciprocals in (17) and the behavior of ‘his own’ in (16) (at least, for those speakers that can accept the sentence), is also at work in explaining the behavior of the covert variable of ‘enemy’ in (10) as well. (As we pointed out at the end of §2.2, the degradation of sloppy identity readings in VP ellipsis in contexts where antecedents fails to c-command the bound variables at issue gives independent reason for treating the collection in (10) as a binding phenomenon.)

Two further remarks before concluding. We are claiming that the covert variable of ‘enemy’ can be a logophor, but we do not claim it must always work this way. There are contexts in which it instead behaves like a free pronoun unspecified for number, gender, or person, and whose reference is contextually determined; thus, for example, in appropriate contexts, (19) can mean what the variants in (20) mean (in

---

Thus, we are proposing that whatever explains how ‘agree’ permits collection across mismatched overt logophors, as in (16), will similarly explain how ‘agree’ permits collection across mismatched covert variables, as in (10).

which overt personal pronouns varying by number, person, and gender occur).

(19) Iran is an enemy.

(20) Iran is my/your/his/her/their enemy.[7]

Second, though we have focused our argument around 'enemy' and similar lexical items, we believe that our proposal can account for collection involving other kinds of lexical items carrying covert variables, such as (we assume) gradeable adjectives. Thus, for example, consider (21), involving the gradeable adjective 'tall', in the following situation. Suppose Joe is 6'6". The high school basketball coach is looking for a point guard and thinks/says that Joe is tall. The pro basketball scout is looking for a point guard, and thinks/says that Joe is tall. Presumably the standard for the application of 'tall' for the high school coach involves the heights of high school basketball players, while the standard for the application of 'tall' for the pro scout involves the (significantly greater) heights of professional basketball players. Nonetheless, to our ears, (21) is a fully acceptable true sentence in this context, and means something very close to (22), where a logophor occurs as part of the preposition phrase conveying the standard.

(21) The high school coach and the pro scout agree that Joe is tall.

(22) The high school coach and the pro scout agree that Joe is tall according to his/her (own) standards.

4. Conclusion

Generalizing, the lesson here seems to be that that 'agree' can, like other constructions, collect in (at least) two ways: (i) it can collect propositions that are alike in constituents corresponding to overt material and alike in the values assigned to covert variables; and (ii) it can collect propositions that are alike in constituents corresponding to overt material but not alike in the values assigned to covert variables. But this lesson undercuts the power of the collection test using 'agree' to detect covert variables. For if we are right that 'agree' can collect in both

[7] Though we find the reading of (19) corresponding to 'Iran is your enemy' less salient than those corresponding to the other versions of (20), we believe it is available in some contexts. Suppose I am the president of a country with whom Iran and Iraq are both allies, even though Iran and Iraq are at war. In this setting I can felicitously utter (19) with the intended second-person reading to warn my Iraqi interlocutor about Iran.

these ways, then mismatch in the values assigned to covert variables *won't block collection by 'agree'*.[8] We conclude, therefore, that collection by 'agree' is an ineffective diagnostic for the presence of covert variables.[9]

Department of Linguistics,
University of California, San Diego
9500 Gilman Drive, 0108
La Jolla, CA 92093-0108
ivano@ucsd.edu

Department of Philosophy
University of California, San Diego
9500 Gilman Drive
La Jolla, CA 92093-0119
joncohen@aardvark.ucsd.edu

References

Bhatt, R. and Pancheva, R. 2006. Implicit arguments. In *The Blackwell Companion to Syntax*, ed. M. Everaert and H. van Reimsdijk, 554–584. Oxford: Basil Blackwell.

Büring, D. 2004. *Binding Theory*. Cambridge: Cambridge University Press.

Caponigro, I. and Cohen, J. 2011. What do they agree on? : A puzzle about logophoricity and agreement. In progress.

[8] Of course, if we had independent ways of knowing whether what is collected is a λ-abstract or involves covert logophors (or, for that matter, any other mechanism that permits collection despite differences in the assignments made to covert variables), then we might be able to set aside such cases and apply the collection diagnostic only to what remains. But because it's hard to see how we could identify these sorts of cases without first knowing that covert variables are present, this doesn't appear to be a promising route to the detection of covert variables either.

[9] We are grateful for feedback from the UCSD Semantics Babble group, and especially from Andrew Kehler, and for comments from Eliot Michaelson, Jessica Rett, Jonathan Schaffer, Adam Sennet, and Jason Stanley. The authors are solely responsible for any remaining mistakes.

Cappelen, H. and Hawthorne, J. 2009. *Relativism and Monadic Truth*. Oxford: Oxford University Press.

Cappelen, H. and Lepore, E. 2006. Replies. *Philosophy and Phenomenological Research* 73(2): 469–492.

von Fintel, K. 1994. *Restrictions on Quantifier Domain*. Ph.D. thesis, University of Massachusetts at Amherst, Mass.

Kamp, H. 1981. A theory of truth and semantic representation. In *Formal Methods in the Study of Language*, ed. J. Groenendijk, T. Janssen, and M. Stokhof, 277–321. Amsterdam: Mathematical Centre Tracts.

Merchant, J. 2001. *The Syntax of Silence: Sluicing, Islands, and the Theory of Ellipsis*. Oxford: Oxford University Press.

Partee, B. 1989. Binding implicit variables in quantified contexts. *Proceedings of the 25th Chicago Linguistics Society (CLS 25)*, ed. C. Wiltshire, B. Music, & R. Graczyk, 342-365. Chicago: Chicago Linguistic Society.

Recanati, F. 2004. *Literal Meaning*. Cambridge: Cambridge University Press.

Reinhart, T. 1983. *Anaphora and Semantic Interpretation*. Chicago: University of Chicago Press.

Sells, P. 1987. Aspects of logophoricity. *Linguistics Inquiry* 18(3): 445–479.

Stanley, J. 2002. Nominal restriction. In *Logical Form and Language*, ed. G. Preyer and G. Peter, 365–388. Oxford: Oxford University Press.

Stanley, J. 2005. Semantics in context. In *Contextualism and Philosophy: Knowledge, Meaning, and Truth*, ed. G. Preyer and G. Peter, 221–253. Oxford: Oxford University Press.

Stanley, J. and Szabó, Z. 2000. On quantifier domain restriction. *Mind and Language* 15: 219–261.