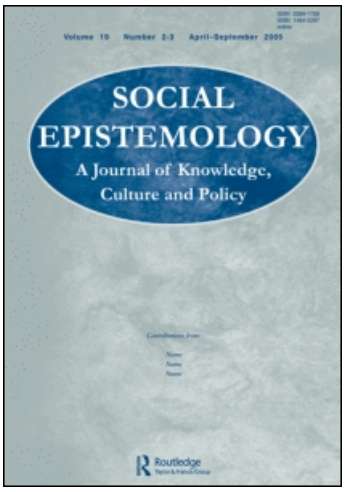

Social Epistemology
Publication details, including instructions for authors and subscription information:
http://www.informaworld.com/smpp/title~content=t713765921

The Contrast-sensitivity of Knowledge Ascriptions

Jonathan Schaffer

Online Publication Date: 01 July 2008

To cite this Article Schaffer, Jonathan(2008)'The Contrast-sensitivity of Knowledge Ascriptions',Social Epistemology,22:3,235 — 245
To link to this Article: DOI: 10.1080/02691720802546112
URL: http://dx.doi.org/10.1080/02691720802546112

Social Epistemology
Vol. 22, No. 3, July–September 2008, pp. 235–245

Routledge
Taylor & Francis Group

The Contrast-sensitivity of Knowledge Ascriptions

Jonathan Schaffer

*Knowledge ascriptions are contrast-sensitive. One natural explanation for this is that the knowledge relation is contrastive (*s *knows that* p *rather than* q*). But can the binary view of knowledge (*s *knows that* p*) explain contrast-sensitivity? I review some of the linguistic data supporting contrast-sensitivity, and critique the three main binary explanations for contrast-sensitivity. I conclude that the contrast-sensitivity of knowledge ascriptions shows that knowledge is a contrastive relation.*

Keywords: Contrastivism; Knowledge

Knowledge ascriptions are contrast-sensitive. That is, our intuitions about whether knowledge obtains depend not only on the subject *s* and the proposition *p*, but also on which contrast proposition *q* is in question. So the contrastivist argues that the knowledge relation has the ternary, contrastive form K*spq* (*s* knows that *p* rather than *q*).[1] But is contrastivism the only option? Can the binary view of knowledge as K*sp* explain the contrast-sensitivity of knowledge ascriptions? In what follows, I will review some of the linguistic data supporting contrast-sensitivity. I shall then critique the three main binary explanations for contrastive-sensitivity, all of which attempt to reduce contrastive locutions to binary constructions. Thus I will conclude that contrastivism is indeed the only option—the contrast-sensitivity of knowledge ascriptions shows that knowledge is a contrastive relation.

The Contrastive Data

Knowledge ascriptions are contrast-sensitive. That is, our intuitions about whether knowledge obtains depend not only on the subject *s* and the proposition *p*, but also on which contrast proposition *q* is in question. The data arise from the following pairs of

Jonathan Schaffer is Professor of Philosophy in the Research School of Social Sciences, at the Australian National University. His main interests are in metaphysics and epistemology. Correspondence to: Jonathan Schaffer, Philosophy Program, Research School of Social Sciences, The Australian National University, Canberra ACT 0200, Australia. Email: jonathan.schaffer @anu.edu.au

ISSN 0269–1728 (print)/ISSN 1464–5297 (online)
DOI: 10.1080/02691720802546112

cases. (At this point, the reader should clear her mind, exhale, and merely try to summon her natural intuitions.)

Who/what:

(a) Mary has stolen the bicycle from the toy store. The detective finds Mary's fingerprints at the crime scene. Does the detective know who stole the bicycle?

(b) Mary has stolen the bicycle from the toy store. The detective finds Mary's fingerprints at the crime scene. Does the detective know what Mary stole?

Whether:

(c) Mary has stolen the bicycle from the toy store. The detective finds Mary's fingerprints at the crime scene. Does the detective know whether Mary or Peter stole the bicycle?

(d) Mary has stolen the bicycle from the toy store. The detective finds Mary's fingerprints at the crime scene. Does the detective know whether Mary stole the bicycle or the wagon?

Rather:

(e) Mary has stolen the bicycle from the toy store. The detective finds Mary's fingerprints at the crime scene. Does the detective know that Mary rather than Peter stole the bicycle?

(f) Mary has stolen the bicycle from the toy store. The detective finds Mary's fingerprints at the crime scene. Does the detective know that Mary stole the bicycle rather than the wagon?

Cleft:

(g) Mary has stolen the bicycle from the toy store. The detective finds Mary's fingerprints at the crime scene. Does the detective know that it was Mary that stole the bicycle?

(h) Mary has stolen the bicycle from the toy store. The detective finds Mary's fingerprints at the crime scene. Does the detective know that it was a bicycle that Mary stole?

Focus:

(i) Mary has stolen the bicycle from the toy store. The detective finds Mary's fingerprints at the scene. Does the detective know that *Mary* stole the bicycle?

(j) Mary has stolen the bicycle from the toy store. The detective finds Mary's fingerprints at the scene. Does the detective know that Mary stole *the bicycle*?

Presupposition:

(k) *Someone* has stolen the bicycle from the toy store. The detective finds Mary's fingerprints at the crime scene. Does the detective know that Mary stole the bicycle?

(l) Mary has stolen *something* from the toy store. The detective finds Mary's fingerprints at the crime scene. Does the detective know that Mary stole the bicycle?

I, and virtually all of my informants, intuit that the detective knows in all of the (a) cases, and does not know in any of the (b) cases. There is a pattern here. All of the cases involve linguistic mechanisms for encoding contrasts—questions, "rather than" clauses, clefts, foci, and presuppositions all serve to set contrasts.[2] What controls our intuitions across the (a)/(b) pairs is the shift in what is in contrast. Roughly, in the (a) cases the contrasts are alternative thieves, which the fingerprint evidence rules out; while in the (b) cases the contrasts are alternative thefts, which the fingerprint evidence does not touch.[3]

It is natural to take the contrastive data as an argument for contrastivism. That is, the most direct explanation of why knowledge ascriptions are contrast-sensitive is that the knowledge relation has a contrast slot. On the contrastivist explanation, we are correctly intuiting in the (a) cases that $Kspq_1$, and correctly intuiting in the (b) cases that $\sim Kspq_2$. How might the binary theorist explain contrast-sensitivity, without a *q*-slot? It would seem that she has three possible lines: she might reject the data; she might try to explain away the data on pragmatic or error-theoretic grounds; or she might accept the data and offer a semantic explanation, within the K*sp* framework. In the next three sections I shall focus on the third option, and consider the three main semantic explanations the binary theorist might offer. In the final section I will cast a parting glance at the remaining two options.

The Conditionals Strategy

The conditionals strategy is one strategy for offering a semantic explanation of the contrastive data within the K*sp* framework. The idea is to analyse away the contrast as the antecedent of some sort of conditional, so that "*s* knows that *p* rather than *q*" is treated as: $Ks((p \vee q) \rightarrow p)$. Thus the (a) cases would become: the detective knows that (if Mary stole the bicycle or Peter stole the bicycle, then Mary stole the bicycle), while the (b) cases would become: the detective knows that (if Mary stole the bicycle or Mary stole the wagon, then Mary stole the bicycle). And so the (a) and (b) cases would have the opportunity to differ in truth-value, within a binary framework.[4]

The conditionals strategy is flexible with respect to what sort of conditional to invoke. One might, for instance, try material, indicative, or subjunctive conditionals.[5] All that matters so far is that the knowledge relation itself retains binary K*sp* form, and that a semantic explanation for the contrastivist data is available.

There are two main problems with the conditionals strategy. The first problem is the problem of *linguistic plausibility*. In general, the best semantic treatment of questions, "rather than" clauses, clefts, foci, and presuppositions is in terms of contrasts. Semantic sensitivity to these features is sensitivity to the contrasts. There are no conditionals in these constructions. The thought that contrastive constructions can be analysed via conditionals seems to be a pure invention, fabricated solely to fit the knowledge

ascription data onto the Procrustean bed of K*sp*. It does not fit a general compositional approach to the meaning of the sentences in question.

The second main problem with the conditionals strategy is the problem of *false antecedents*. So suppose again that Mary has stolen the bicycle from the toy store, and consider the following variant of *Rather*:

Rather

(c) Mary has stolen the bicycle from the toy store. The detective finds Mary's fingerprints at the crime scene. Does the detective know that Peter rather than Paul stole the bicycle?

I take it as intuitively obvious that the detective does not know in *Rather* (c). Intuitively, *Rather* (c) violates the factivity of knowledge. The detective cannot know that Peter rather than Paul stole the bicycle, unless it was Peter who actually stole the bicycle. Likewise consider the following further variant of *Rather*:

Rather

(d) Mary has stolen the bicycle from the toy store. The detective finds Mary's fingerprints at the crime scene. Does the detective know that Paul rather than Peter stole the bicycle?

I take it as intuitively obvious that the detective does not know in *Rather* (d), for the same reasons of factivity. Further, I take it to be intuitively obvious that the detective cannot possibly know in both *Rather* (c) and *Rather* (d). The detective cannot possibly know *both* that Peter rather than Paul stole the bicycle *and* that Paul rather than Peter stole the bicycle. Finally consider:

Rather

(e) Mary has stolen the bicycle from the toy store. The detective finds Mary's fingerprints at the crime scene. Does the detective know that ((either Peter or Paul stole the bicycle) rather than that $2 + 2 = 5$)?

I take it as intuitively obvious that the detective does not know in *Rather* (e), again for reasons of factivity, as neither Peter nor Paul actually stole the bicycle.

The problem of false antecedents is that claims like *Rather* (c), *Rather* (d), and *Rather* (e) will come out true on the various implementations of the conditionals strategy, since they will involve knowledge of conditionals with false antecedents. Starting with the implementation with material conditionals, *Rather* (c) will become: the detective knows that ((Peter stole the bicycle or Paul stole the bicycle) $\supset$ (Peter stole the bicycle)). This is knowledge of a conditional proposition with a false antecedent, so there is no possible violation of factivity—the proposition under K has come out true. Indeed, with a minimum of logical acumen, the detective should be able to use the evidence of Mary's fingerprints to verify the proposition under K. So *Rather* (c) should come out true.[6] Things get worse. By parallel reasoning, *Rather* (d) should also come out true. So on this implementation of the conditionals strategy, not only is it possible for the detective to know in both *Rather* (c) and *Rather* (d), such is to be expected.

Moving to indicative conditionals will not solve the problem.[7] Here *Rather* (e) will become: the detective knows that (((Peter stole the bicycle or Paul stole the bicycle) or 2 + 2 = 5)) ⇒ (Peter stole the bicycle or Paul stole the bicycle)). This is knowledge of a conditional proposition of the form $((p \vee q) \Rightarrow p)$, where q is obviously false. So with just a bit of logical acumen, the detective should be able to reduce it to the triviality: $p \Rightarrow p$, and so verify the proposition under K. So on this implementation of the conditionals strategy, not only is it possible for the detective to know in *Rather* (e), such is to be expected.

Moving to subjunctive conditionals will not solve the problem, either. Here *Rather* (c) will become: the detective knows that ((Peter stole the bicycle or Paul stole the bicycle) > (Peter stole the bicycle)). Now suppose that the nearest possible world in which (Peter stole the bicycle or Paul stole the bicycle) is a world in which Peter stole the bicycle. Perhaps Peter was nearer to the scene of the crime, so that it would have taken less of a departure from actuality for Peter to do the thieving than for Paul. Then *Rather* (c) involves knowledge of a true subjunctive conditional, so there is no possible violation of factivity—the proposition under K has come out true. Indeed, with a bit of information about where Peter and Paul were at the relevant time, and a decent grasp of the subjunctive, the detective should be able to use the evidence of Mary's fingerprints to verify the proposition under K. So *Rather* (c) should be expected to come out true.

In summary, the conditionals strategy cannot explain the contrast-sensitivity of knowledge ascriptions. The analysis it provides is neither linguistically plausible nor intuitively adequate in cases of false antecedents. If the binary theorist is to pursue a semantic explanation for contrast-sensitivity, perhaps he/she should look elsewhere.

The Conjunctions Strategy

The conjunctions strategy is a second strategy for offering a semantic explanation of the contrastive data within the K*sp* framework. The idea is to analyse away the contrast as a negated conjunct of what is known, so that "*s* knows that *p* rather than *q*" is treated as: K*s*(p&~q). Thus the (a) cases would become: the detective knows that (Mary stole the bicycle & Peter did not steal the bicycle), while the (b) cases would become: the detective knows that (Mary stole the bicycle & Mary did not steal the wagon). And so the (a) and (b) cases would have the opportunity to differ in truth-value, within a binary framework.[8]

There are two main problems with the conjunctions strategy. The first problem is the problem of *linguistic plausibility*. This is exactly the same as the first problem for the conditionals strategy. In general, the best semantic treatment of questions, "rather than" clauses, clefts, foci, and presuppositions is in terms of contrasts, not conjunctions. Semantic sensitivity to these features is sensitivity to the contrasts. There are no conjunctions in these constructions. The thought that contrastive constructions can be analysed via conjunctions seems to be a pure invention, fabricated solely to fit the knowledge ascription data onto the Procrustean bed of K*sp*. It does not fit a general compositional approach to the meaning of the sentences in question.

The second main problem with the conjunctions strategy is the problem of *closure*. That is, the conjunctions strategy does not allow the (a) and (b) cases enough of an opportunity to differ in truth-value, since it renders knowledge in the (b) cases just-a-trivial-closure-inference-away from knowledge in the (a) cases. On the conjunctions strategy, *Rather* (a) becomes: the detective knows that (Mary stole the bicycle & Peter did not steal the bicycle). Since (Mary stole the bicycle & Peter did not steal the bicycle) entails (Mary stole the bicycle), the detective is just a trivial closure inference away from knowing that Mary stole the bicycle. And since (Mary stole the bicycle) plus the conversationally implicated premise that (Mary stole only one item)[9] entails (Mary did not steal the wagon), the detective is now just a trivial closure inference away from knowing that (Mary stole the bicycle & Mary did not steal the wagon)—which is what *Rather* (b) becomes on the conjunctions strategy.

To place the problem of closure in a different light, consider what could comprise the detective's ignorance in the (b) cases, on the conjunctions strategy. When the detective does not know that (Mary stole the bicycle & Mary did not steal the wagon), it would seem that this would either be because he does not know that Mary stole the bicycle, or because he does not know that Mary did not steal the wagon (or both). So which is it? Does the detective not know that Mary stole the bicycle? But then the conjunctions strategy would fail to deliver knowledge in the (a) cases. Does the detective not know that Mary did not steal the wagon? But since Mary's stealing the bicycle contrasts with Mary's stealing the wagon, how could the detective fail to know that Mary did not steal the wagon, save by gross logical blunder?

In summary, the conjunctions strategy cannot explain the contrast-sensitivity of knowledge ascriptions. The analysis it provides is neither linguistically plausible nor intuitively fitting as to how different the (a) and (b) cases are. If the binary theorist is to pursue a semantic explanation for contrast-sensitivity, perhaps he/she should continue to look elsewhere.

The Adjunctions Strategy

The adjunctions strategy is the third (and final) strategy I shall consider here for offering a semantic explanation of the contrastive data within the K*sp* framework. The idea is to analyse away the contrast as a mere adjunct of what is known, so that "*s* knows that *p* rather than *q*" is treated as: Ksp_{adj}, where p_{adj} is the proposition that *p* rather than *q*.[10] Thus the (a) cases would become: the detective knows that (Mary rather than Peter stole the bicycle), while the (b) cases would become: the detective knows that (Mary stole the bicycle rather than the wagon). And so the (a) and (b) cases would have the opportunity to differ in truth-value, within a binary framework.[11]

There are two main problems with the adjunctions strategy, however implemented. The first problem is the problem of *linguistic plausibility*. This is somewhat different from the first problem for both the conditionals and conjunctions strategies. The adjunctions strategy is plausibly treating questions, "rather than" clauses, clefts, foci, and presuppositions as introducing contrasts. The implausibility of the adjunctions strategy is that it then renders the contrasts as adjuncts to the known proposition *p*,

rather than as an independent third argument of K (the *q* argument in K*spq*). To see this, compare how contrast clauses behave as adjuncts to binary relations, versus how contrast clauses behave as arguments of ternary relations. Here are some examples of contrast clauses as adjuncts:

Adjuncts:
Eat: We ate hamburgers rather than hot dogs.
Put: I put the car in the garage, rather than leaving it out in the rain.

And here are some examples of contrast clauses as arguments:

Arguments:
Surprise: Ann was surprised that Cindy kissed Billy, rather than kissing Tommy.
Regret: I regret that Bush is president rather than Kerry.[12]

The reason for thinking that the contrast clauses really are arguments in the *Arguments* cases is that they control the truth-value of the proposition. One might prefer that the Red Sox win the World Series, rather than that the Cardinals win; but not prefer that the Red Sox win the World Series, rather than that the Mets win. One might be surprised that Cindy kissed Billy rather than Tommy; but not be surprised that Cindy rather than Sally kissed Billy. And one might regret that Bush is president rather than Kerry, but not regret that Bush is president rather than Cheney. Whether you prefer something, are surprised by something, or regret something, depends on which alternatives you have in mind.[13]

But the very reason for thinking that the contrast clauses really are arguments in the *Arguments* cases is equally reason for thinking that the contrast clauses really are arguments of the knowledge relation. The contrastivist data show that the contrast clauses control the truth-value we intuitively assign. If one accepts the data as semantic data (which I am assuming the binary theorist is accepting here: see The Contrastive Data section), then the adjunctions strategy is out from the start.

The second main problem with the adjunctions strategy is the problem of *closure*. That is, the adjunctions strategy does not allow the (a) and (b) cases enough of an opportunity to differ in truth-value, since it renders knowledge in the (b) cases just-a-trivial-closure-inference-away from knowledge in the (a) cases. This is very similar to the second problem for the conjunctions strategy. On the adjunctions strategy, *Rather* (a) becomes: the detective knows that (Mary rather than Peter stole the bicycle). Since (Mary rather than Peter stole the bicycle) entails (Mary stole the bicycle), the detective is just a trivial closure inference away from knowing that Mary stole the bicycle. And since (Mary stole the bicycle) plus the conversationally implicated premise that (Mary stole only one item) entails (Mary stole the bicycle rather than the wagon), the detective is now just a trivial closure inference away from knowing that (Mary stole the bicycle rather than the wagon)—which is what *Rather* (b) becomes on the adjunctions strategy.[14]

In summary, the adjunctions strategy cannot explain the contrast-sensitivity of knowledge ascriptions. The analysis it provides is neither linguistically plausible nor

intuitively fitting to how different the (a) and (b) cases are. The binary theorist should perhaps continue to look elsewhere. Yet I know of no further strategies for her to look towards.

The Contrast-sensitivity of Knowledge

I have argued that the binary theorist cannot provide a semantic explanation of the contrastive data. Or at least, I have argued that the three most plausible strategies (conditionals, conjunctions, and adjunctions) fail. Pending any further strategies for semantic explanation, this leaves the binary theorist with two remaining options: (i) reject the data, and (ii) explain away the data on pragmatic or error-theoretic grounds.

I have little to say about rejecting the data as per option (i), save that it strikes me as desperate. To my mind (and virtually all of my informants) the intuitions here are relatively clear. The binary theory is just getting the data wrong here.

I suspect that the binary theorist's best move at this point is to try to explain away the contrastive data on pragmatic or error-theoretic grounds, as per option (ii). But there are constraints on such a move. A successful pragmatic explanation must invoke antecedently established pragmatic mechanisms (such as the Gricean rules). A successful error-theoretic explanation must invoke antecedently attested cognitive failures (such as Kahneman and Tversky's heuristics and biases). I invite the binary theorist to provide the details. For now, I can only say that I have no inkling as to how such an explanation might run. So for now I must conclude that only the contrastivist has a viable explanation of the data.

Acknowledgements

Thanks to Martijn Blaauw, Walter Sinnott-Armstrong, and the participants at the NAMICONA Epistemic Contrastivism Conference. The discussion there provided the inspiration for this paper.

Notes

[1] The contrastive theory emerges in the following passage from Fred Dretske: "To know that *x* is *A* is to know that *x* is *A* within a framework of relevant alternatives, *B*, *C*, and *D*. This set of contrasts … serve to define what it is that is known …" (1970, 1022). The theory has since been defended by Bredo Johnsen (2001), Adam Morton and Annti Karjalainen (2003), Walter Sinnott-Armstrong (2004), Martijn Blaauw (2004), and Schaffer (2004, 2005, 2007). Thus Johnsen maintains that "what is known is always a contrastive proposition to the effect that P-rather-than-any-other-member-of-category-C is true …" (2001, 401). There are a variety of arguments for contrastivism, beyond the contrast-sensitivity of our intuitions. These include the conceptual role of knowledge ascriptions, and the connections between knowledge, inquiry, and discrimination. I will not be discussing these other arguments further here. See Schaffer (2005) for further discussion, and see Ram Neta (2008) for a very helpful summary.

[2] Thus see, for instance, the partition semantics for questions presented in James Higginbotham (1996), the contrastive theory of focus developed in Mats Rooth (1992), and the "set of live

options for the conversants" model of presupposition offered in Robert Stalnaker (1999a, 1999b).

[3] Dretske (1981) may have been the first to note the impact of contrast shifts on knowledge ascriptions: "Someone claiming to know that Clyde *sold* his typewriter to Alex is not (necessarily) claiming the same thing as one who claims to know that Clyde sold his typewriter *to Alex* … A person who knows that Clyde *sold* his typewriter to Alex must be able to rule out the possibility that he *gave* it to him, or that he *loaned* it to him … But he needs only a nominal justification, if he needs any justification at all, for thinking it was Alex to whom he sold it" (Dretske 1981, 373).

[4] I am indebted to Kent Bach, Michael Tooley, and René van Woudenberg for discussion on this point.

[5] Symbol key: I use "→" as a dummy connective for some conditional, and I reserve "⊃" for the material conditional, "⇒" for the indicative conditional, and ">" for the subjunctive conditional.

[6] See Sinnott-Armstrong (2002) for a related argument against construing contrastive claims as material conditionals.

[7] Here I remain neutral on what exactly is the indicative conditional, only supposing that (i) it differs from the material and subjunctive conditionals, and (ii) it validates certain intuitively valid inference patterns. The reader who would deny (i) is welcome to just apply the criticism of using material or subjunctive conditionals here. The reader who would deny (ii) is invited to clarify what inferential role he/she sees the indicative conditional as playing. See Dorothy Edgington (2001) for a useful overview of accounts of the indicative conditional.

[8] A version of the conjunctions strategy has been suggested by David-Hillel Ruben (1987) and Dennis Temple (1988), for reducing contrastive explanatory locutions. I am indebted to Jesper Kallestrup for further discussion here.

[9] That Mary stole only one item is presupposed by the contrastive locution of *Rather* (b). If Mary could have stolen both the bicycle and the wagon, then there would be no contrast between these options. This could all be made explicit by inserting "only", to read "Mary stole only the bicycle".

[10] An adjunct is a semantically optional element, as opposed to an argument, which is required to saturate a slot in the relation. For the contrastivist, the contrast is a required argument under K (it is the *q* slot in the K*spq* relation). On the adjunctions strategy, the contrast is an optional element in *p*. Contrast clauses (like any other clauses) can serve as either adjuncts or arguments, depending on the relation. The preference relation, for instance, is a three-place contrastive relation *Pspq*, so the contrast serves as an argument in:

Argument-Prefer
I prefer that the Red Sox win the World Series, rather than that the Cardinals win.

The kissing relation, on the other hand, is a two-place relation K*xy*, so the contrast serves as an adjunct in:

Adjunct-Kiss
Cindy kissed Billy rather than Tommy.

The adjunctions strategy then holds that the contrasts in knowledge ascriptions function as in *Adjunct-Kiss* rather than in *Argument-Prefer*.

[11] I am indebted to Thomas Blackson, Stephen Schiffer, and Daniel Howard-Snyder for discussion here.

[12] All of the examples here in which the contrast clause is an argument (*Prefer*, *Surprise*, *Regret*) allow for the contrast to be left implicit:

Implicit-Prefer
I prefer that the Red Sox win the World Series.

Implicit-Surprise
Ann was surprised that Cindy kissed Billy.

Implicit-Regret
I regret that Bush is president.

In the *Implicit* cases the contrast argument is to be recovered from context (from what is presupposed). The knowledge relation works the same way when the contrast is left implicit. This is the morale of *Presupposition (a)* and *Presupposition (b)* in The Contrastive Data section. The implicit contrasts for "the detective know that Mary stole the bicycle" are to be recovered from the question under discussion. (So is the contrastivist a contextualist? *Yes* and *no*: *yes* in that the truth-value of binary knowledge *that* ascriptions comes out *contextually sensitive*, but *no* in that "knows" *invariantly* denotes the one and only K relation. What shifts with context is only the value of the contrast, and only when that is left implicit.)

[13] The reader may confirm that the contrast clauses in the *Adjuncts* cases do not impact truth-values. For instance, if (i) Cindy kissed Billy, then (assuming only one kissing occurred) it follows that (ii) Cindy rather than Sally kissed Billy, (iii) Cindy kissed rather than chastely shook hands with Billy, and (iv) Cindy kissed Billy rather than Tommy. Indeed, assuming only one kissing occurred, (i)–(iv) are materially equivalent. To illustrate the point via focus: (v) *Cindy* kissed Billy, is materially equivalent to (vi) Cindy kissed *Billy*. Whereas (vii) Ann was surprised that *Cindy* kissed Billy, is not materially equivalent to (viii) Ann was surprised that Cindy kissed *Billy*.

[14] The problem of closure is clearest in the focus case: here the alleged closure inference runs from: (i) the detective knows that *Mary* stole the bicycle, to (ii) the detective knows that Mary stole *the bicycle*. How could these have any opportunity to differ in truth-value (save by the grossest of logical blunders), if the contrast-value was not playing the role of argument in the knowledge relation?

References

Blaauw, M. 2004. Contrastivism: Reconciling skeptical doubt with ordinary knowledge. Diss., Free University of Amsterdam.

Dretske, F. 1970. Epistemic operators. *The Journal of Philosophy* 67 (24): 1007–23.

———. 1981. The pragmatic dimension of knowledge. *Philosophical Studies* 40 (3): 363–78.

Edgington, D. 2001. Conditionals. In *Stanford Encyclopedia of Philosophy* [cited 14 September 2006]. Available from http://plato.stanford.edu/entries/conditionals/; INTERNET.

Higginbotham, J. 1996. The semantics of questions. In *The handbook of contemporary semantic theory,* edited by S. Lappin, pp. 361–83. Oxford: Basil Blackwell.

Johnsen, B. 2001. Contextualist swords, skeptical plowshares. *Philosophy and Phenomenological Research* 62 (2): 385–406.

Morton, A., and A. Karjalainen. 2003. Contrastive knowledge. *Philosophical Explorations* 6 (2): 74–89.

Neta, R. 2008. Undermining the case for contrastivism. *Social Epistemology* 22 (3): 289–304.

Rooth, M. 1992. A theory of focus interpretation. *Natural Language Semantics* 1 (1): 75–116.

Ruben, D.-H. 1987. Explaining contrastive facts. *Analysis* 47 (1): 35–7.

Schaffer, J. 2004. From contextualism to contrastivism. *Philosophical Studies* 119 (1–2): 73–103.

———. 2005. Contrastive knowledge. In *Oxford studies in epistemology* 1, edited by T. Gendler and J. Hawthorne, pp. 235–71. Oxford: Oxford University Press.

———. 2007. Knowing the answer. *Philosophy and Phenomenological Research* 75 (2): 383–403.

Sinnott-Armstrong, W. 2002. What's in a contrast class? *Analysis* 62 (1): 75–84.
———. 2004. *Pyrrhonian skepticism.* Oxford: Oxford University Press.
Stalnaker, R. 1999a. Assertion. In *Context and content,* pp. 78–95. Oxford: Oxford University Press.
———. 1999b. On the representation of context. In *Context and content,* pp. 96–113. Oxford: Oxford University Press.
Temple, D. 1998. The contrast theory of why-questions. *Philosophy of Science* 55 (1): 141–51.