Rigidification, Chance, and Credence

James R. Shaw [†]

Red and Blue are fair coins I will flip tomorrow. I will put Blue in my pocket if it lands tails, Red otherwise. Today I fix the referent of a name by description:[1] let "Flippy" name the coin that ends up in my pocket tomorrow.

What should my credence be in Flippy's landing heads? Here are two arguments, each adverting to the Principal Principle (PP) which, roughly, requires us to apportion our credence in line with known objective chance.[2]

Argument 1

1a	Flippy is Red or Flippy is Blue.	
1b	The objective chance of each of Red and Blue landing heads is $\frac{1}{2}$.	
1c	So the objective chance of Flippy landing heads is $\frac{1}{2}$.	(1a, 1b)
1d	So I should have credence $\frac{1}{2}$ in Flippy landing heads.	(1c, PP)

Argument 2

2a	Flippy lands heads iff Blue and Red both land heads.	
2b	The objective chance of Blue and Red both landing heads is $\frac{1}{4}$.	
2c	So I should have credence $\frac{1}{4}$ in Blue and Red both landing heads.	(2b, PP)
2d	So I should have credence $\frac{1}{4}$ in Flippy's landing heads.	(2a,2c)

[1] Kripke (1980).

[2] Lewis (1980, 1994), Hall (1994).

At least one of the arguments is fallacious. But their premises seem exceptionless, and if so some inference is to blame. But which?

1 Some Options

Here are salient options.

(A) Block the inference from (1a,b) to (1c).

(B) Block the inference to (1d) or (2c) on grounds that I possess inadmissible evidence.

(C) Block the inference to (1d) or (2c) by rejecting the Principal Principle.

(D) Block the inference from to (2a,c) to (2d).

In considering essentially this question, Hawthorne & Lasonen-Aarnio (2009) accept that credences should by swayed by reference stipulation (as Argument 2 would have it) blaming the Principal Principle (as per (C)), though without much by way of justification. The first thing I'd like to do is deepen the case for faulting the Principal Principle by ruling out some alternatives.

An important motivation for (A) is that by introducing "Flippy" I've landed myself in a Frege Puzzle (Flippy is Red or Blue, but I don't know which). Recently, Chalmers (2011) has stressed that Frege Puzzles raise questions about the objects of credence just as much as they do about the objects of belief. Indeed, I'm inclined to agree with the thrust of Braun (2016) that Frege Puzzles raise *exactly* the same questions in both domains, so that credal and doxastic Frege Puzzles call for parallel resolutions. Accordingly, just as some treat Frege Puzzles by refining the objects of belief to invalidate the substitution of coreferents in doxastic contexts, we can expect those theorists to likewise refine the objects of credence to invalidate the substitution of coreferents in credal contexts.[3]

But if we refine the objects of credence to cope with Frege Puzzles, maybe we'll do so for the *objects of chance* as well, likewise invalidating substitution of coreferring terms in chance reports.[4] And this could allow us to reject the inference in (A). It may be that

---

[3] Perhaps also relevant to this point is recent work noting that epistemic properties (like that of being a possible or probable winner of a lottery) may hold of objects, *de re*, only relative to something like a way of picking them out. See Ninan (2018), Rabern (forthcoming).

[4] It's worth noting that, e.g., Chalmers (2011, 630) does not take this route.

the chance of Red's landing heads is $\frac{1}{2}$ and the chance of Flippy's landing heads is $\frac{1}{4}$, even if Flippy *simply is* Red.

But whatever the merits of refinement as a technique for coping with Frege Puzzles, I can't see it having any bearing on this puzzle. To see why, consider some other routes to establishing (1c). Suppose tomorrow I hold Flippy (e.g., Blue) in my hand and show it to an interested passerby. I say "Here is a fair coin, named 'Flippy'." I might, but needn't, add that it got that name exclusively by being in my pocket at a certain time that day. I continue "Flippy was flipped earlier today. What was the chance, as of yesterday, that it would land heads in that flip?" Though this speaker knows nothing of my intentions to put coins in pockets at various times, they are by virtually any account a fully competent user of "Flippy". They also know everything about the coin named "Flippy" that is relevant to its past flip (e.g., its bias). So they should be positioned to answer my question. But they are not positioned to give any answer but $\frac{1}{2}$. Once we see this, it doesn't matter how refined we make the object of chance associated with "Flippy lands heads". Whatever those objects are, it seems truthful in all contexts post flipping and pocketing to say that Flippy had an objective chance of $\frac{1}{2}$ to land heads in retrospect. And, of course, we can see this ahead of time, so even pre-flip we should be in a position to know (1c).

In addition to bolstering (1c) by retrospection, we can do so by counterfactual supposition. As a matter of fact I *will* put Blue in my pocket if it lands tails, and so on. But suppose I had not introduced the name "Flippy" or adopted plans to put a coin in my pocket, but still flipped both Red and Blue. In such a scenario, what would the objective chance of Flippy landing heads have been? This question makes sense: "Flippy" is rigid, so Flippy is flipped in the counterfactual scenario. And the answer to the counterfactual question would have to be $\frac{1}{2}$ (what other option is there?). But if so, why should the objective chances be any different given how things actually are. Do the objective chances of a coin flip somehow change because I talked about it in different ways, or because I stuck the coin in my pocket *after* the flip?

Frege Puzzles reveal there are many different ways to think of a fair coin. But these ways of thinking of the coin don't detract from its being fair. And the fairness of a coin is the only thing that should matter to the *objective* chances of its landing heads or tails on a flip that hasn't yet taken place. Retrospection and counterfactual supposition are just confirming that intuitive thought.

These considerations against (A) present mounting evidence that chance reports

are generally not hyperintensional.[5] In passing, it is worth noting that we can create a simple variation on our puzzle using actualized descriptions—e.g. using "the coin that actually ends up in my pocket" in place of "Flippy". If the actualized descriptions can be substituted for codesignative names in chance reports (as the mounting evidence suggests), we will want a solution to our puzzle that generalizes to variants involving such descriptions as well. We should bear this in mind as we proceed.

(B) seeks to exploit a familiar caveat in applications of the Principal Principle. That principle generally requires rational credence to defer to known objective chance. But sometimes agents may be in possession of special kinds of information that would override the deferral—for example, information from reliable fortune tellers or time-travelers. In his earliest formulations of the Principal Principle, Lewis labelled this kind of evidence "inadmissible" and took the Principal Principle to apply only in cases where an agent was not in possession of it.[6]

It seems plausible that before introducing "Flippy" I needn't be in possession of inadmissible evidence. Can the reference stipulation be to blame? Well, post stipulation I arguably know something I didn't before: that Flippy lands heads just in case both Blue and Red land heads. That is information I didn't have because I was not in a position to think any thoughts about Flippy (*qua* Flippy) before introducing the name. And the information is about the future, inasmuch as it is about the relationships between future coin tosses.

But although this is new information about the future, I fail to see why having it should count as anything like bearing witness to the projections of a crystal ball or receiving missives from the future. The main problem is that the information we gain by introducing a name is broadly *definitional*. Granted, the definition is special in ways that Kripke brought out. It rigidly fixes a referent for a name rather than introducing a pure semantic equivalent for it, and the resulting equivalence is to that extent contingent. But so what? Is a window into future reality so cheaply bought that anyone can get it by stipulating new names willy nilly? Traditional examples of inadmissible evi-

---

[5] Cf. WILLIAMSON (2006, 317). There is good reason, however, to think chance reports are not extensional, as noted in SALMON (2019, 650). In that context, Salmon also argues that some metaphysically impossible outcomes have a positive objective chance of obtaining, which would entail that chance is modally intensional. I sadly do not have the space to consider his arguments here.

[6] The role of an admissibility conditions in formulations of the principle is more complex than I make it out here and, to some extent, controversial. But we needn't enter into the details here. We are only exploring the idea that possession of a reference-fixing description plays a role *like* that of crystal ball, and that this may *somehow* contribute to a resolution of the above puzzle.

dence require things like mind-bending causal effects of the future on the past. There are plain and striking contrasts between this kind of information and that supplied by humdrum acts of reference fixing. Perhaps some story can be told to make those differences appear less stark, but I am dubious.

Even if these more informal concerns aren't decisive, the strategy of inadmissibility seems unworkable when we consider the variant puzzles using actualized descriptions. Since the range of such descriptions is antecedently present in a speaker's idiolect, and requires no new stipulation, what appears to give me inadmissible evidence in this case is something like my reliable intention to put a coin in my pocket (which ensures an actualized description acquires a referent). In fact, the mere presence of the actuality operator threatens to make inadmissible evidence about every chancy event unavoidable (since we always have decisive evidence for a claim like "the actual outcome of process P is the outcome of process P"). If so, we can rescue the truth of the Principal Principle by appeal to inadmissibility only at the cost of making it unusable in any case by an agent with the conceptual sophistication to express actualization.[7]

I will say little about (D). If we know that Flippy lands heads just in case Blue and Red both land heads, we should clearly assign equal credence to both outcomes. Some general principles (e.g., Probabilism) require this. But I would put less stock in such general principles, which may admit of outlandish exceptions,[8] than I would in a judgement about this particular case. (D) can be rejected on intuitive merits alone.

We seem to be left with only one option: denying the Principal Principle in its received form. If we can't adopt (A) or (B), the Principal Principle allows us to reach the conclusion of Argument 1. If we can't adopt (B) or (D), it will also allow us to reach the conclusion of Argument 2.

As a practical matter, this outcome would hardly be devastating. Obviously we can try to salvage the principle by qualifying it further. For example, saying that credence should line up with known chance unless we gain unusual information about future

---

[7] MEACHAM (2010) offers a definition of admissibility which, paired both with certain theories of content (e.g., a Russellian one) and the assumption that "Flippy" contributes to the expression such content, may entail that the definitional equivalence constitutes inadmissible evidence. But this definition also entails, in this context, that (e.g.) various Tarski-biconditionals are inadmissible as well. E.g., the Russellian proposition expressed by ""Flippy lands heads" is true iff Flippy lands heads" will be inadmissible for similar reasons. It strikes me as implausible that such apparently trivial biconditionals are *both* inadmissible *and* evidence possessed by competent users of "Flippy". This doesn't mean we need to give up Meacham's characterization (or the relevant views of content) though: see n.16.

[8] E.g., if CAIE (2013) is right.

events *or* we are considering certain facts stated using descriptive names (or actualized descriptions).[9] We can probably get by with an amended principle if we have to. But for the reasons just stressed in discussing point (B), we should acknowledge the resulting principle *is* amended: the connections between chance and rational credence would now be twice qualified.

2   Rigidification and Propositional Grasp

Still, it would be nice to have some explanation of *why* fixing reference by description (or why the mere existence of an actuality operator) distorts the rational regulative role of known chance the way it is broadly clear, for example, why evidence from crystal balls and time travelers has that effect. I am not sure what shape that explanation should take.

Fortunately, we haven't actually exhausted all options. I would prefer to keep intuitive judgments about chance and the Principal Principle in place. Instead, I like to think Flippy teaches us a lesson in the philosophy of language which several theorists are drawn to on independent grounds.

For me to confront any question about what credence to hold in Flippy's landing heads, two things must hold. First, "Flippy" must make contributions to the expression of propositional content. Second, as the stipulator of "Flippy", I must be able to exploit knowledge of those contributions to entertain the propositional content in question. The first condition is required for there to be any question about chances of, or credences in, a proposition that Flippy lands heads. The second condition is required for me to have views on that proposition, when I reflect on how things stand with the coin I've named.

My inclination is to deny the second condition. Indeed, I am tempted deny this claim for a much wider class of names than those descriptively introduced in circumstances like those of "Flippy".[10]

---

[9] In a footnote, SPENCER (forthcoming, 123,n.20) suggests coping with the puzzle by combining appeals to Guise Theory, inadmissibility, and revisions of the Principal Principle. Notably, applications of the Principal Principle on this proposal are restricted to cases where we have certain admissible evidence about guises. Since this introduces de facto restrictions on the Principal Principle to avoid its application to certain descriptive names (and perhaps actualized descriptions), I see his position as broadly compatible with the dialectic so far. I do have some concerns about whether Spencer can coherently maintain that the information about guises that restricts his application of the Principal Principle are not part of the stipulator's evidence, as he maintains, but discussing why would take us too far afield.

[10] SHAW (2021/ms.a), SHAW (2021/ms.b).

It is of course possible to deny the second claim *by* denying the first. One could do this (say) by insisting that something prevents "Flippy" from referring, at least at the time it is introduced. After all, what coin "Flippy" names is a chancy matter, which may mean there is no fact as to which coin "Flippy" names. And perhaps *that* means the name is not yet meaningful enough to contribute to the expression of propositional content.

I shy away from denying the first condition on these grounds for several reasons—let me mention two. First, I am not sure there need be no fact of the matter as to which coin Flippy is. For all I know chancy events may be deterministic,[11] so that the outcome of my future flips is in some sense already settled. Second, the parallel solution to puzzles using actualized descriptions, which denies those descriptions contribute to the expression of content, is quite radical. For example, this would typically require that some constituent of the description cannot contribute to the expression of propositional content—but which?

So I instead lean toward the view that fixing a name's referent by description needn't position one to think the propositions that name would help express. Historically, such views arose in response to a perceived tension between unconstrained theories of direct reference and intuitive views of object-involving thought—sometimes called "*de re*" or "singular" thought.[12]

In the wake of work on reference spearheaded by authors like Kripke and Kaplan, it was noted that the idea that we can unrestrictedly fix something like 'direct' reference by means of description led to a tension. One the one hand, it was felt that being positioned to have a singular thought about an object required standing in a privileged cognitive relationship to it.

SINGULAR NON-TRIVIALITY

Having singular thought about an object involves some non-trivial cognitive relationship to it.

---

[11] E.g.: CLARK (1987), LOEWER (2001), HOEFER (2005), ISMAEL (2009), GLYNN (2010), SOBER (2010), EAGLE (2011), STREVENS (2011), and GALLOW (forthcoming). Notably, some proponents of deterministic chance still advocate for a version of the Principal Principle (usually with adjustments as to what counts as admissible evidence).

[12] Both labels can be misleading: the former being used to mark orthogonal semantic or syntactic distinctions and the latter often being wedded to controversial Russellian conceptions of propositional content. For better or worse, I'll stick with talk of 'singularity' for now.

On the other hand, the mechanism of reference-fixing by description appeared to trivialize possession of singular thought.

Semantic Instrumentalism[13]

    (a) It's a trivial matter to fix the meaning of a directly referring name by an arbitrary description that simply happens to pick out an object, and

    (b) thereby be able to think propositions semantically expressed by sentences containing such a name,

    (c) which are singular propositions about that object.

A few philosophers embraced Semantic Instrumentalism early on.[14] But the view now tends to stand in disrepute, with authors primarily divided on how best to reject it.[15]

What is interesting is that some philosophers who reject Instrumentalism by rejecting (b) may also be in a position to resolve the puzzle about Flippy without denying premises, the Principal Principle, or any other intuitive principle about credence or chance. What such philosophers may instead challenge is the idea that I, by being the stipulator of reference for "Flippy", am thereby able to think the propositions it helps to express. On this view, *both* Arguments 1 and 2 are fallacious.

For example, on this view (1a)–(1c) all express truths, and as the stipulator of "Flippy" I know this. But I do not thereby know the truths expressed themselves (in particular those expressed by (1a) or (1c)). Merely knowing that (1c) expresses a truth has no bearing on applications of the Principal Principle. That principle only constrains my credences *in a proposition* that I know to have a certain objective chance. But to know (1c) expresses a truth is not to know of any particular proposition that it has an objective chance. Likewise, although (2a)–(2c) express truths, and I know this, I do not thereby know all the truths expressed (in particular, that expressed by (2a)), and (2d) needn't follow.

---

[13] The terminology owes to Jeshion (2010).

[14] Harman (1977) and Kaplan (1989b).

[15] Rejecters of (a) include (as I understand them): Soames (2003), Jeshion (2010), Dickie (2015). Rejecters of (b): Donnellan (1977), Salmon (1987), Kaplan (1989a). Rejecters of (c) are harder to come by. There are of course philosophers who continue to be open to a broadly instrumentalist line. See, for example, Hawthorne & Manley (2012) for a more recent view on which we should keep conditions on singular thought quite weak.

The situation might be (very roughly) likened to this one: suppose you receive testimony from a perfectly reliable speaker, but in language you don't know. For example, they assert: "Va a llover mañana." You now know this sentence of Spanish expresses a truth. How should learning this affect your credence in what this sentence reports: that it will rain tomorrow? As long as you have no views on what proposition is expressed by the Spanish sentence, it should not affect your first-order credences about rain at all. Your semantically ascended views about the expression of truths will not impinge on your first-order views by 'direct' semantic descent. Similarly, in Arguments 1 and 2, if I do not yet know what propositions are expressed by sentences like (1a), (1c), or (2a), then even if I know they express truths, my first order views on the propositions expressed may go unaffected. Also principles that would engage with such first-order views (like the Principal Principle) may fail to trigger.[16]

Note that there are metalingusitic analogs of key claims from Arguments 1 and 2 that are preserved. I know that "Flippy lands heads" expresses a proposition that obtains with objective chance $\frac{1}{2}$. And I have a rationally lower credence in "Flippy lands heads" expressing a truth than I do in its negation expressing a truth. But the former knowledge and the latter credence are fully compatible as long as I know that although "Flippy" names a fair coin, it is more likely to name one that lands tails.

Such metalinguistic knowledge may explain the intuitive appeal of each argument, to the extent it is felt. For example, one may be drawn to Argument 2 by noting that given even odds on a *bet* on whether Flippy lands tails, I should of course take them. But we can explain that without requiring you to have any particular credence in the proposition expressed by "Flippy lands tails". If you understand a Spanish-speaking bookie well enough to know they are offering bets on whether 'va a llover mañana', you can have strong reasons to take their bet even if you have no idea what they are talking about.

Though theorists who lean on the denial of (b) are poised to resolve the puzzle neatly, it is worth noting their views may be radicalized by the variant puzzle using actualized descriptions. For theorists can only avoid that variant puzzle using the same

---

[16] The view can also pair with plausible conceptions of admissibility like that of MEACHAM (2010). As noted in n.7, Meacham's characterization can, in conjunction with reasonable views of propositional content, entail that the definitional equivalence for "Flippy" constitutes inadmissible evidence. This is compatible with the view on offer. It's just that problems don't arise because the stipulator *possesses* this inadmissible evidence. Rather, problems arise because they aren't in possession of it. In this case, the inadmissibility of the evidence is precisely what makes it hard to possess, just as one would expect.

strategy if (as is less common, and so more striking) they also deny thinkers the ability to grasp certain propositions expressed using actualized descriptions—at least in cases like those of Flippy. And they must even forgo using such actualized descriptions to furnish ersatz thoughts to entertain when 'direct' thoughts about the referent of a descriptive name like "Flippy" are epistemically unavailable.[17]

   I'm inclined to take this route. I think other considerations from the philosophy of language speak in its favor, even independently of concerns about Semantic Instrumentalism.[18] What is interesting about Flippy is that it may show that some limited pressure for this controversial view can be marshaled from the theory of probability.

References

Braun, David. 2016. "The Objects of Belief and Credence." *Mind*, vol. 125 (498): 469–497. [2]

Caie, Michael. 2013. "Rational Probabilistic Incoherence." *Philosophical Review*, vol. 122 (4): 527–575. [5]

Chalmers, David J. 2011. "Frege's Puzzle and the Objects of Credence." *Mind*, vol. 120 (479): 587–635. [2]

Clark, Peter. 1987. "Determinism and Probability in Physics." *Proceedings of the Aristotelian Society*, vol. 61: 185–210. [7]

Dickie, Imogen. 2015. *Fixing Reference*. Oxford University Press. [8]

Donnellan, Keith S. 1977. "The Contingent a Priori and Rigid Designators." *Midwest Studies in Philosophy*, vol. 2 (1): 12–27. [8]

Eagle, Antony. 2011. "Deterministic Chance." *Noûs*, vol. 45 (2): 269–299. [7]

Gallow, J. Dmitri. forthcoming. "A Subjectivist's Guide to Deterministic Chance." *Synthese*. [7]

Glynn, Luke. 2010. "Deterministic Chance." *British Journal for the Philosophy of Science*, vol. 61 (1): 51–80. [7]

Hall, Ned. 1994. "Correcting the Guide to Objective Chance." *Mind*, vol. 103 (412): 505–518. [1]

Harman, Gilbert. 1977. "How to Use Propositions." *American Philosophical Quarterly*, vol. 14 (2): 173–176. [8]

---

[17] For theorists countenancing the idea that thought through descriptive names like "Flippy" makes use of rigidified descriptive content see Recanati (1993), Reimer (2004), Soames (2003).

[18] Shaw (2021/ms.a), Shaw (2021/ms.b).

Hawthorne, John & Maria Lasonen-Aarnio. 2009. "Knowledge and Objective Chance." In *Williamson on Knowledge*, Patrick Greenough & Duncan Pritchard, editors, 92–108. Oxford University Press. [1], [2]

Hawthorne, John & David Manley. 2012. *The Reference Book*. Oxford University Press. [8]

Hoefer, Carl. 2005. "The Third Way on Objective Probability: A Sceptic's Guide to Objective Chance." *Mind*, vol. 116 (463): 549–596. [7]

Ismael, J. T. 2009. "Probability in Deterministic Physics." *Journal of Philosophy*, vol. 106 (2): 89–108. [7]

Jeshion, Robin. 2010. "Singular Thought: Acquaintance, Semantic Instrumentalism, and Cognitivism." In *New Essays on Singular Thought*, Robin Jeshion, editor, 105–141. Oxford University Press. [8]

Kaplan, David. 1989a. "Afterthoughts." In *Themes From Kaplan*, J. Almog, J. Perry & H. Wettstein, editors, 565–614. Oxford University Press. [8]

—. 1989b. "Demonstratives." In *Themes From Kaplan*, Joseph Almog, John Perry & Howard Wettstein, editors, 481–563. Oxford University Press. [8]

Kripke, Saul A. 1980. *Naming and Necessity*. Harvard University Press. [1]

Lando, Tamar. 2019/ms. "The Content of Indexical Belief." [1]

Lewis, David K. 1980. "A Subjectivist's Guide to Objective Chance." In *Studies in Inductive Logic and Probability, Volume II*, Richard C. Jeffrey, editor, 263–293. Berkeley: University of California Press. [1]

—. 1994. "Humean Supervenience Debugged." *Mind*, vol. 103 (412): 473–490. [1]

Loewer, Barry. 2001. "Determinism and Chance." *Studies in History and Philosophy of Science Part B: Studies in History and Philosophy of Modern Physics*, vol. 32 (4): 609–620. [7]

Meacham, Christopher J. G. 2010. "Two Mistakes Regarding the Principal Principle." *British Journal for the Philosophy of Science*, vol. 61 (2): 407–431. [5], [9]

Ninan, Dilip. 2018. "Quantification and Epistemic Modality." *Philosophical Review*, vol. 127 (4): 433–485. [2]

Rabern, Brian. forthcoming. "Binding Bound Variables in Epistemic Contexts." *Inquiry: An Interdisciplinary Journal of Philosophy*, 1–31. doi:10.1080/0020174x.2018.1470568. [2]

Recanati, François. 1993. *Direct Reference: From Language to Thought*. Blackwell. [10]

Reimer, Marga. 2004. "Descriptively Introduced Names." In *Descriptions and Beyond*, Marga Reimer & Anne Bezuidenhout, editors, 613–629. Oxford University Press. [10]

Salmon, Nathan. 1987. "How to Measure the Standard Metre." *Proceedings of the Aristotelian Society*, vol. 88: 193–217. [8]

—. 2019. "Impossible Odds." *Philosophy and Phenomenological Research*, vol. 99 (3): 644–662. doi:10.1111/phpr.12517. [4]

Shaw, James R. 2021/ms.a. "Kripkean Necessity A Posteriori: Some Doubts." [6], [10]

—. 2021/ms.b. "Naming and Knowledge of Meaning." [6], [10]

Soames, Scott. 2003. *Philosophical Analysis in the Twentieth Century Vol. 2: The Age of Meaning.* Princeton University Press. [8], [10]

Sober, Elliott. 2010. "Evolutionary Theory and the Reality of Macro Probabilities." In *The Place of Probability in Science*, Ellery Eells & James H. Fetzer, editors, 133–60. Springer. [7]

Spencer, Jack. forthcoming. "No Crystal Balls." *Noûs*. [6]

Strevens, Michael. 2011. "Probability Out Of Determinism." In *Probabilities in Physics*, Claus Beisbart & Stephan Hartmann, editors, 339–364. Oxford University Press. [7]

Titelbaum, Michael G. 2012. "An Embarrassment for Double-Halfers." *Thought: A Journal of Philosophy*, vol. 1 (2): 146–151. [1]

Williamson, Timothy. 2006. "Indicative *versus* Subjunctive Conditionals, Congruential *versus* Non-Hyperintensional Contexts." *Philosophical Issues*, vol. 16 (1): 310–333. doi: 10.1111/j.1533-6077.2006.00116.x. [4]