

## A superlinguistics of hyperlink ‘pointing’<sup>1</sup>

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**Abstract.** We present a ‘superlinguistic’ analysis of hyperlinks, building on parallels with co-speech pointing gestures. We show that one is able to give acceptability judgments for hyperlink placement and use, allowing us to define a precise syntax and semantics of hyperlinks. We show that these patterns interact with core linguistic systems, including constituent structure, semantic type, veridicality, and information structure.

**Keywords:** hyperlinks, pointing, co-speech gesture, computer mediated communication, superlinguistics.

### 1. Introduction

Human communication is not only restricted to words and sentences. Rather, human communication is a multimodal signal, incorporating elements such as iconic gestures, pointing, facial expressions, etc. On the other hand, recent work has made clear that these seemingly extralinguistic components of meaning nevertheless are subject to and interact with core linguistic systems, and can be modeled using the tools developed for formal linguistics (Lascarides and Stone, 2009; Ebert et al., 2011; Schlenker, 2018; Esipova, 2019; Schlenker, 2019).

Another richly multimodal domain of communication is that of computer mediated communication and online text, which can be supplemented with images, links, formatting, and other medium specific items (Herring, 1996; DeRose, 1989; McCulloch, 2019). In this paper, we will focus on the case of hyperlinks, and argue that hyperlinks show an intuitive parallel with pointing gestures. In both cases, a signal co-occurring with a linguistic string (an extended finger or underlined blue text), directs the addressee towards an object that is relevant to the linguistic utterance.

We will pursue the analogy between hyperlinks and pointing gestures, and show that it is possible to define a precise syntax and semantics for hyperlinks. We provide a preliminary taxonomy of hyperlinks with parallels to pointing gestures, and show that the discourse function or rhetorical relation of a link depends on the semantic type of linked string, and on the veridicality of the embedding environment. We will further show that different placements of a link within a sentence lead to different expectations for where the link will lead. We provide an analysis for these facts by building on theories of focus in natural language, in which the hyperlinked constituent establishes a question under discussion by evoking a set of propositional alternatives.

Methodologically, the present talk will be based primarily on intuitive judgments of the two co-authors. This being said, there are obvious methodological possibilities, as online text can easily and automatically be collected in large quantities.

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<sup>1</sup>The research leading to these results received funding from ERC H2020 Grant Agreement No. 788077–Orisem (PI: P. Schlenker). Research was conducted at the Département d’Etudes Cognitives (ENS), which is supported by Grants ANR-10-IDEX-0001-02 PSL and ANR-17-EURE-0017 FrontCog.

## 2. Hyperlink syntax

Syntax, broadly construed, concerns the well-formedness of a string, independent of context. This definition allows us to describe a hyperlink syntax. Intuitively, (2b) has a badly placed link, yielding a contrast in (2) analogous to the contrast in (1).

- (1) a. It was the first draft that Jefferson wrote that didn't include the words 'self-evident.'  
b. \*It was the first draft that Jefferson that wrote didn't include the words 'self-evident.'
- (2) a. [The first draft that Jefferson wrote](#) didn't include the words 'self-evident.'  
b. \*[The first draft that Jefferson](#) wrote didn't include the words 'self-evident.'

As illustrated in the contrasts in (1) and (2), hyperlink placement is constrained by constituent structure. In (1a) and (2a), *The first draft that Jefferson wrote* is a syntactic constituent, consisting of all the terminal descendants of a single syntactic node; in (1b) and (2b), *The first draft that Jefferson* is not a constituent, leading to the ungrammaticality of clefting in (1), and of hyperlinking in (2).

On the other hand, it turns out that hyperlink placement is freer than 'base constituency.' For example, the hyperlink placement in (3) is perfectly grammatical, but the string falsely told reporters is not a base-generated constituent, since the adverb *falsely* syntactically selects for a fully saturated VP. In naturally occurring examples, similar cases appear frequently; some examples from *New York Times* Opinion Editorials are provided in (4).

- (3) The candidate [falsely told reporters](#) that his opponent was in Russia.
- (4) a. His Virginia winery [just got around to firing](#) some longtime employees this week.  
b. Joe Biden, for instance, is 77 and currently demonstrating his youthful worldview by [driving around in a bus](#) called "No Malarkey."  
c. Acting Chief of Staff Mick Mulvaney is [on a mission](#) to destroy the Consumer Financial Protection Bureau.

Descriptively, the syntactic constraints relevant for hyperlink placement correspond to those relevant for coordination, which is known to show 'right-node raising' effects (Postal, 1974). Notably, just as *falsely told reporters* can serve as the placement of a hyperlink in (3), it can also be a conjunct in a coordination structure, as in (5). Coordination, as a constituency test, is thus more liberal than other constituency tests like clefting or proform substitution.

- (5) The candidate falsely told reporters and misleadingly implied to the Senate that his opponent was in Russia.

Non-constituent coordination has been analyzed as involving function composition or movement of a subconstituent to the right. Whichever theory is adopted for coordination can in principle also provide an analysis of hyperlink placement.

For concreteness, we can sketch an analysis using function composition within Categorical Grammar (Steedman, 1985). In (3), *falsely* is of syntactic category VP/VP and semantic type  $\langle et, et \rangle$ ; *told reporters* selects for a sentential argument—it is of category VP/S and of semantic type  $\langle t, et \rangle$ . Function composition combines the two to produce a unit of category VP/S and of semantic type  $\langle t, et \rangle$ , which can be hyperlinked or be coordinated with a constituent of the same category. For present purposes, an analysis like this in terms of function composition

has the slight advantage of being directly compositional in the sense of Barker and Jacobson (2007): every expression computed in the syntax has a semantic denotation. This will ensure that our later discussion is well-defined when we speak of the semantic type of hyperlinked constituents. Direct compositionality ensures that non-base constituents *have* a semantic type.

### 3. Hyperlink semantics

Semantics, broadly construed, concerns the contexts in which a string can be felicitously used. For hyperlinks, the relevant context relates to the destination URL, observable in inferences regarding where a link will lead. Just as (6) is infelicitous if John never smoked, (7) is infelicitous if the link leads to an article celebrating the incorruptibility of American politics. This conceptualization of meaning coincides with that of Ebert and Ebert (2014) and Schlenker (2018), who observe that gestures generate inferences about their context of use. For example, the utterance in (8) is infelicitous if John did not lift his daughter.

- (6) John stopped smoking.  
*Inference:* John used to smoke.
- (7) Hackers [helped Trump's election campaign](#).  
*Destination:* Evidence about how hackers manipulated online news.  
*Inference:* Hackers helped the campaign by manipulating online news.
- (8) John [helped]<sub>LIFTING GESTURE</sub> his daughter.  
*Inference:* John helped his daughter by lifting her.

Like presuppositions such as in (8), the inferences generated by hyperlinks and gestures are not part of the assertive meaning of an utterance. If the relevant inference is not met, the utterances in (6)–(8) are not false, they are deviant. As for other non-assertive meanings, this meaning may project. Schlenker (2018) shows that co-speech gesture systematically yields ‘cosuppositional’ inferences (i.e., conditionalized presuppositions), as in (9). Exactly analogous projective behavior can be found for hyperlinks; in (10), the speaker may be in doubt about whether the hackers’ behavior ultimately benefited the Trump campaign, but a conditional inference remains: if hackers helped Trump, it was by manipulating online news (and not, for example, by doing door-to-door canvassing)

- (9) Did John [help]<sub>LIFTING GESTURE</sub> his daughter?  
*Inference:* If John helped his daughter, it was by lifting her.
- (10) Did hackers [help Trump's election campaign](#)?  
*Destination:* Evidence about how hackers manipulated online news.  
*Inference:* If hackers helped Trump's campaign, it was by manipulating online news.

This being said, let us flag now that the embeddability of a hyperlink—and thus, its projective properties—will depend in part on the rhetorical relation performed by the hyperlink. In the example in (10), the linked destination serves to elaborate on what it means to help Trump, just as the gesture in (9) serves to elaborate what it means to help John's daughter. We will see other examples later in which it is deviant to embed hyperlinks in non-veridical environments. But in general, when hyperlinks are embeddable, their non-assertive meaning projects.

On the other hand, Ebert and Ebert (2014) and Ebert et al. (2020) observe that demonstratives

like *this*, *that*, and *like so* bring extra-linguistic content into the assertive dimension of meaning. In (11), if the bottle is not of the indicated size, the sentence is simply false. Exactly parallel facts hold for hyperlinks. In (12), if the linked tweet was posted on Tuesday, the sentence is false, not infelicitous.

(11) My water bottle is [this big]<sub>SIZE GESTURE</sub>.

(12) The senator posted [this tweet](#) on Monday.

*Destination:* A tweet by the senator.

We have yet to describe precisely how the meaning of a hyperlink is determined, but these examples establish several points. First, that it is possible to describe a ‘semantics’ of hyperlinks based on the contexts in which they can be used. Second, that the meaning of a hyperlink shares core properties with the meaning of co-speech gesture: they are by default non-assertive, they may give rise to cosuppositions, and they can be brought into the assertive dimensions by demonstratives.

#### 4. A taxonomy of hyperlink functions

Asher and Lascarides (2003) argue that propositions in a discourse can be related to each other by means of a variety of *rhetorical relations*. For example, in (13a), the second sentence can be naturally read as an explanation for the event described in the first sentence (a rhetorical relation called Explanation). In (13b), the most natural rhetorical relation is one that expresses a sequence of events (a rhetorical relation called Narration).

- (13) a. Jill punched the wall in frustration. She missed the deadline by one minute.  
b. Jill worked on the grant proposal all afternoon. She missed the deadline by one minute.

Lascarides and Stone (2009) extend the notion of rhetorical relations to co-speech gestures, arguing that gestures, too, may serve different discourse functions in relation to the speech that they accompany. For example, earlier, we saw what was arguably a case of Elaboration, elaborating through iconic depiction what it means for John to help his daughter in this context.

Here, we provide an initial taxonomy of hyperlink functions, showing that a similar range of rhetorical relations are instantiated between sentences carrying hyperlinks and the destinations they lead to. At a first pass, we divide hyperlinks into three types of relations: Identity, Definition, and Evidence. We construct similar examples using pointing gestures, supporting the hypothesis that the two kinds of phenomena draw on shared resources.

##### 4.1. Identity

In cases of Identity, the destination of the link is identical to the discourse referent introduced by the hyperlinked text. In (14), the hyperlinked string is a DP whose denotation is a particular tweet. The hyperlink is felicitous if the tweet at the destination URL is the tweet being referred to by the sentence. Example (15) provides an analogous example with gestural pointing; the gesture is felicitous if the individual identified by pointing is the guy behind the bar.

- (14) By Monday, [the senator’s tweet](#) had been seen by millions.

*Destination:* the tweet in question

(15) [The guy behind the bar]<sub>POINT AT MAN</sub> went to college with me.

In (14), the denotation of the hyperlinked DP is a definite description of type *e*, but the Identity relation may apply to any DP that introduces a discourse referent. In (16), for example, the indefinite *a recent PNAS paper* is a generalized quantifier of type  $\langle et, t \rangle$  but introduces a discourse referent of type *e*. The hyperlink is felicitous if the destination of the link is the discourse referent introduced by the DP.

(16) Similar results were reported in [a recent PNAS paper](#).  
*Destination*: the paper in question

On the other hand, anti-veridical contexts like negation block the introduction of discourse referents, so consequently also make the Identity relation unavailable for hyperlinks. In (17), for example, a single tweet appears below negation, so no discourse referent is introduced. As a consequence, there is no tweet that could be linked to in order to instantiate Identity. (On the other hand, the hyperlink could in principle be used under a different rhetorical relation, such as Evidence, described momentarily.)

(17) The senator hasn't posted [a single tweet](#) since her communication director changed.

#### 4.2. Definition

In cases of Definition, the destination provides a definition or examples of the hyperlinked text, as in (18) and (19). (This use of hyperlinks is highly prominent on Wikipedia, but can also be found elsewhere.) In (18), a Wikipedia page defines what the term *superdelegate* means; in (19), a set of images exemplify what is meant by *otterhound dog*. This rhetorical relation shares some intuitive properties with Identity (both identify what is being talked about), but Definition can be distinguished in many cases by the non-specificity of the destination. In (18), the DP *at least one superdelegate* introduces a discourse referent—namely, the individual who pledged their support—, but the destination may make no reference to this specific individual; it pertains to superdelegates in general.

- (18) a. At least one [superdelegate](#) has already pledged support for a candidate.  
*Destination*: Wikipedia page for 'superdelegate'  
b. The mayor is particularly fond of [otterhound dogs](#).  
*Destination*: Google image search showing pictures of the breed

Again, parallel examples can be found for pointing gestures. For example, somebody visiting a friend's apartment might utter the sentence in (19). Here, the rhetorical relation is not Identity, as the speaker is not pointing to the plant that they have in their own apartment. Rather, the pointing gesture instantiates Definition, indicating what is meant by *spider plant*.

(19) I have a [spider plant]<sub>POINT AT PLANT</sub> in my apartment as well.

A number of pragmatic factors influence the choice of rhetorical relation between a hyperlink and its destination. For Definition, one clear factor is the familiarity of the hyperlinked term: uncommon terms are more likely to be defined than common terms. Sentence (20) illustrates this with a minimal variant of (18a). Since the term *mayor* is unlikely to need definition, the hyperlink in (20) is more likely to lead to a destination identifying the specific mayor who

pledged support for a candidate.

(20) At least one [mayor](#) has already pledged support for a candidate.

#### 4.3. Evidence

Finally, in cases of Evidence, the destination provides evidence for the proposition containing the hyperlinked text, as in (21). Here, the links are not identifying any particular discourse referent; nor are they defining the meaning of an expression. Rather, the linked destinations provide evidence in favor of the claim made by the sentence.

- (21) a. Scott Pruitt tried to use his influence to [get his wife a Chick-fil-A franchise](#).  
*Destination:* article exposing Scott Pruitt's corruption.
- b. Apparently, at least one bird [was also unsatisfied](#) with the mayor's performance.  
*Destination:* video of a bird repeatedly dive-bombing the mayor's speech.

Gestures, too, can perform a similar role. In (22), the gesture provides evidence in favor of the claim made by the sentence.

(22) Apparently, the pigeons are also [not fans]<sub>POINT AT BIRDPPOOP</sub> of the new statue.

We observe that this rhetorical relation, like Identity, depends on the veridicality of the embedding context: you cannot provide evidence for a proposition that is not true. Thus, in (23), the linked destination may provide evidence about the matrix sentence (that is, Ben Carson's belief), but cannot provide evidence that the pyramids were indeed built to store grain, since this would contradict the asserted sentence.

(23) Ben Carson incorrectly believes that the pyramids were [built to store grain](#).

Other rhetorical relations may not have this constraint. For example, discussing emoji, Grosz et al. (2020) observe that Explanation is factive but Elaboration is not. So Elaboration can modify a non-veridical constituent (as we saw earlier for gesture and hyperlinks) but Explanation cannot.

#### 4.4. The role of semantic type

For co-speech gesture, Esipova (2019) observes that the semantic type of the accompanying speech places one constraint on what semantic composition is possible. Specifically, iconic gestures may be used to depict noun meanings, as in (24). Esipova argues that there may be ambiguity, however, regarding whether this gesture is modifying an NP meaning, of type  $\langle e, t \rangle$ , or a DP meaning, of type  $e$ . For example, in (24), the size gesture may either modify *dog*, analogous to (25a), or *her dog*, analogous to (25b). Esipova argues that, just like the examples in (25), gestural modifiers may only have a restrictive, at-issue interpretation when they modify NP meanings. Esipova proposes that the ambiguity of attachment explains patterns of projection seen for iconic gestures, which may be at-issue or presupposed.

(24) Stephanie might bring her [dog]<sub>SIZE GESTURE</sub>.

- (25) a. Stephanie might bring her big dog.  
b. Stephanie might bring her dog, a big animal.

In our taxonomy, similar considerations constrain the rhetorical relation performed by a hyperlink: Identity must relate the destination to an individual (type  $e$ ); Definition, to a unary predicate (type  $\langle e, t \rangle$ ); Explanation, to a proposition (type  $t$ ). In the following section, we will argue that there is a formal link between the text which is hyperlinked and the semantic object involved in the rhetorical relation. Notably, the hyperlinked text must be a substring of the constituent denoting the relevant individual, predicate, or proposition. This requirement can thus disambiguate the rhetorical relation performed by a hyperlink. In (26a), for example, the hyperlink appears on a DP (type  $e$ ), so can perform the Identity relation, leading to the tweet in question. In contrast, in (26b), the hyperlink is not a substring of any DP, so Identity is not a possible rhetorical relation. The link is a substring of a sentence, though, so it can provide Evidence for the proposition that the tweet scared investors.

- (26) a. [The CEO's tweet](#) scared investors, yielding a sudden drop in the company's stock.  
 b. The CEO's tweet [scared investors](#), yielding a sudden drop in the company's stock.

On the other hand, just as was observed by Esipova (2019) for co-speech gestures, there may be ambiguity regarding the constituent with which a hyperlink is associating, yielding ambiguity about the rhetorical relation involved. In (27), for example, the link might lead to a photograph identifying the alligator in question (Identity), or to an article recounting the episode (Evidence).

- (27) In typical Florida fashion, the wedding was briefly interrupted when [an alligator](#) wandered into the reception area.

There may also be ambiguity with respect to the semantic type of the destination of a hyperlink. An article, video, or tweet is itself an entity, so may be the destination of an Identity relation. But articles, videos, and tweets are also informative, so may be the destination of an Evidence relation. For example, in (28), the same video may be the destination for the hyperlink in (28a), performing Identity, or (28b), performing Evidence.

- (28) a. [The video](#) got over 200,000 views in under an hour.  
 b. Apparently, at least one bird [was also unsatisfied](#) with the mayor's performance.  
*Destination:* video of a bird repeatedly dive-bombing the mayor's speech.

#### 4.5. Missing pieces

At this point, let us observe a couple of missing pieces in the analysis, focusing for the moment specifically on cases of the rhetorical relation of Evidence.

First, we have observed that this rhetorical relation relates propositions, but hyperlinks, even when used for Evidence, rarely highlight a proposition-denoting constituent. In (28a), for example, the link provides evidence for the sentence as a whole, but highlights only its subconstituent *was also unsatisfied*. Second, speaking of 'the' proposition denoted by a sentence turns out to be overly simplistic, as a hyperlink may target any of several different propositions entailed by a sentence. Finally, we have been somewhat vague about what it means to 'provide evidence' for a proposition.

In the next section, we fill in these details, providing a specific analysis of Evidence uses of hyperlinks in a focus semantics. Specifically, we will argue that highlighting a substring of a

sentence generates a set of propositional alternatives (a question); the link is felicitous if the destination URL resolves the question to the single answer asserted by proposition embedding the link.

## 5. Hyperlinks and focus

Co-speech gesture is known to align with the prosodic structure of the speech it occurs with, with the apex of the gestural stroke aligning with the pitch accent on a stressed syllable. Co-speech gesture can thus provide a window into the information structure of a sentence. Taking this one step further, Ebert et al. (2011) provide evidence that a full gesture phrase (consisting of preparation, stroke, and retraction) may disambiguate the domain of focus marking, even in cases in which pitch accent does not. For example, in (29), the same utterance can be used to respond to two different questions: in (29a), only the direct object is in focus, while in (29b) the entire VP is in focus. The prosodic marking is nevertheless identical, as pitch accent marks only a single syllable in the focused phrase.

- (29) a. Q: What did you eat?  
A: I ate [baNAnas]<sub>F</sub>.  
b. Q: What did you do?  
A: I [ate baNAnas]<sub>F</sub>.

Ebert et al. (2011) hypothesize that in such cases, the span of a full gesture phrase may nevertheless disambiguate the two focus structures. By preference, when gestures appear with a focused DP, the movement of the gesture appears only over the DP, as in (30a); when gestures appear with a focused VP, the movement spans the entirety of the VP, as in (30b). This hypothesis was borne out in a corpus study. For 260 new-information focus-gesture pairs, Ebert et al. showed a close correlation between the onset of the focus phrase and the onset of the gesture phrase.

- (30) a. Q: What did you eat?  
A: I ate [baNAnas]<sub>GESTURE</sub>.  
b. Q: What did you do?  
A: I [ate baNAnas]<sub>GESTURE</sub>.

For hyperlinks, we propose an exactly parallel hypothesis: namely, that the domain of a hyperlink reflects the focus structure of the sentence in which it occurs. To illustrate the intuition, (31) and (32) provide examples in which placement of a hyperlink within a sentence depends on the information structure of the discourse. In (31) and (32), the sentences carrying the hyperlink is identical, as is the destination to which the hyperlink leads. However, due to the preceding discourse, the focus structure is different. In (31), exercise has already been mentioned in the preceding discourse, so there is a new-information focus on the VP, regarding mental health. In (32), mental health has already been mentioned, so there is a new-information focus on the NP, regarding exercise. In such cases, we hypothesize that the hyperlink in the second sentence should preferentially be placed on the focused constituent. Our judgment is that this is indeed the case: hyperlinks are more acceptable when their placement shows congruence with the information structure of the sentence than when their placement does not.

- (31) A variety of lifestyle behaviors have been shown to reduce the likelihood of Alzheimer's and other mental illnesses. As might be expected, older people tend to retain

higher mental capabilities when they engage in regular intellectual activities, such as doing puzzles or learning a foreign language. Other strategies are perhaps more surprising.

- a. Scientists recently showed that [regular cardiovascular exercise](#) may improve mental health later in life.
- b. #Scientists recently showed that regular cardiovascular exercise [may improve mental health](#) later in life.

(32) Performing daily exercise offers health advantages on a diverse number of fronts. As might be expected, frequent light exercise can contribute to lower cholesterol levels and lower rates of diabetes. Other advantages are perhaps more surprising.

- a. Scientists recently showed that regular cardiovascular exercise [may improve mental health](#) later in life.
- b. #Scientists recently showed that [regular cardiovascular exercise](#) may improve mental health later in life.

*Destination:* Scientific article, “Regular cardiovascular exercise reduces the likelihood of mental illness late in life”

### 5.1. A focus analysis of the Evidence relation

The connection between hyperlinks and focus provides us a way to spell out the Evidence relation in more detail, building on definitions of rhetorical relations previously proposed in the literature. Specifically, Asher and Lascarides (2003) and Lascarides and Stone (2009) propose that the rhetorical relation Explanation relates two propositions  $p$  and  $q$ , with the constraint that  $q$  must be an answer to the question ‘Why  $p$ ?’ Thus, in the repeated example (33), the second sentence answers the question: ‘Why did Jill punch the wall in frustration?’

(33) Jill punched the wall in frustration. She missed the deadline by one minute.

We propose a highly analogous analysis for Evidence. In (34), a set of propositional alternatives is generated via a standard calculation of focus (Rooth, 1992), by replacing the hyperlinked constituent with contextually salient alternatives, as in (35a). As in the analysis of Hamblin (1973), this set of propositions generates a question denotation, as in (35b). We propose that Evidence is highly similar to Explanation, but instead of answering the question ‘Why  $p$ ?’ the destination must answer the question generated by the focus alternatives. Specifically, given a destination  $q$  and a proposition  $p$  with alternatives  $\text{Alt}(p)$ ,  $\text{Evidence}(p, q)$  holds if  $q$  provides support for  $p$  as a true answer to the question  $\text{Alt}(p)$ . In (34), the destination must resolve the question ‘What does cardiovascular exercise do?’ by providing evidence that it improves mental health.

(34) Regular cardiovascular exercise [may improve mental health](#) later in life.

- (35) a. {Regular cardiovascular exercise does  $X : X \in \text{Alt}(\text{improve mental health})$ }
- b. What does cardiovascular exercise do?

Because the rhetorical relation makes reference to the question generated by focus alternatives, the analysis predicts that different placements of a hyperlink within a sentence will yield different inferences about its destination. Here, for example, (36a) is likely to link to Ben Carson’s

comment, which provides evidence about what he believes. (36b) might link to a statement by Egyptologists debunking the claim.

- (36) a. Ben Carson incorrectly believes [that the pyramids were built to store grain](#).  
*Inference:* The link will address the Q: What does Carson believe?  
b. Ben Carson [incorrectly](#) believes that the pyramids were built to store grain.  
*Inference:* The link will address the Q: Is Carson's belief correct?

## 5.2. The domain in which focus is interpreted

In theories of focus, two domains are of relevance: first, there is the domain of focus marking—i.e., what is in focus; second, there is the domain of the focus-sensitive operator—i.e., the level at which focus is interpreted. Following Rooth (1992), this latter level is sometimes marked with a squiggle operator. The domain at which the squiggle operator is evaluated has an effect on the meaning. In (37a), for example, interpreting focus on the embedded clause may generate the inference that John said that Mary does not drink tea. In (37b), interpreting focus on the matrix clause may generate the inference that John did not say whether Mary drinks tea. These inferences can be transformed into entailments of the sentence with placement of the overt focus-sensitive operator *always* in (38).

- (37) a. John said that  $\sim$ [Mary drinks [COFfee]<sub>F</sub>].  
b.  $\sim$ [John said that Mary drinks [COFfee]<sub>F</sub>].  
(38) a. John says that  $\sim$ [Mary always drinks [COFfee]<sub>F</sub>].  
b.  $\sim$ [John always says that Mary drinks [COFfee]<sub>F</sub>].

For hyperlinks, we have argued that the domain of focus marking is overtly marked by the placement of the link. On the other hand, the domain in which focus is interpreted is left ambiguous. For cases of Evidence, we have provided an analysis on which this domain is necessarily a proposition-denoting constituent, as the rhetorical relation makes reference to the question generated by its alternatives. Nevertheless, as we have just observed, a given sentence may contain multiple proposition-denoting constituents, any of which can in principle be the level at which focus is interpreted. Example (39) provides an example of such ambiguity.

- (39) a. The senator has long known that  $\sim$ [his bill is [probably unconstitutional](#)].  
*Question:* Is the senator's bill constitutional or not?  
b.  $\sim$ [The senator has long known that his bill is [probably unconstitutional](#)].  
*Question:* What has the senator known all along about his bill?

These two interpretation domains can be teased apart by manipulating another property of the Evidence relation—namely, that Evidence entails that the proposition is true. Thus, if one of the embedding sentences is not true (appearing in a non-veridical environment), then it is not a viable domain in which to interpret the hyperlink. Sentences (40) and (41) present two examples from the corpus that illustrate this point. In (40), *think* does not entail its complement, and, indeed, the context tells us that its complement is false. It would thus be contradictory for the linked source to provide evidence for the embedded clause—that is, to provide evidence that the questioner was indeed talking about cookies. The linked source must therefore provide evidence for the embedding proposition that Carson appeared to think that this was the case.

In contrast, in (41), the matrix clause is a question, so cannot be the target of Evidence; the destination source will not provide information about the addressee's memory. On the other hand, *remember* is a factive verb, so its complement is necessarily true. The link must therefore provide evidence for what Pruitt tried to do with his influence.

(40) Consider Ben Carson, our secretary of housing and urban development, who was asked at a congressional hearing about REOs—a well-known HUD acronym for foreclosed properties—and  $s_1$ [*t* appeared to think  $s_2$ [the questioner was [talking about cookies](#)]].

(41) Former winner E.P.A. chief Scott Pruitt has slunk away— $s_1$ [remember the time  $s_2$ [he tried to use his influence to [get his wife a Chick-fil-A franchise](#)]]?

## 6. Conclusion

Let us conclude briefly. We observed that hyperlink syntax is sensitive to standard constraints on constituent structure. We observed that hyperlink meaning, like gestural meaning, is generally not at-issue, and may project. We provided an initial taxonomy of the rhetorical relations that can be performed by hyperlinks, and provided constraints on the relations that can be performed by a given hyperlink, including the semantic type of the containing constituent and the veridicality of the embedding context. We provided initial evidence that hyperlink placement is sensitive to information structure, and provided an analysis of Evidence uses in terms of focus alternatives. Finally, throughout the paper, we have seen that there are strong parallels—intuitively and formally—between hyperlinks and pointing gestures.

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