Intensionality, contrast and ellipsis
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This paper argues that ellipsis parallelism requires ‘proper’ contrast with an antecedent, and that this contrast requirement is sensitive to intensionality. Evidence is drawn from ellipsis in tautologous free relatives (4), participant-switching verb phrase ellipsis (VPE) (7), and MaxElide effects in sluicing (15).

Ellipsis parallelism and contrast. Since Rooth (1992), verb phrase ellipsis (VPE) has been argued to be governed by an identity condition of semantic parallelism (1) (simplified):

(1) For ε to be elided, ε must be inside a phrase E that has an antecedent A such that:
   (i) \([A] \in F(E)\), the focus membership condition; and (ii) \([A] \neq [E]\), the contrast condition.

Many researchers (Takahashi & Fox 2005, a.o.) assume only the focus membership condition (i) of (1). But recent work has emphasised the crucial role of the contrast condition (ii), which requires E to have A as a ‘proper alternative’. Stockwell (2018) accounts for the ungrammaticality of ellipsis in tautologous conditionals (2) in terms of contrast failure: \([A] = [E] = \text{wrong}'(j)\). Griffiths (to appear) does likewise for so-called Max Elide effects (3): \([A] = [E] = \text{kiss}'(x)(j)\) (elided structure):

(2) If John\(_j\) is wrong, then he\(_j\) is wrong / *he\(_j\) will kiss."

(3) John\(_j\) will kiss someone, but I don’t know who he\(_j\) will kiss."

In both (2) and (3) the focus membership condition is met – \([A] \in F(E)\) is a member of the singleton F(E) – but ungrammaticality results from failing the contrast condition. The elliptical versions can be salvaged by replacing he with a focused proper alternative, e.g. MARY\(_F\), whereby contrast will be satisfied as well as focus membership. I argue based on three case studies that intensionality counts for the contrast condition.

Ellipsis in tautologous free relatives. Consider the status of ellipsis in (4) (Stockwell 2018; cf. Horn 1981: 326 and Russell’s 1905 ambiguity in comparatives):

(4) a. John\(_j\) eats what he\(_j\) eats / *does eat.
   b. Mary believes that John\(_j\) eats what he\(_j\) eats / does eat.

In (4a), wherever the free relative DP takes scope to resolve antecedent containment, and regardless of F-marking, ellipsis is ruled out as a contrast failure: \([A] = [E] = \text{eats}'(x)(j)\). But embedding under intensional believe makes ellipsis grammatical in (4b). This is explained if the contrast condition is sensitive to intensionality. (4b) asserts that Mary is correct, equating what John actually eats with what Mary believes him to eat. The contrast condition is satisfied by the opposition of what John eats in Mary’s belief worlds with what he eats in the actual world, as in (5). Given the syntactic structure in (5a) and the LF in (5b), this de re reading (5e) is the only one available. The de dicto reading (5d) that Mary believes a tautology is unavailable, since both A and E would be interpreted relative to the same set of worlds, Mary’s belief worlds, causing ellipsis to fail the contrast condition. Meanwhile, focus on DOES\(_F\) in (5a) realises contrast on worlds, satisfying focus membership (5f):

(5) a. Mary believes that John eats what he \text{DOES}\(_F\) eat.\(_F\).
   b. Mary believes that [what 4 he] [eats w\(_0\)/w\(_7\)] \text{t}_4 3 John\(_1\) [eats w\(_7\)] \text{t}_3
   c. A = 3 John\(_1\) [eats w\(_7\)] \text{t}_3 \quad \quad \quad \quad \quad \quad \quad \quad [A] = \lambda x.\text{eats}'(w\(_7\))(x)(j)
   d. E\(_{de \, dicto}\) = 4 he\(_1\) [eats w\(_7\)] \text{t}_4 \quad \quad \quad \quad \quad \quad \quad \quad [E_{de \, dicto}] = \lambda x.\text{eats}'(w\(_7\))(x)(j) \quad \quad \quad \quad \quad \quad \quad \quad [A] = [E_{de \, dicto}]
   e. E\(_{de \, re}\) = 4 he\(_1\) [eats w\(_0\)/w\(_7\)] \text{t}_4 \quad \quad \quad \quad \quad \quad \quad \quad [E_{de \, re}] = \lambda x.\text{eats}'(\@)(x)(j) \quad \quad \quad \quad \quad \quad \quad \quad [A] \neq [E_{de \, re}]
   f. F(E_{de \, re}) = \{\lambda x.\text{eats}'(w)(x)(j) \mid w \in W\} \quad \quad \quad \quad \quad \quad \quad \quad [A] \in F(E_{de \, re})

Beyond Stockwell (2018), the difference regarding ellipsis in (4) is a fact specifically about intensional embedding, rather than embedding in general. While intensionality (e.g. believe, modal should) makes ellipsis good (4b), aspectual verbs, which are extensional (Pearson 2016), do not (6a). Intensional embedding can be in the main clause (4b), inside the free relative (6b), or both (6c), with the attendant contrasts among the actual world and different people’s belief worlds. Moreover, these facts are not just about intensionality, but contrasting intensionality – (6d) embeds both A and E under the same person’s beliefs, and contrast failure returns:
(6) a. John$_j$ started to eat what he$_j$ eats / *does eat last year.
   b. John$_j$ eats what Mary believes he$_j$ eats / does eat.
   c. Mary believes John$_j$ eats what Sally believes he$_j$ eats / does eat.
   d. Mary$_m$ believes John$_j$ eats what she$_m$ believes he$_j$ eats / *does eat.

**Participant switching VPE.** The sensitivity of the contrast condition to intensionality also explains ungrammatical cases of VPE with participant switch mismatches. In (7) the subject and object participants switch between the antecedent and elided VPs (Stockwell 2017). Crucial is the symmetrical predicate — viz. *dance-with vs. criticise* (8):

(7) John$_1$ wanted to dance with Mary$_2$, but she$_2$ didn’t want to *dance with him$_1$.

(8) *John$_1$ criticised Mary$_2$, even though she$_2$ wasn’t supposed to criticise him$_1$.

Beyond Stockwell (2017), based on the symmetry of *dance-with*, which is taken to be fundamentally unary (Winter 2018), and assuming PRO carries the F-marking of its controller, ellipsis in (7) passes the focus membership condition of (1) despite participant switching as in (9):

(9) A = PRO$_j$ dance with Mary
    E = PRO$_{mf}$ dance with John
    F(E) = \{dance-with'$(x,j)$ | $x \in D_x\}
    [A] = dance-with'$(j,m) = dance-with'$(m,j)$

However, the contrast condition appears not to be satisfied: while the symmetry of *dance-with* supports focus membership, it also results in A and E meaning the same thing. Intensionality holds the key to (7) passing the contrast condition: A is interpreted with respect to John’s desire worlds, E with respect to Mary’s. In this light, consider that while *want* introduces both the antecedent and elided VPs in (7), it is sufficient for it to introduce only the antecedent (10) or elided VP (11), contrasting desire worlds with the actual world. Where *want* introduces neither the antecedent nor elided VP (12), ungrammaticality results:

(10) John$_1$ wanted to dance with Mary$_2$, and (in the end) she$_2$ did dance with him$_1$.
(11) John$_1$ danced with Mary$_2$, even though she$_2$ didn’t want to dance with him$_1$.
(12) *John$_1$ danced with Mary$_2$, and she$_2$ did / but she$_2$ didn’t dance with him$_1$.

Importantly, the interaction between intensionality and contrast is a fact about ellipsis: despite the redundancy/contradiction of (12), it is perfectly grammatical without ellipsis (13). These facts are also specifically about intensional embedding rather than embedding in general: while intensionality (*e.g. want, modal should*) supports participant switching VPE (7, 10, 11), extensional aspectual verbs (14) do not:

(13) John$_1$ danced with Mary$_2$, and she$_2$ did / but she$_2$ didn’t dance with him$_1$.
(14) *John$_1$ started to dance with Mary$_2$, and she$_2$ did / but she$_2$ didn’t dance with him$_1$.

**MaxElide effects.** Griffiths (to appear) argues that so-called MaxElide effects (3) should be analysed not as the result of a transderivational competition between sluicing and VPE (Merchant 2008), but as contrast condition failures. Beyond Griffiths (to appear), the indexical subject I above the ellipsis site in (15a) means that there is no intensionality contrast with the antecedent, asserted by the referent of I. Compare the improvement in (15b), where the opposition between different people’s epistemic states seems sufficient to license VPE, contrary to what MaxElide or consideration of just the embedded clause would predict:

(15) a. *John$_j$ will kiss someone, but I don’t know who he$_j$ will kiss.*
   b. (I think that) John$_j$ likes someone, and Mary knows who he$_j$ does like.

**In sum,** the contrast condition is active in ellipsis licensing, and intensionality counts: contrast is satisfied when the clause containing ellipsis and its antecedent are interpreted relative to different (sets of) worlds.

The Syntax and Semantics of Mandarin give-marked Double-object Constructions

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Introduction: Since Pylkkänen’s influential (2002) work on double object constructions (DOC) cross-linguistically, it has become widely accepted to differentiate DOCs that realize a high applicative from those that realize a low applicative, each with distinct syntax and semantics. In this paper, I examine Mandarin Chinese (MC) give-marked DOCs in light of Pylkkänen’s typology and argue that they do not fit neatly into the proposed categories. Focusing on ‘gei’ affixed to a transitive verb (V-gei), I argue instead that ‘gei’ spells out a bleached transfer event in the spirit of Bruening (2010, 2015). I implement this bleached use of ‘gei’ by stripping away its event description, while retaining the thematic interpretation of a recipient theta-role (as noted by Zhang 1998). I show how this analysis accounts for the observed properties of the V-gei DOC, and suggest how this can be extended to the so-called prepositional dative construction (PDC) which has been argued to also pattern with the V-gei DOC.

MC give-marked DOC: The MC verb of giving ‘gei’ ‘give’ as a lexical verb takes two arguments, appearing in a DOC frame with the indirect object (IO) preceding the direct object (DO).

(1) Zhangsan gei-le Lisi yi-ben shu.
Zhangsan GIVE-ASP Lisi one-CL book
‘Zhangsan gave Lisi a book.’

MC ‘gei’ can also be used to derive ditransitive constructions from transitive verbs. In such cases, it appears affixed to the main verb, and the indirect object introduced by ‘gei’ precedes the DO. Omitting ‘gei’ is impossible in these derived ditransitives, and the IO is always interpreted as a recipient (Zhang 1998). I illustrate with a verb of creation below.

(2) Zhangsan xie-*(gei)-le Lisi yi-feng xin.
Zhangsan write-GIVE-ASP Lisi one-CLS letter
‘Zhangsan wrote Lisi a letter.’

Paul & Whitman (2010) show that in these DOCs, the IO introduced by gei is located ‘high’ outside at least a VP as in Pylkkänen’s high applicative. Evidence for this comes from the distributive quantifier ‘ge’ ‘each’, which Soh (2005) argues adjoins either to a vP or VP. Since ge can intervene between the IO and DO, the IO must thus be external to a v/VP containing the DO.

(3) Zhangsan xie-gei-le tamen ge yi-feng xin.
Zhangsan write-GIVE-ASP them each one-CLS letter
‘Zhangsan wrote each of them a letter.’

On the other hand, the give-marked DOC fails Pylkkänen’s (2002) diagnostics for high applicatives. That is, ‘gei’ cannot be affixed to unergative or stative verbs (Paul & Whitman 2010).

(4) *Zhangsan tiaowu-gei-le Lisi.
Zhangsan dance-GIVE-ASP Lisi

(5) *Wo kan-gei-zhe Mali bao ne,
1SG watch-GIVE-DUR Mary bag PRT
bu neng likai.
NEG can leave

Pylkkänen’s high-low applicative typology thus cannot account for MC give-marked DOCs. Syntactically, they seem to be located high above the v/VP like high applicatives, but semantically, they have the semantics of low applicatives in denoting a relation between two DPs.

Proposal: Building on ideas from Bruening (2010, 2015), I propose that ‘gei’ used to form DOCs is a bleached version of the regular verb of giving denoting a transfer event with a recipient and theme participant. The theme is a direct argument of the event (Kratzer 1996; Bruening 2015). It is bleached in the sense that it loses its event description and acquires the event description of its complement, an eventive VP. However, since it retains its argument structure, specifically a recipient role, it enables a regular transitive verb to acquire an additional argument interpreted as recipient (Zhang 1998; Lin & Huang 2015). Semantically, bleached ‘gei’ takes as its first argument a predicate of events that fills in its event description and a second argument interpreted as a recipient. The eventive VP, however, must
be transitive and contain a theme argument. This can be tied to the meaning of a recipient semantic role; an individual is a recipient only if there is something received. We can formalize this as part of the meaning of the recipient role (Jerro 2016).

(6) a. \([\text{gei}]: \lambda x y \lambda e [\text{give}(e, x) \& \text{recipient}(e, y)]\]
   b. \([\text{gei}_\text{bleached}]: \lambda P \lambda s \lambda t \lambda x \lambda e [P(e) \& \text{recipient}(e, x)]\]
   c. \(\text{recipient}(e, x)\) is true iff \(\exists y [\text{theme}(e, y) \rightarrow \text{receive}(x, y)]\)

The structure and semantics of the V-gei construction is shown below. Head movement of the main verb through ‘gei’ to the agent-introducing VOICE derives the correct surface order.

(7) \([\text{VoiceP}\text{Zhangsan} [\text{Voice Voice} [\text{geiP Lisi} [\text{gei} \text{gei} \text{VP write letter}]]]]\]

(8) a. \([\text{VP}]: \lambda e [\text{write}(e, a \text{ letter})]\]
   b. \([\text{gei}^1]: \lambda x \lambda e [\text{write}(e, a \text{ letter}) \& \text{recipient}(e, x)]\]
   c. \([\text{geiP}]: \lambda e [\text{write}(e, a \text{ letter}) \& \text{recipient}(e, \text{Lisi})]\]

**Predictions and Extensions:** The proposed analysis captures Soh (2005) and Paul & Whitman’s (2010) observation that a distributive quantifier can intervene between the IO and DO. It also explains why semantically the V-gei construction behaves like a low applicative denoting a transfer of possession. In the analysis here, it is the lexical semantics of ‘gei’ as a bleached transfer verb that imbues it with the transfer of possession semantics rather than Pykkänen’s low applicative head. This is attractive as it has been observed that cross-linguistically, the verb of giving seems to be used to mark DOCs with the transfer of possession semantics rather than Pylkkänen’s low applicative head. This is attractive based on the same DOC-PDC alternation in English.

(9) Zhangsan xie-le yi-feng xin gei Lisi.

Zhangsan write-ASP one-CL letter GIVE Lisi

‘Zhangsan wrote a letter (and gave it) to Lisi.’

Most authors translate the PDC with the IO in a PP, parallel to the English DOC-PDC alternation. There are, however, reasons to believe that this is misleading. Proponents of a non-derivational approach to the DOC-PDC alternation in English cite various differences between them. For example, Harley (2002) notes that there is an animacy requirement on the DOC that is not observed in the PDC. Biggs (2014) notes that the animacy requirement holds not just of the V-gei DOC but also the PDC.

(10) a. *Zhangsan xie-gei-le Lundun yi-feng xin

Zhangsan write-GIVE-ASP London one-CL letter

‘Zhangsan wrote London a letter.’

b. *Zhangsan xie-le yi-feng xin gei Lundun.

Zhangsan write-ASP one-CL letter GIVE London

‘Zhangsan wrote a letter (and gave it) to London.’

Furthermore, the PDC also shows the same restrictions as the V-gei DOC in failing high applicative tests; it cannot occur with unergative and stative verbs. This indicates that the supposed PDC marked by ‘gei’ also requires a semantic relation between two individuals rather than an individual and an event, and is not a transfer of location.

(11) *Zhangsan tiaowu-le gei Lisi.

Zhangsan dance-ASP GIVE Lisi

(12) *Wo kan-zhe bao gei Mali ne,

ISG watch-DUR bag GIVE Mary PRT

bu neng likai.

NEG can leave

Contrary to authors like Paul & Whitman (2010) and Jiang (2016), I propose then that the PDC has an identical semantic representation as the V-gei DOC but with different syntactic structures, in line with a post-syntactic view of semantic interpretation and argument structure (Wood & Marantz 2017). In the V-gei DOC, the transitive VP merges as a complement before the recipient is merged while in the PDC, the recipient is merged first before the transitive VP.
Adverbal Adjunct Clauses and their LFs
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Aim: We develop an account of unexpected future orientations (UFOs, following Copley, 2008) in both if-clauses and temporal adverbal adjunct clauses (AACs). We provide a compositional syntax-semantics for three types of AACs which derives the observation that UFOs in temporal AACs are dependent on the main clause, while UFOs can appear independently in if-clauses. We compare these to a third class of AACs, exemplified by because-clauses (as well as although-clauses etc.) which never license UFOs.

Data: In each of the AACs in (1a-c) the finite verb is in the present tense. However, in (1a), based on Crouch (1993), the simple present in the if-clause may have a UFO independently of the tense/aspect of the main clause (Kaufmann, 2005). The temporal AAC in (1b) can only have a UFO when the main clause contains a future modal (e.g., will). Finally, compare the because-clause in (1c) which can never license a UFO.

(1)  a. If John comes out smiling later, then the interview {will go/went/is going} well.
    b. When John comes out smiling later, the interview {will go/*went/*is going} well.
    c. *Because John comes out smiling later, the interview {will go/went/is going} well.

The future: While present and past states of affairs are settled (i.e., their truth or falsity can no longer be influenced), the future is inherently unsettled (Thomason, 1984; Condoravdi, 2001; Kaufmann, 2005). Several recent proposals have taken modal unsettledness to be a licensing condition on the (unscheduled) future (Laca, 2015; Banerjee, 2018a,b; Williamson to appear). Williamson (to appear) proposes a covert future operator FUT (see also Matthewson, 2012; Giannakidou & Mari, 2018) which carries a presupposition that the modal context in which it appears is diverse (unsettled) wrt to whether its prejacent holds at a future time. This is captured by making the denotation assignment function sensitive to a modal context parameter $S$ (a set of worlds shifted to the modal base of the most local modal operator) (Yalcin, 2010; Portner, 2018). The following denotation is a minor modification of Williamson’s semantics which renders it more suitable to handle the data considered here. This function takes a world-time proposition, a reference time argument, a future time argument and a world argument, and returns true iff the proposition holds of the world and future time arguments. FUT also carries a presupposition that the modal context $S$ contains some worlds for which the proposition holds at the future time and it contains some worlds for which the proposition does hold at the future time. The future time argument is then subject to existential closure (Heim, 1982).

\[
[FUT]^S = \lambda p_{s, it}. \lambda t_i. \lambda t^i: \exists w' \in S: \langle w', t^i \rangle \in [p]^S \land \exists w'' \in S: \langle w'', t' \rangle \notin [p]^S \]. \lambda w, t': t \rightarrow \langle w, t' \rangle \in [p]^S
\]

Assertion and presupposition: When a proposition is asserted or presupposed, it is taken to be settled according to a set of worlds (the speaker’s epistemic alternatives, and the worlds compatible with the common ground respectively). Modifying the proposal of Alonso-Ovalle & Menendez-Benito (2008), we propose that bare assertions contain a covert modal which universally quantifies over the modal context, which, in matrix assertions is the speaker’s epistemic state in the actual time and world (Epist $w', t^*, \text{speaker}$).

\[
[\text{ASSERT}]^S = \lambda p_{s, it}. \forall w' \in S: \langle w', t^* \rangle \in [p]^S
\]

It is well established that because-clauses may be asserted, while temporal AACs are presupposed (Hooper & Thompson, 1973; Sawada & Larson, 2004). For instance, this can be seen by comparing the question-answer pairs in (4) and (5). In (4), the content of the because clause can be at-issue (e.g., the main point of a question). In (5), on the other hand, the content of the when clause cannot be felicitously denied as it is not at-issue (i.e., it is presupposed).

(4)  A: Was John smiling because the interview was going well?
    B: No, the interview was a disaster.
(5) A: Was John smiling when the interview was going well?
B: #No, the interview was a disaster.

Since a *because* clause is asserted, and a temporal AAC is presupposed, neither is able to license FUT. However, when temporal AACs are predicated of a time in the scope of a future-licensing modal operator, they can dependently exhibit UFOs. In contrast, *if*-clauses are neither presupposed nor asserted (Sæbø, 2011). Rather, the antecedent of an indicative conditional is required to be possible (von Fintel, 1998), but not certain (Veltman, 1986). This is compatible with the presupposition of FUT, and UFOs are licensed freely in indicative *if*-clauses.

**Details:** Caponigro (2004) proposes that temporal AACs are PP-like free relatives. They serve to restrict the reference time of the main clause to a definite time denoted by the free relative (6a). In the case of *when*-clauses, the preposition is covert, while the *wh*-operator is overt. In *before*- and *after*-clauses the situation appears to be reversed. In either case, the content of a temporal AAC is presupposed. In all worlds compatible with the *common ground* (Stalnaker, 1978) (i.e., the *context set, cs*), there is some time which makes *p* true (6c). This renders temporal AACs unsuitable environments to embed FUT since if *p* contains FUT the presupposition of the *when* clause will lead to a contradiction. However, nothing in the semantics of FUT precludes the temporal free relative being associated with a future time, provided that the future time is independently licensed. For this reason, temporal AACs exhibit UFOs only when the main clause features a future reference time.

(6) a. \([\text{Free.Rej}[\text{when}_1 [p(w) \ldots t_1]]]^{S} = ut([w, t] \in [p]^{S})\]
   b. \([\text{when}_p, \text{ASSERT}(\text{PAST}(q))]^{S} = 1 \text{ iff } \forall w \in \text{Epist}_{w, t^*, sp} : \exists t < t^* :\]
      \([w, t^*] \in [q]^{\text{Epist}_{w, t^*, sp}} \land t = ut'([w, t'] \in [p]^{\text{Epist}_{w, t^*, sp}})\]
   c. **presupposes:** \(\forall w \in \text{cs} : \exists t' : [w, t'] \in \text{Epist}_{w, t^*, sp}^{cs}\)

Consider a conditional construction. Kratzer’s (1986, 2012) *if*-clause-as-restrictor analysis requires that the domain of an operator in the main clause is restricted by the antecedent clause. When the main clause does not contain an overt modal, it is standardly assumed that it contains a covert epistemic necessity operator (i.e., ASSERT). Nothing about the semantics of an indicative *if*-clause therefore conflicts with the presupposition of FUT. Indeed, it has often been noted that conditionals are felicitous only when the domain of quantification of the modal operator (i.e., ASSERT) contains both *p* and \(\neg p\) worlds (Veltman, 1986).

(7) a. \([\text{if}_p, \text{ASSERT} q]^{S} = 1 \text{ iff } \forall w \in (\text{Epist}_{w, t^*, sp} \cap p(t^*)) : [w, t^*] \in [q]^{\text{Epist}_{w, t^*, sp} \cap p(t^*)}\]
   b. **presupposes:** \(\exists w \in \text{Epist}_{w, t^*, sp} : [w, t^*] \in [p]^{\text{Epist}_{w, t^*, sp}} \land \exists w' \in \text{Epist}_{w, t^*, sp} : [w', t^*] \notin [p]^{\text{Epist}_{w, t^*, sp}}\)

Both *when*-clauses and *if*-clauses can restrict quantificational elements in the verbal spine, and neither can exhibit main clause phenomena such as argument fronting (Sawada & Larson, 2004; Haegeman, 2010). In contrast, *because*-clauses never function as restrictors (Johnston, 1994). Rather, *because* is a sentential operator that has an at-issue content identical to coordination of two propositions, each of which features ASSERT. *Because*-clauses predictably behave like root clauses, not only in exhibiting main clause phenomena (Haegeman, 2010), but also with respect to licensing of the future: they require an appropriate modal within the AAC in order to license FUT. In other words, they can never exhibit UFOs.

The Temporal Anteriority/Posteriority Parameter in Inferentials
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Introduction This paper proposes a parameterization of semantic variation among inferential expressions including epistemic modals and evidentials (I use the term inferentials as the cover term for the two categories). With the observation that the English modal should and the Japanese indirect evidential yooda restrict the temporal relation between the prejacent (PR) and the proposition serving as evidence (Evidence Proposition, EP), I claim that the variation in them is parameterized in terms of which of the two propositions temporally precedes the other.

The basic idea What is at issue is seen in (1) and (2) (# on should-examples means that should in them cannot be interpreted epistemically). (1) shows that the inference with yooda, but not with should, allows EP (there are puddles) to serve as evidence for PR (it rained), while should, but not yooda, is felicitous in (2), where EP is it is raining and PR is puddles appear.

(1) (Seeing puddles on the ground) (2) (Seeing raindrops falling heavily from a window)
   a. # It should have rained. a. Puddles should appear.
   b. Ame-ga futta yooda. b. # Mizutamari-ga dekiri yooda.
      rain-Nom fell yooda        puddles-Nom form yooda
      ‘It seems that it rained.’  ‘It seems that puddles will appear.’

I argue that the two inferentials restrict the temporal relation between PR and EP. Letting earliest(p) be the initial time p becomes true, should requires earliest(EP) < earliest(PR), and yooda requires earliest(PR) ≤ earliest(EP). Given the fact that raining precedes the appearance of puddles, we have earliest(PR) < earliest(EP) in (1), which is compatible only with yooda, and earliest(EP) < earliest(PR) in (2), which goes well only with should (Matthewson (2015) similarly argues that should requires the evidence to precede PR’s event, but her analysis rules out (2a), where raining and the appearance of puddles temporally overlap).

It might be argued that what matters is the causality. In (1), PR’s event causes EP, while in (2), EP causes PR. So the contrast might be explained if we assume that should requires EP to cause PR, and yooda requires PR to cause EP (as in Davis and Hara (2014)). But (3) and (4) show that those causal requirements are insufficient to capture the two inferentials’ distribution.

(3) (John comes to university in a suit only if he is going to a party that night. Yesterday, you saw him wearing a suit at the university at lunchtime. Today, you say)
   #John-wa kinoo partii-ni syussekisita yooda.  [PR = John attended a party.]
   John-Top yesterday party-to attended yooda [EP = John wore a formal suit.]
   ‘It seems that John went to a party yesterday.’

(4) (John is a forecaster and always predicts correctly how the weather is going to be. Now, it is raining. You and a friend are discussing whether John predicted that rain. You say)
   #John should have predicted that rain.
   [PR = John predicted that rain.] [EP = it is raining.]

In (3), the event in PR causes that in EP, but earliest(EP) < earliest(PR). In (4), the event in EP causes the event in PR, but earliest(PR) < earliest(EP). The oddity in those examples indicates that the temporal requirements proposed just above are necessary.

Implementation For the sake of perspicuity, I adopt the pronominal view of tenses (Kratzer (1998)). So we have the following denotations for present- and past- tensed propositions:

(5) a. \[ \text{Pres } p \] = \lambda w. \[ p \]_t (t_1)(w). (Presupposition: \( t_1 \subseteq t_0 \) (\( t_0 \) is the utterance time))
   b. \[ \text{Past } p \] = \lambda w. \[ p \]_t (t_1)(w). (Presupposition: \( t_1 < t_0 \))

Following Beaver and Condoravdi (2003), I adopt the earliest-operator as in (6a). It takes a proposition p and picks up the unique p-time that precedes any other p-time. Since its argument must be of type \( \langle s, \langle i, t \rangle \rangle \), I assume the standard abstraction rule as in (6b) to change propositions of type \( \langle s, t \rangle \) (those in (5)) to those of type \( \langle i, \langle s, t \rangle \rangle \). (6c) shows how it works.

\[ \text{Implementation}\]
\[ \text{Introduction}\]
(6) a. \( \text{earliest}_w(p) = \forall t' \forall t (w') \left[ p \right]^{\alpha}(t)(w') = t/t' \) for some world \( w' \) that is maximally similar to \( w \) (c.f. Beaver and Condoravdi (2003)).

b. \( \left[ \alpha \right]^{\#} \) can be shifted to \( \forall t \left[ \alpha \right]^{\#}(t)(w) \).

c. \( \left[ \text{Past} \right]^{\#} \) can be shifted to \( \forall t \left[ \alpha \right]^{\#}(t)(w) \).

I argue that should and yooda have the following definedness conditions (I do not commit to what they assert. They involve some kind of inference in their assertion).

(7) Let \( q \) be the contextually salient proposition serving as evidence.

a. \( \text{should} \left[ (p) \right]^{\#}(w) \) is defined only if \( \text{earliest}_w(q) < \text{earliest}_w(p) \).

b. \( \text{yooda} \left[ (p) \right]^{\#}(w) \) is defined only if \( \text{earliest}_w(p) \leq \text{earliest}_w(q) \).

(7b) might look incompatibl with the case where the prejacent describes a future event as in (8), since future events cannot precede \( \text{earliest}_w \). However, (7b) can accommodate it if we assume that the Japanese future-interpreted form is a modal (c.f. Enç (1996)), as in (9).

(8) (You watch a weather forecast saying that it will rain. You say)

\( \text{Ame-ga } \text{futtayooda.} \) [\( \text{PR = it will rain.} \)]

\( \text{[EP = the weather forecast says it will rain.}\)

'It seems/I hear' that it will rain.'

(9) \( \left[ \text{Future} \right]^{\#} = \lambda \forall w \left[ \left[ w' \in MB(w) \rightarrow \exists t \left[ t < t' \wedge \left[ p \right]^{\#}(t)(w') \right] \right] \right] \).

(9) becomes true at \( t \) if it follows from the available facts at \( t \) that \( p \) will be true after \( t \), so \( \text{earliest} \text{(PR)} \) in (8) is the moment the available facts begin to entail that it will rain. That moment precedes the time that the weather forecast starts to say that it will rain, fulfilling (7b).

Parameterization The temporal contributions we have seen can be parameterized as follows:

\[
\begin{array}{ccc}
\text{should} & & \text{yooda} \\
\text{[PR is anterior/posterior to EP]} & \text{[posterior]} & \text{[anterior]} \\
\end{array}
\]

If this parameter exists, we expect that the requirements in (7) are not idiosyncratic to should and yooda. This prediction is borne out. Matthewson and Truckenbrodt (2018: 298-299) observe that the German modals sollte and müsste show the same temporal restriction as should does. (11) is acceptable in (11a), but not (11b). (11a) satisfies \( \text{earliest} \text{(EP)} < \text{earliest} \text{(PR)} \) in (7a) since poisoning precedes M being sick. But (11b) violates \( \text{earliest} \text{(EP)} < \text{earliest} \text{(PR)} \) since the doctors begin to look worried after they know M’s condition. Therefore (11) shows that the three modals are all [anterior].

(11) Sie sollte/müsste sehr krank sein. [\( \text{PR = she is very sick.} \)]

she sollte/müsste very sick be

‘She should be very sick.’

a. (P poisons M’s food and leaves. Later P says) [\( \text{EP = P poisoned M’s food.} \)]

b. # (P visits M in the hospital. P sees through the window of the hospital room that the doctors look worried. P says) [\( \text{EP = the doctors look worried.} \)]

Like yooda, a Japanese reportative evidential sooda can be used in (8), while they cannot in (12), where \( \text{earliest} \text{(EP)} \) precedes \( \text{earliest} \text{(PR)} \) (since PR is past-tensed, so \( \text{earliest} \text{(PR)} \) is the moment it started to rain). This indicates that yooda and sooda are both [anterior].

(12) (Yesterday morning, you watched a weather forecast that it would rain that afternoon. Today, you say)

\#Kinoo \( \text{ame-ga } \) futta yooda/sooda. [\( \text{PR = it rained yesterday.} \)]

\( \text{yesterday rain-Nom fell } \) yooda/sooda [\( \text{EP = the forecast said it would rain.} \)]

'It seems/I hear' that it rained yesterday.'

These facts indicate that the parameter in (10) is cross-linguistically at work in the semantic variation among inferentials, introducing a new perspective into the formal typology of them.