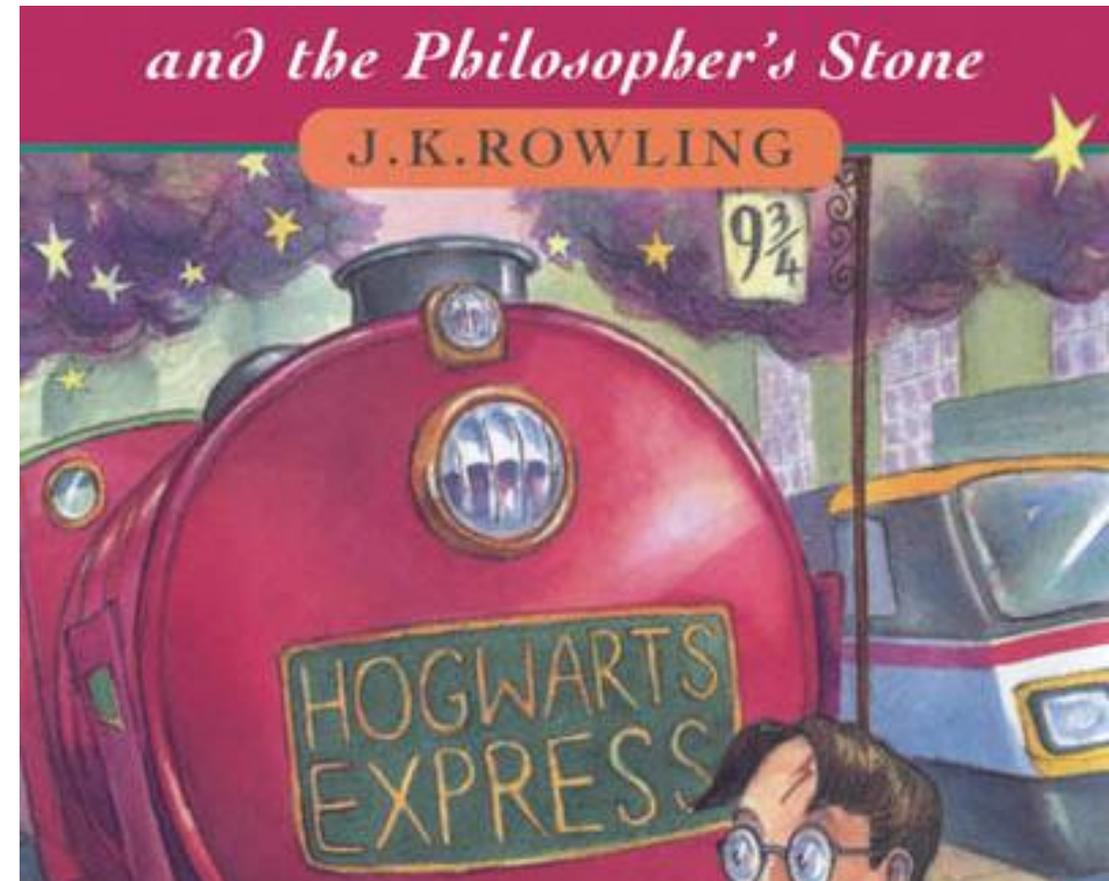


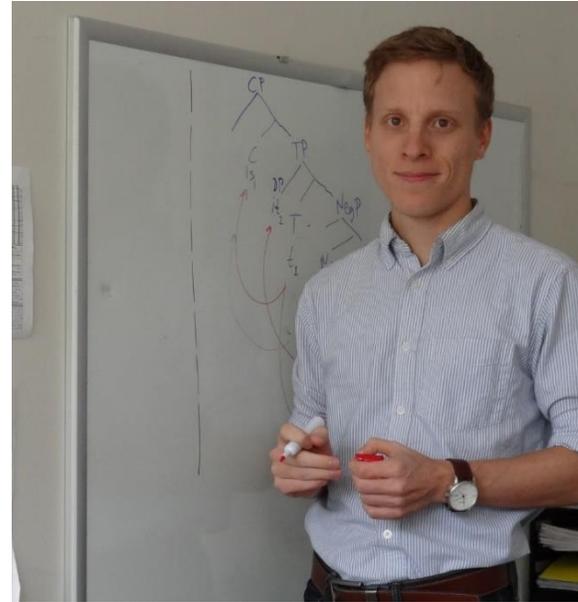
TOWARDS AN INDEXICAL
THEORY OF TENSE
IN FICTION

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Netherlands Organisation
for Scientific Research

Tense and aspect in Western European languages

- What:
 - Commonalities in the semantics and pragmatics of tense-aspect forms like the PRESENT, the PAST, the PERFECT.
 - Cross-linguistic variation in distribution and meaning.

Tense and aspect in Western European languages

- Commonalities in the semantics and pragmatics of tense-aspect forms like the PRESENT, the PAST, the PERFECT.
 - Cross-linguistic variation in distribution and meaning.
- How:
 - Form-based approach (compositional semantics).
 - Data driven approach through parallel (translation) corpora.

Tense and aspect in Western European languages

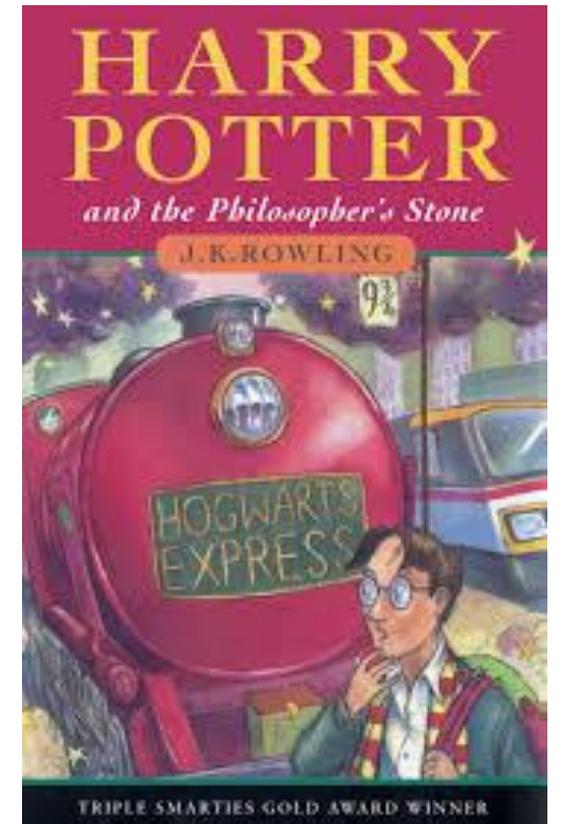
- Form-based approach (compositional semantic perspective).
 - Data driven approach through parallel corpora.
-
- **Methodology:** *Translation Mining*
 - Ground cross-linguistic semantics in multilingual data from translation corpora.
 - Different corpora ~ different language registers.

Tense and aspect in Western European languages

- Ground cross-linguistic semantics in multilingual data from translation corpora.
 - Different corpora, different language registers.
-
- Today's focus: tense use in fiction.



Albert Camus (1942). *L'Étranger*.
Van der Klis et al (2020, 2022)



Roadmap

- Background: literature on tense use in narrative discourse (DRT, SDRT).
- Tense use in discourse and dialogue: data from *Harry Potter and the Philosopher's Stone* and its translations.
- Tenses used in discourse and dialogue are significantly different.
- Zooming in on tense use in dialogue: towards an indexical theory of tense in fiction.



Background

Literature on tense use in narrative discourse

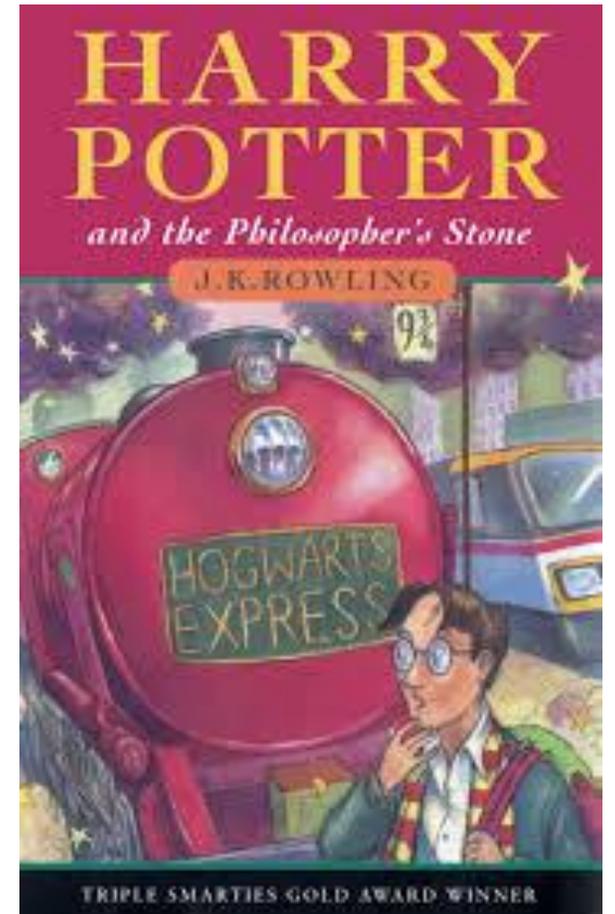
- Stories are generally told in the PAST tense (Fleischmann 1990).
- Dynamic theory of tense: PAST tense is anaphoric, forward movement of the story time (Partee 1973, 1984).
- Sequence of events in narration, background information contributed by states (temporal overlap).

Literature on tense use in narrative discourse

- Stories are generally told in the PAST tense (Fleischmann 1990).
- The PAST tense is anaphoric (Partee 1973, 1984).
- Linguistic features of tense use in narrative discourse involve temporal anaphoricity in combination with lexical, compositional and grammatical aspect (Discourse Representation Theory, DRT Kamp & Reyle 1993).
- Rhetorical relations affecting temporal structure (Segmented Discourse Representation theory, SDRT, Lascarides & Asher 1993).

Discourse and dialogue

- Next to narrative discourse, novels sometimes contains dialogue.
- Example: J.K. Rowling (2012). *Harry Potter and the Philosopher's Stone*.



Tense use in discourse and dialogue

- Dialogue: parts in which the characters talk to each other.

dialogue	discourse	dialogue
'You <u>can</u> 't blame them,'	<u>said</u> Dumbledore gently	'We've <u>had</u> precious little to celebrate for eleven years'

Tense use in dialogue

- Dialogue: parts in which the characters talk to each other.
- Tense use in dialogue is understudied – no dedicated literature.

dialogue	discourse	dialogue
'You <u>can</u> 't blame them,'	<u>said</u> Dumbledore gently	'We've <u>had</u> precious little to celebrate for eleven years'



*Tense use in discourse and dialogue:
a Translation Mining approach*

Temporal dimension of dialogue

- Characters talk about the current situation, they plan actions for the future, they reflect on what happened in the past.
- We expect to find PAST, PRESENT and FUTURE tense in dialogue.
- Check the distribution of tenses in dialogue through *Translation Mining*.

dialogue	discourse	dialogue
'You <u>can</u> 't blame them,'	<u>said</u> Dumbledore gently	'We've <u>had</u> precious little to celebrate for eleven years'

Splitting discourse and dialogue

- *Translation Mining* takes a corpus perspective ~ create a dataset.
- Select sentences containing a finite verb form from chapters 1+17.
- Parts that appear between quotation marks are selected as dialogue; remaining text is discourse.
- Dataset: 481 discourse contexts and 320 dialogue contexts.

dialogue	discourse	dialogue
'You <u>can</u> 't blame them,'	<u>said</u> Dumbledore gently	'We' <u>ve had</u> precious little to celebrate for eleven years'

Annotation in a parallel corpus

- Today's languages: English, Swedish, Spanish, Dutch, German, French.
- Align the English sentences with their translations.
- Match the finite verbs in the original with their counterparts in the translation (manual).
- Annotate the verb forms (manual, language specific labels, traditional grammar): *present perfect, voltooid tegenwoordige tijd, Perfekt, pretérito perfecto compuesto, etc.*

Tense distribution in narrative discourse: verb forms per language

English

Label	↕	Count	⌵
simple past		414	
past continuous		37	
past perfect		24	
simple present		4	
past perfect continuous		1	
future in the past		1	

German

Label	↕	Count	⌵
Präteritum		449	
Plusquamperfekt		26	
Präsens		6	

Spanish

Label	↕	Count
pretérito indefinido		332
pretérito imperfecto		124
pretérito pluscuamperfecto		18
presente		3
estar (imperfecto) + gerundio		2
futuro en el pasado		1
ir + gerundio		1

French

Label	↕	Count	⌵
passé simple		321	
imparfait		130	
plus-que-parfait		24	
passé récent du passé		3	
présent		2	
passé antérieur		1	

Dutch

Label	↕	Count	⌵
ovt		453	
vvt		23	
ott		4	
ovtt		1	

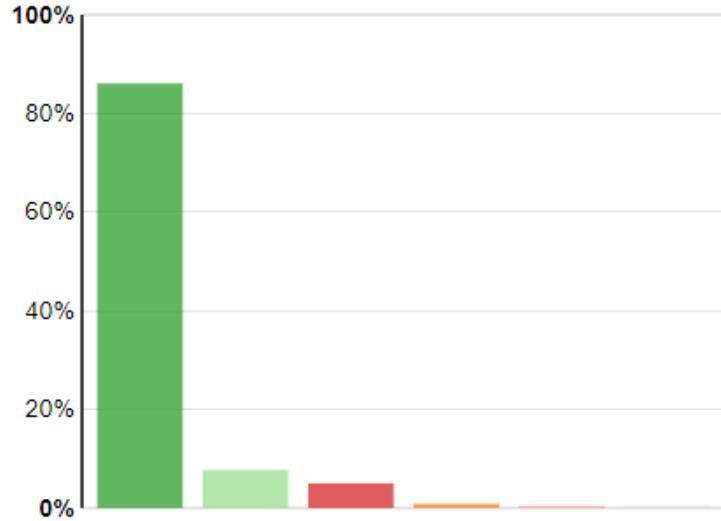
Swedish

Label	↕	Count
imperfekt		449
pluskvamperfekt		27
presens		5

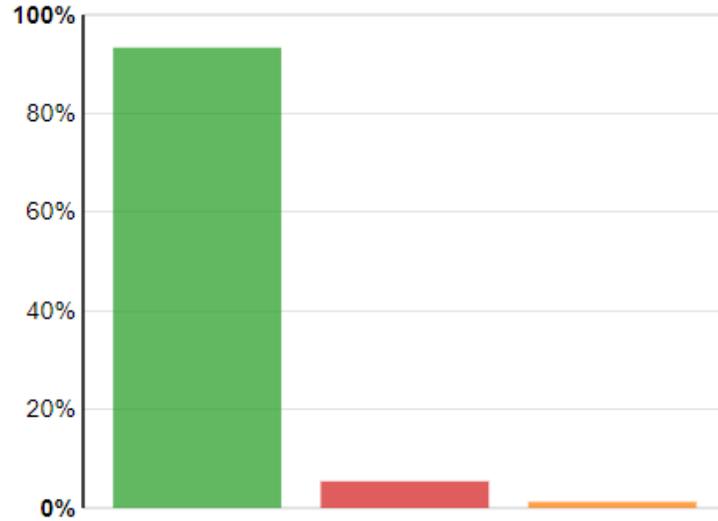
Tense in discourse: charts per language

Colour coding: dark green is SIMPLE PAST or PERFECTIVE PAST, light green is IMPERFECTIVE PAST, red is PAST PERFECT, orange is PRESENT.

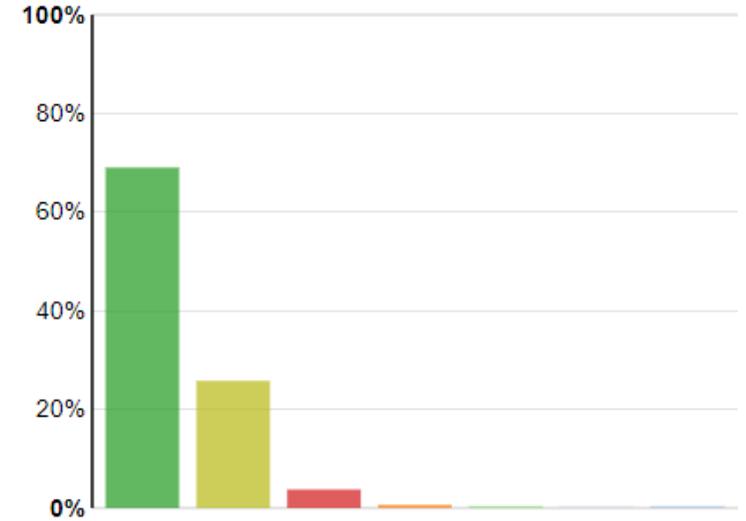
English



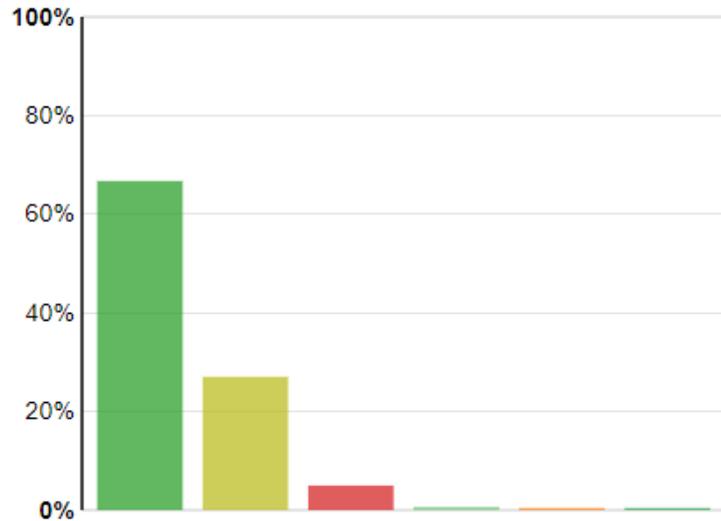
German



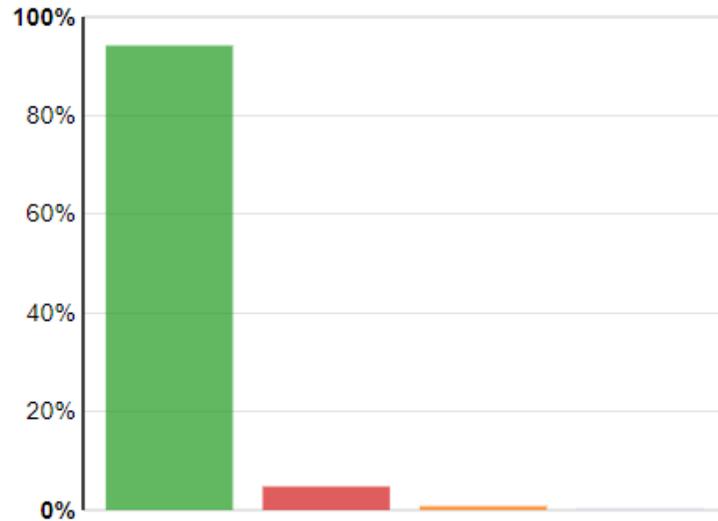
Spanish



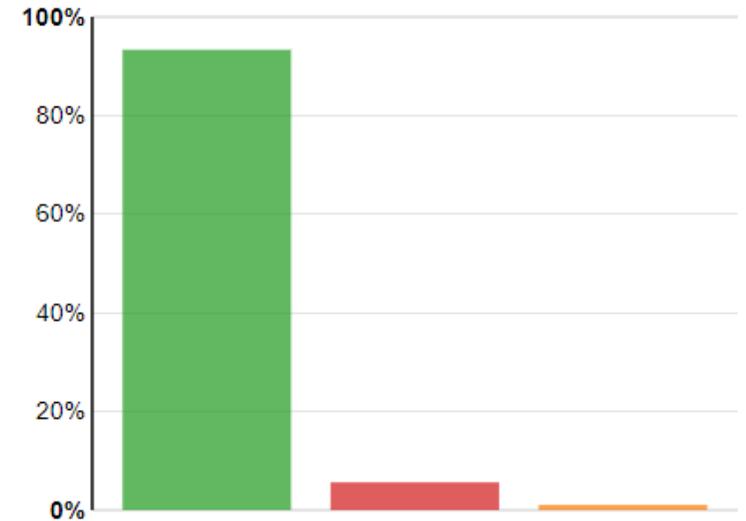
French



Dutch



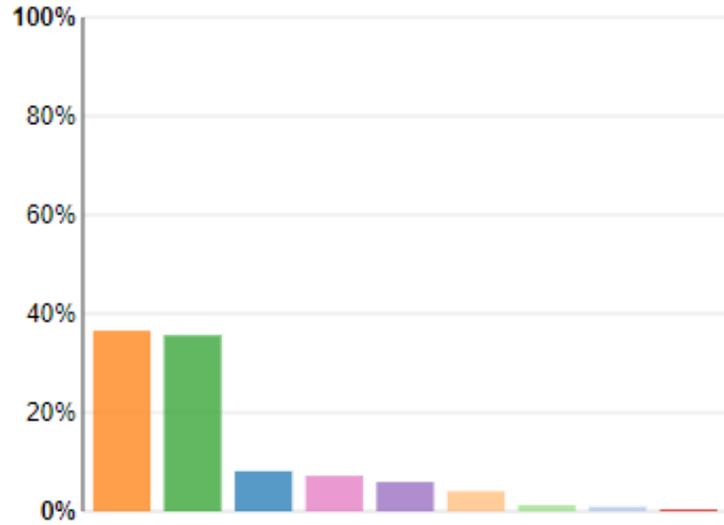
Swedish



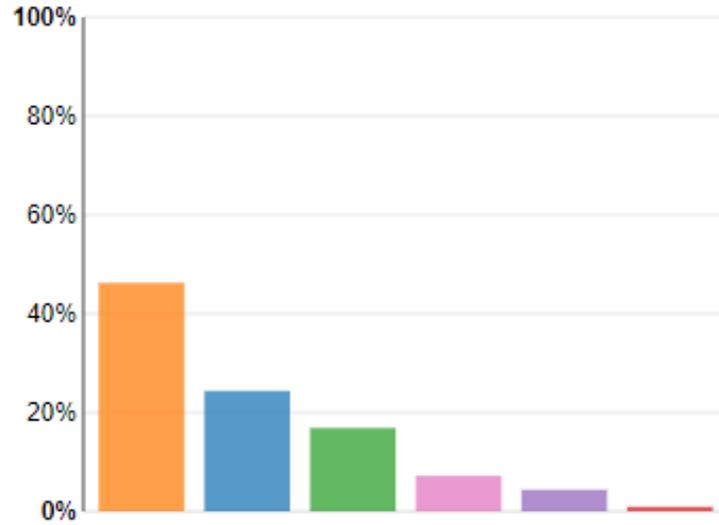
Tense in dialogue: charts per language

Colour coding: orange is PRESENT, blue is PRESENT PERFECT, dark green is SIMPLE PAST or PERFECTIVE PAST, light green is IMPERFECTIVE PAST, purple is FUTURE.

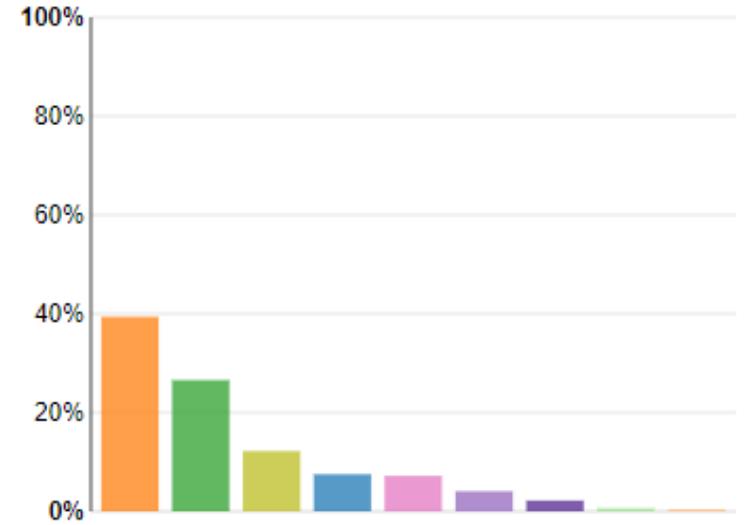
English



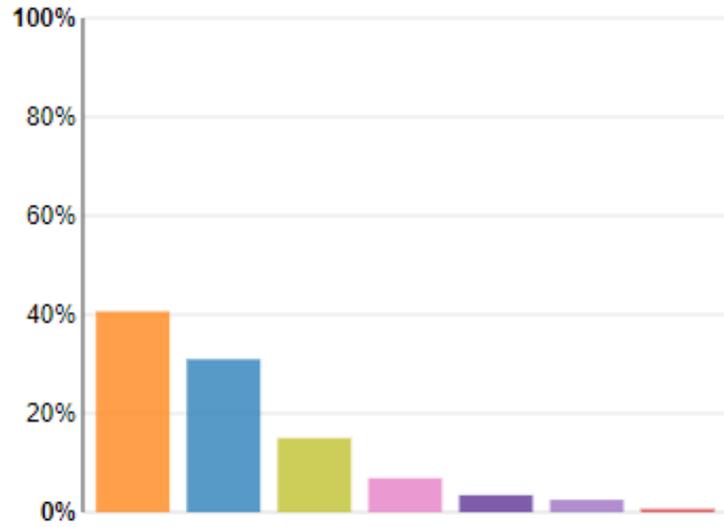
German



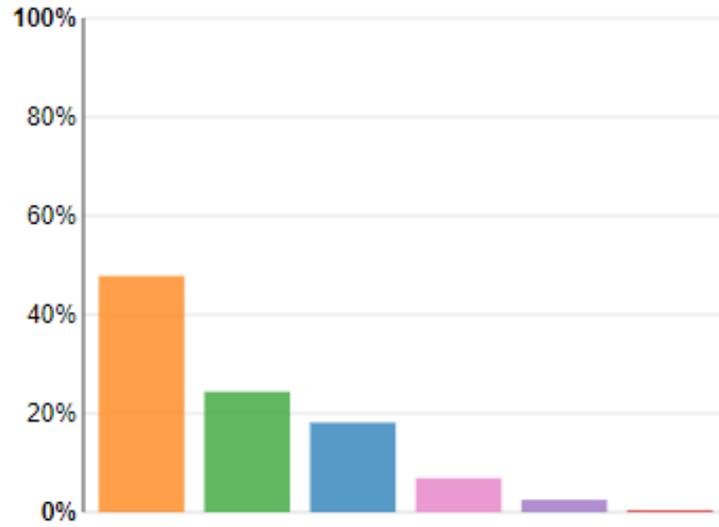
Spanish



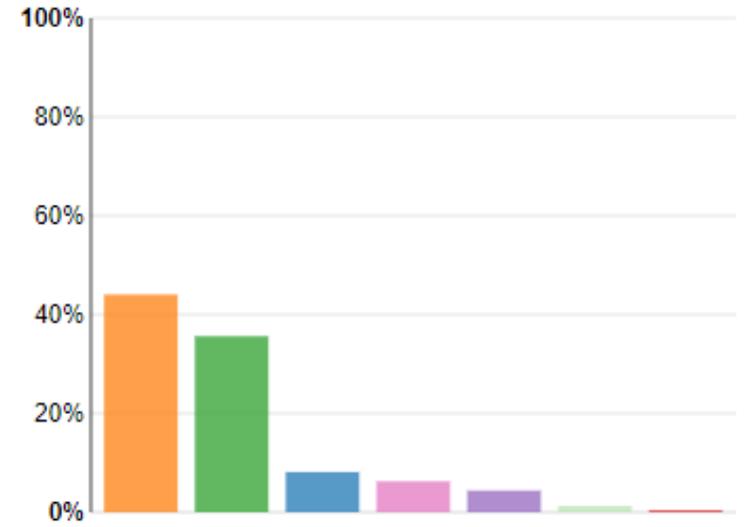
French



Dutch



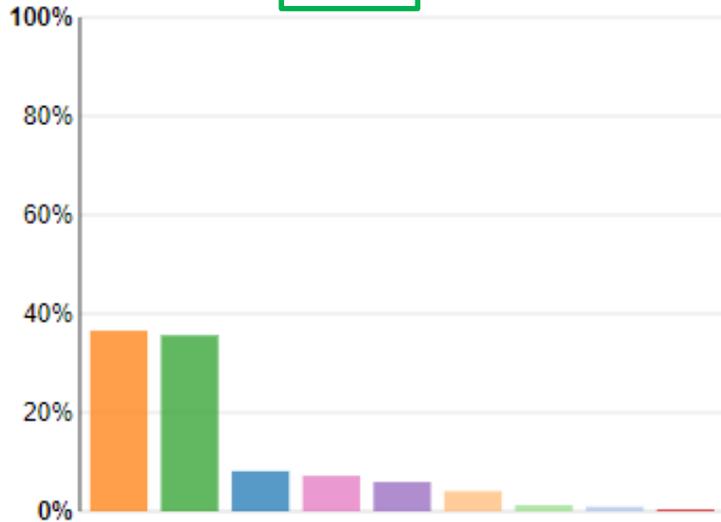
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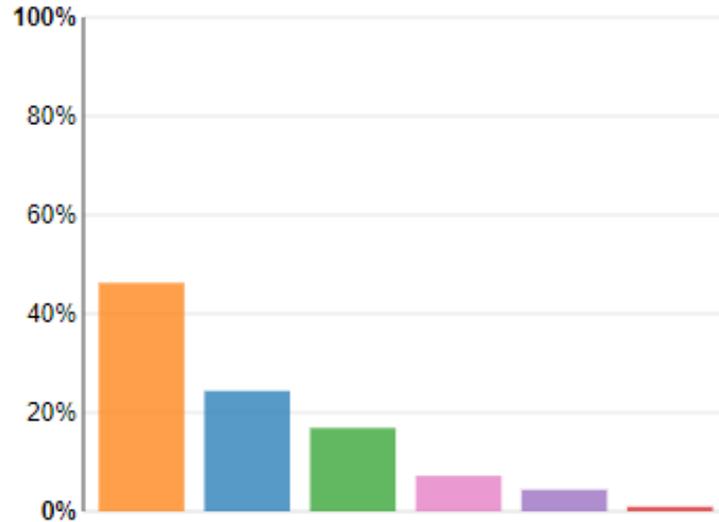
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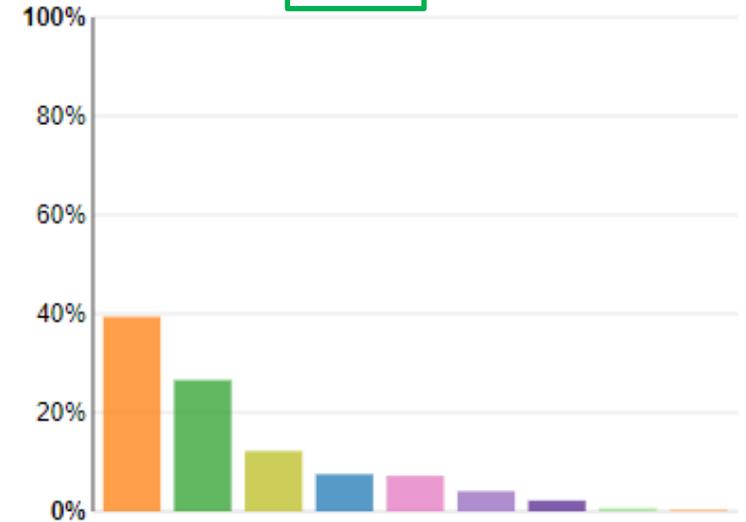
English



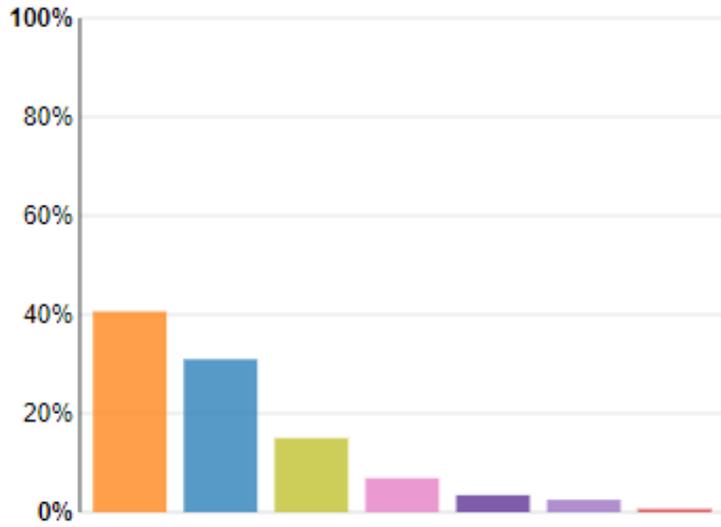
German



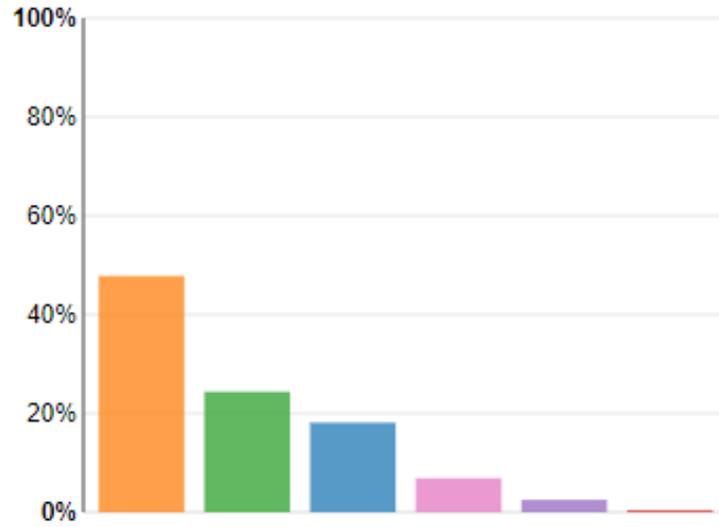
Spanish



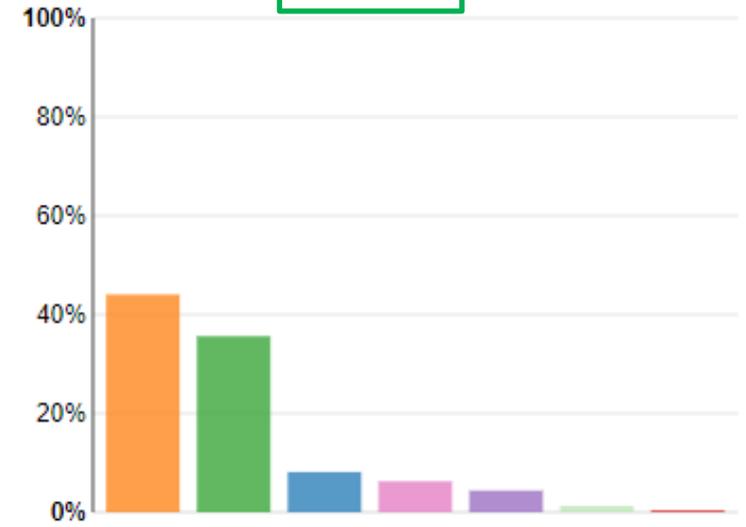
French



Dutch



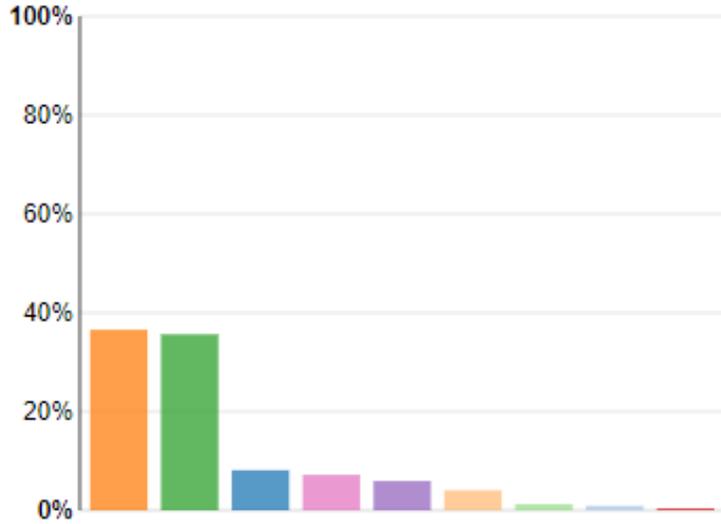
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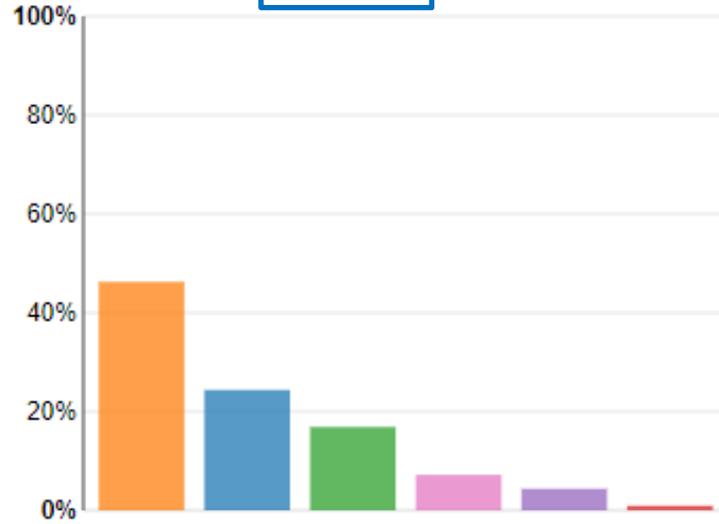
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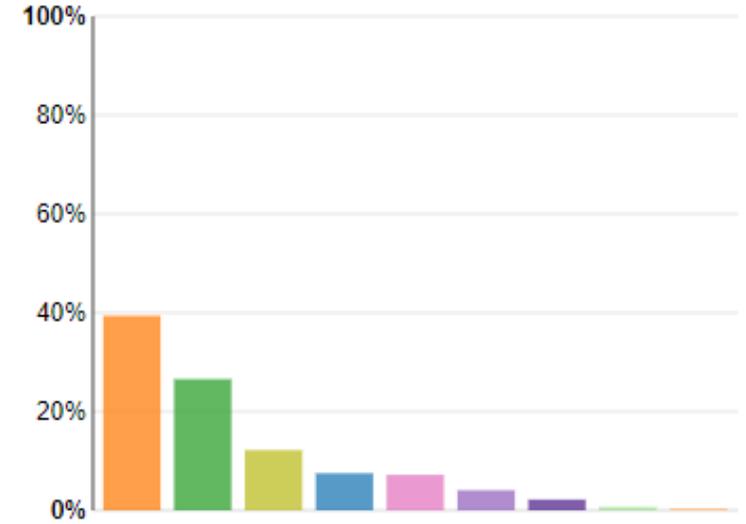
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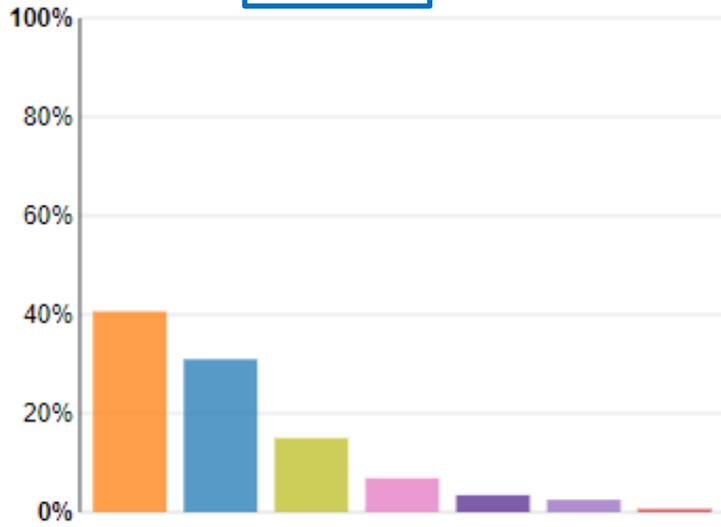
German



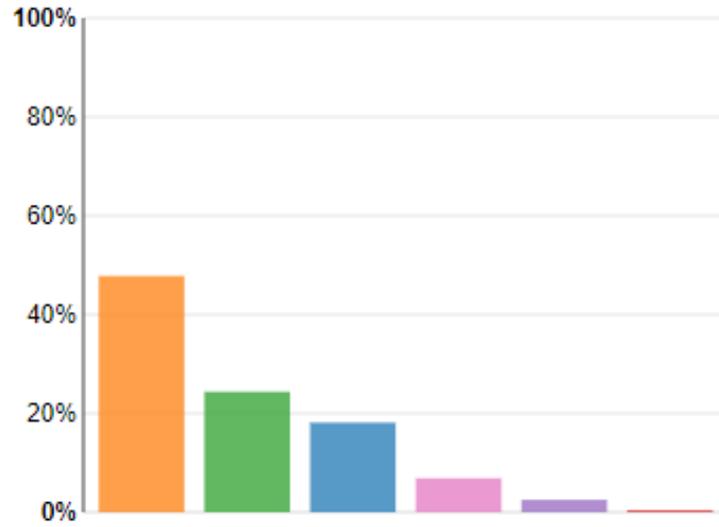
Spanish



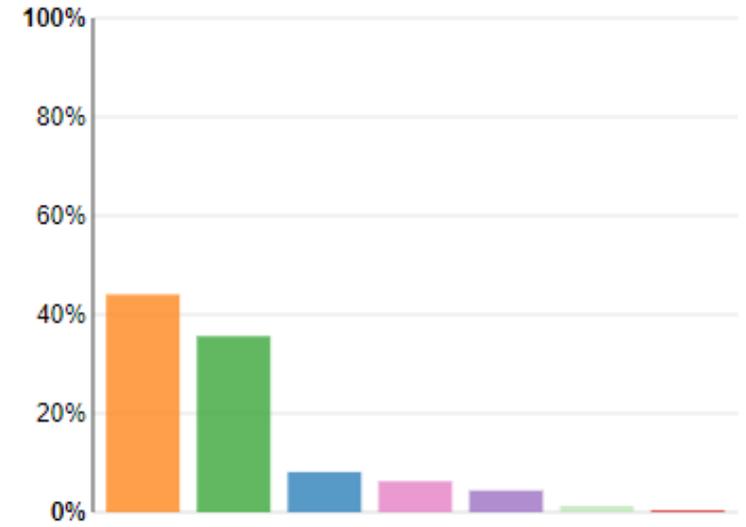
French



Dutch



Swedish



Tense distribution in dialogue: verb forms per language

English

Label	Count
simple present	117
simple past	114
present perfect	26
imperative	23
simple future	19
present continuous	13
past continuous	4
present perfect continuous	3
past perfect	1

German

Label	Count
Präsens	148
Perfekt	78
Präteritum	54
Imperativ	23
Futur I	14
Plusquamperfekt	3

Spanish

Label	Count
presente	126
pretérito indefinido	85
pretérito imperfecto	39
pretérito perfecto compuesto	24
imperativo	23
futuro imperfecto	13
futuro próximo	7
estar (imperfecto) + gerundio	2
estar (presente) + gerundio	1

French

Label	Count
présent	130
passé composé	99
imparfait	48
impératif	22
futur proche	11
futur simple	8
plus-que-parfait	2

Dutch

Label	Count
ott	153
ovt	78
vtt	58
imperatief	22
ottt	8
vvt	1

Swedish

Label	Count
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imperfekt	114
perfekt	26
imperativ	20
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supinum	4
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Tense distribution in dialogue: verb forms per language

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Frequency data: narrative discourse

- The dominant colour in the discourse charts is green: stories are told in the PAST tense (Fleischman 1990).
- Germanic languages use the SIMPLE PAST.
- Romance languages alternate between PERFECTIVE/IMPERFECTIVE PAST.
- PAST tense shows up in combination with dark red (PAST PERFECT).

Frequency data: dialogue

- The dominant colour in the dialogue charts is orange (PRESENT).
- Cross-linguistic stability: dialogue is anchored in the here and now (PRESENT), looking forward to the future (FUTURE) and looking backward to the past.
- Cross-linguistic variation in looking backward to the past:
 - Languages like French and German are PERFECT oriented,
 - languages like English, Swedish and Spanish are PAST oriented.
 - Dutch is somewhere in the middle.

Association between tense use and register

- Statistical association tests show that there is a correlation between register and tense use.
- Tense use is significantly different between narrative discourse and dialogue.

Language	df	χ^2	<i>p</i>	Cramér's <i>V</i>
English	2	88.57	< 0.001	0.39
Swedish	2	95.84	< 0.001	0.39
Spanish	3	85.16	< 0.001	0.37
Dutch	2	224.04	< 0.001	0.61
German	2	314.68	< 0.001	0.72
French	3	420.98	< 0.001	0.82

Association between tense use and register

- Tense use is significantly different between narrative discourse and dialogue.
- Effect size is bigger in more PERFECT oriented languages than in more PAST oriented languages.

Language	df	χ^2	<i>p</i>	Cramér's <i>V</i>
English	2	88.57	< 0.001	0.39
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French	3	420.98	< 0.001	0.82



Conclusions on frequency

- PRESENT, PRESENT PERFECT and FUTURE tenses do not appear in the discourse part of HP, exclusively in dialogue.
- The association tests show that the correlation with register is statistically significant in all languages in the dataset.
- One author, one translator per language, so this is intraspeaker variation, related to register.
- General meaning ingredient of the tense-aspect grammar of Western European languages.



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Analysis of tense use in narrative discourse

Tense use in narrative discourse

- We can use the HP dataset to test predictions from the literature (DRT/SDRT) on tense use in narrative discourse.

Tense use in narrative discourse (English)

- Predictions from the literature (DRT/SDRT): aspectual class.
- Predictions from the literature (DRT/SDRT): temporal structure at the discourse level:
 - Event sentences in the *Simple Past* report a sequence of events (forward movement of story time, Narration).
 - No forward movement of narrative time with stative sentences in the *Simple Past* or sentences in the *Past Progressive* describing an ongoing process (temporal overlap, Background).

Tense use in the narrative discourse parts of HP (English)

DRT/SDRT predictions for lexical aspect and temporal relations at the discourse level are borne out by the distribution of verb forms in *Harry Potter and the Philosopher's Stone* (English original).

At half past eight, Mr Dursley *picked* up his briefcase, *pecked* Mrs Dursley on the cheek and *tried* to kiss Dudley goodbye but *missed*, because Dudley *was now having* a tantrum and *throwing* his cereal at the walls.



Distributional patterns in other languages (French)

- Predictions from the literature (DRT/SDRT): temporal structure at the discourse level.
 - A series of sentences in the *Passé Simple* reports a sequence of events (forward movement of story time, Narration)
 - No forward movement of narrative time with sentences in the *Imparfait* (temporal overlap, Background)

Tense use in the narrative discourse parts of HP (French)

DRT/SDRT predictions for lexical aspect and temporal relations at the discourse level are borne out by the distribution of verb forms in *Harry Potter and the Philosopher's Stone* (French translation).

At half past eight, Mr Dursley *picked* up his briefcase, *pecked* Mrs Dursley on the cheek and *tried* to kiss Dudley goodbye but *missed*, because Dudley *was now having* a tantrum and *throwing* his cereal at the walls.

A huit heures et demie, Mr Dursley *prit* son attaché-case, *déposa* un baiser sur la joue de Mrs Dursley et *essaya* d'embrasser Dudley, mais sans succès, car celui-ci *était* en proie à une petite crise de colère et *s'appliquait* à jeter contre les murs de la pièce le contenu de son assiette de céréales.

Conclusions about HP narrative discourse

- The PAST tense dominates in the narrative discourse parts of *Harry Potter*.
- The alternation between *Simple Past/Past Progressive* confirms claims from the DRT/SDRT literature on English.
- The alternation between *Passé Simple/Imparfait* confirms claims from the DRT/SDRT literature on French.

From narrative discourse to dialogue

- The alternation between *Simple Past/Past Progressive* confirms claims from the DRT/SDRT literature on English.
- The alternation between *Passé Simple/Imparfait* confirms claims from the DRT/SDRT literature on French.
- The narrative dataset validates the *Translation Mining* methodology.
- *Translation Mining* is a promising methodology to investigate tense use in dialogue.



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Analysis of tense use in dialogue

Tense use in dialogue

- Absence PRESENT, PRESENT PERFECT and FUTURE tenses do not appear in the discourse parts of HP, exclusively in dialogue.
- General meaning ingredient of the tense-aspect grammar of Western European languages.
- Hypothesis: the PRESENT, PRESENT PERFECT and FUTURE are tense-aspect categories that belong to the spoken language grammar.

Fictional dialogue as a proxy for spoken language

- Direct speech in written dialogue contains features found in spoken language: vocatives (*Potter, come here!*), interactional particles (*well*), hesitations *I-I*.
- The quotations in written direct speech mirror pauses in spoken direct speech (oral story telling).

Well? said Quirrell impatiently. *'What do you see?'*

Quirrell rounded on Harry.

'Yes - Potter - come here.'

Harry screwed up his courage.

'I see myself shaking hands with Dumbledore,' he invented

'I - I've won the House Cup for Gryffindor.'

- 1st/2nd person pronouns anchor to speaker/addressee in the story.

Fictional dialogue as a proxy for spoken language

- Direct speech in written dialogue cannot be fully identified with real life conversation.
- More modest hypothesis: the grammar of indexicals in direct speech is the same as the grammar of indexicals in conversation.
- The grammar of indexicals includes 1st/2nd person pronouns as well as PRESENT, PRESENT PERFECT and FUTURE tenses.
- Tense use in dialogue requires an indexical analysis.

Literature on indexicals

- Tense use in dialogue requires an indexical analysis.
- Literature on indexicals:
 - pronouns (*I, you*, demonstrative use of *he/she*),
 - displaced *now* (Kamp & Rohrer 1983, Hunter 2012, Stojnić & Altshuler 2021).

At half past eight, Mr Dursley *picked* up his briefcase, *pecked* Mrs Dursley on the cheek and *tried* to kiss Dudley goodbye but *missed*, because Dudley *was now having* a tantrum and *throwing* his cereal at the walls.

Tense as a deictic category

- Tense is inherently deictic: all tenses depend for their interpretation on the speech time (Comrie 1976, 1985).

Speech time, event time, reference time

- Tense is inherently deictic: all tenses depend for their interpretation on the speech time (Comrie 1976, 1985).
- Reichenbach (1947): event time (E), reference time (R), speech time (S).
- English:
 - *Simple Present* E,R,S
 - *Simple Past* E,R-S
 - *Present Perfect* E-R,S
 - *Future* S,R-E

Mixed deictic/anaphoric category

- Partee (1973, 1984): the PAST tense in narrative discourse is anaphoric:
 - forward movement of story time in sequence of events,
 - temporal overlap for states.
- Dynamic use of reference time in DRT (Kamp & Rohrer 1983, Kamp & Reyle 1993).
- PAST tense combines deictic and anaphoric meaning ingredients.

PAST tense and 3rd person pronouns

- PAST tense combines deictic and anaphoric meaning.
- PAST tense similar to 3rd person pronoun:
 - Deictic/demonstrative use: pointing to a referent in the extra-linguistic context (☞ 'He did it.')
 - Anaphoric use: antecedent in the linguistic context.
(*'Bert_i is such a nice guy, he_i is always ready to help.'*)
- 3rd person pronoun and PAST tense are mixed indexical /anaphoric categories.

'Pure' indexicals

- PAST tense similar to 3rd person pronoun.
- **Hypothesis**: PRESENT, PRESENT PERFECT and FUTURE similar to 1st/2nd person pronouns.
- *I* and *you* are 'pure' indexicals:
 - always anchor to extra-linguistic situation
 - no anaphoric interpretation.
 - modulo 'monsters': 1st person pronouns in Amharic shift to speaker reference in embedded speech acts (Schlenker 2003).

'Pure' indexicals and mixed categories

- Hypothesis:
 - PRESENT, PRESENT PERFECT and FUTURE tenses are 'pure' indexicals (appear exclusively in dialogue)
 - PAST and PAST PERFECT are mixed indexical/anaphoric expressions (appear in discourse and dialogue).

Literature: two indexical theories

- Two-dimensional theories of indexicals inspired by Kaplan (1989):
 - indexical expressions acquire rigid reference by anchoring to the extra-linguistic context.
 - anaphoric expressions are interpreted as dependent on antecedents in the linguistic context.
- One-dimensional theories of indexicals.

Two types of theories for indexicals

- Two-dimensional theories of indexicals (Kaplan 1989).
- One-dimensional theories of indexicals: Hunter & Asher (2005), Maier (2006, 2009), Hunter (2012, 2013, 2014):
 - Avoid lexical ambiguity of 3rd person pronouns;
 - Treat indexicals as anaphoric, presuppositional expressions;
 - Different mechanisms of anaphora resolution for anchoring to parameters of the utterance situation or linguistic context.

Towards an indexical theory of tense

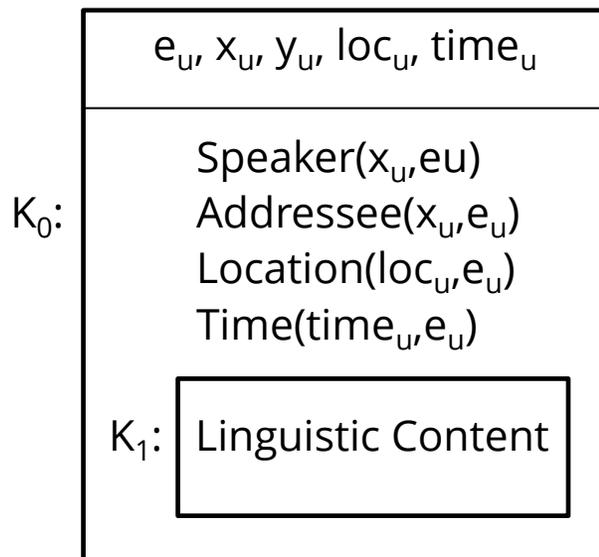
- Two-dimensional theories: suitable for 'real life' conversation.
- One-dimensional theories: easier to extend to fiction.
 - Mixture of discourse and dialogue;
 - Linguistic anchoring of indexicals in dialogue.
 - Implemented in DRT, so easier to integrate with DRT/SDRT theories on tense and aspect.

dialogue	discourse	dialogue
'You <u>can</u> 't blame them,'	<u>said</u> Dumbledore gently	'We've <u>had</u> precious little to celebrate for eleven years'

Towards an indexical theory of tense

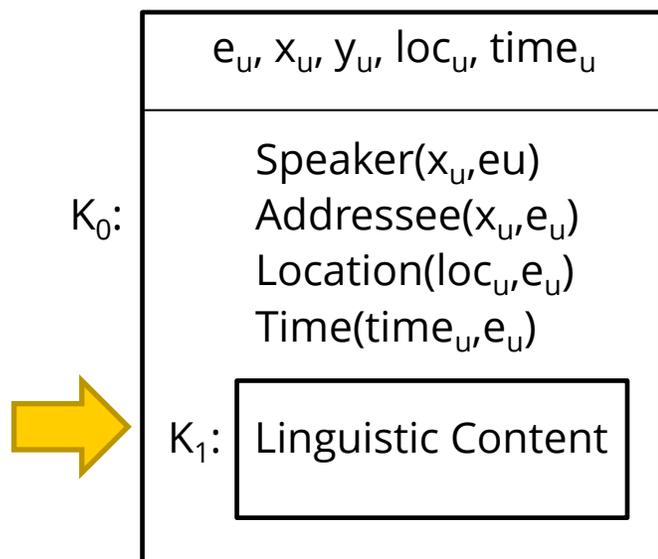
- Build on Hunter's one-dimensional indexical theory of pronouns (Hunter 2013, 2014).
 - Key features of Hunter's DRT analysis of indexicals.
 - Extended Hunter's analysis to tense.
 - Extend Hunter's analysis to fiction.
 - Specify for discourse
 - Specify for dialogue

Key features of Hunter's model



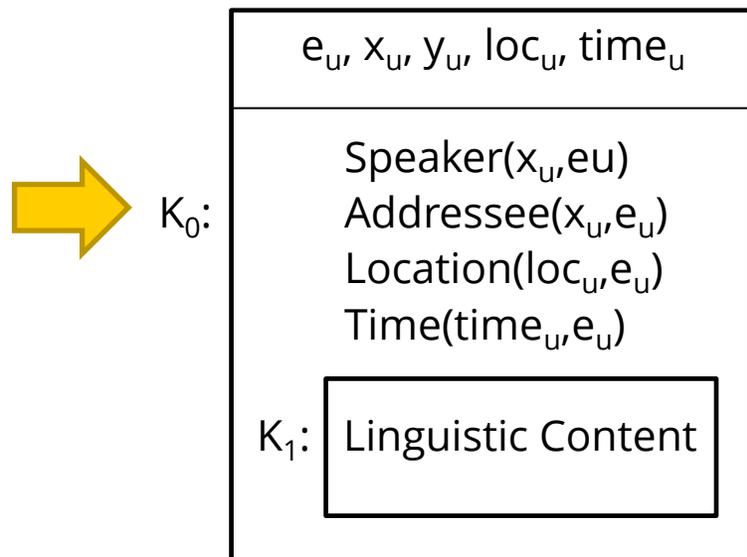
- Extended DRT framework: add K_0 as the highest level of the DRS.
 - No logical operator creating embedding;
 - But structured context.
- K_1 contain linguistic content
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 - K_0 contains parameters needed for the interpretation of the sentence
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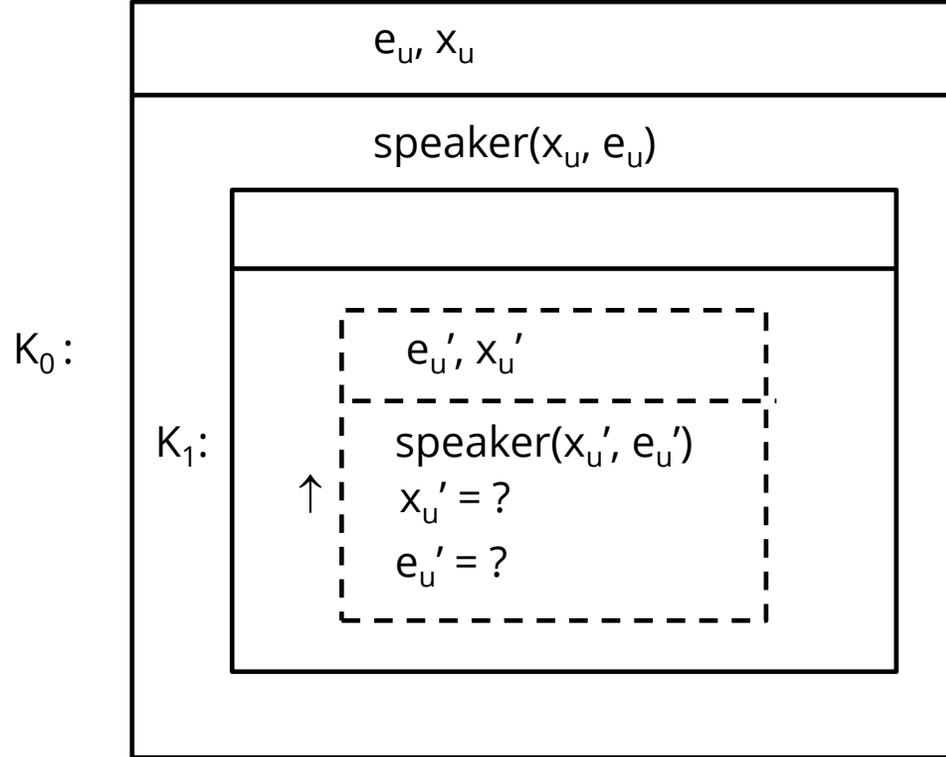


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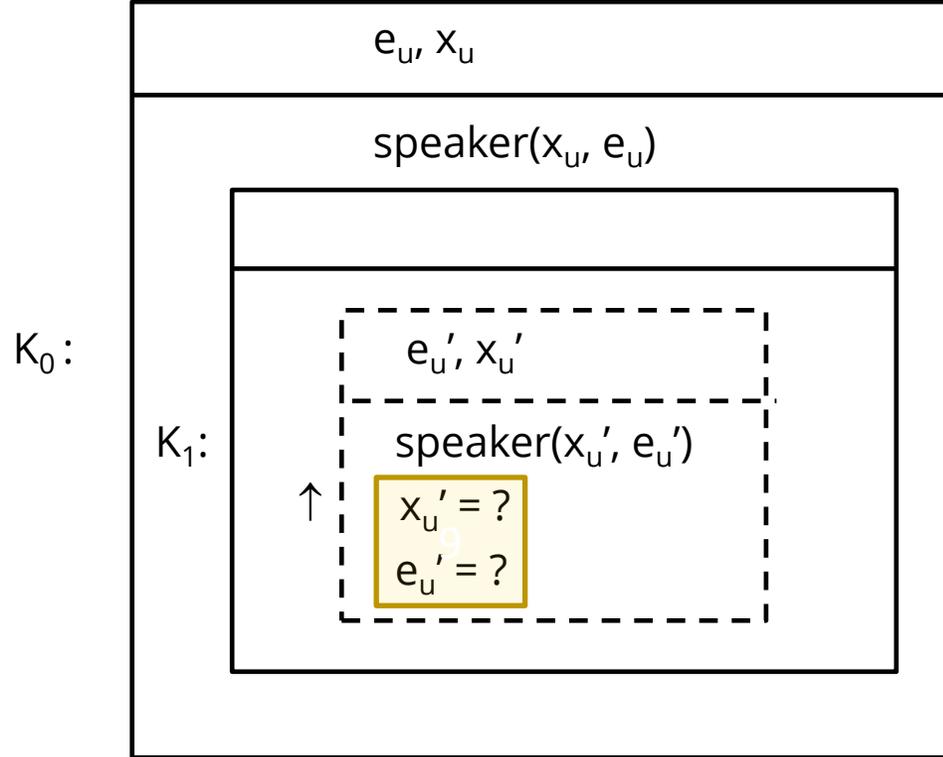
K_0 : extra-linguistic context.

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1st person pronoun introduces an anaphoric condition ($x=?$) under the scope of the \uparrow operator, in the presuppositional content of the DRS.

Dotted lines mark presuppositional content in K_1 .

Content embedded under \uparrow requires resolution at the highest level (K_0).



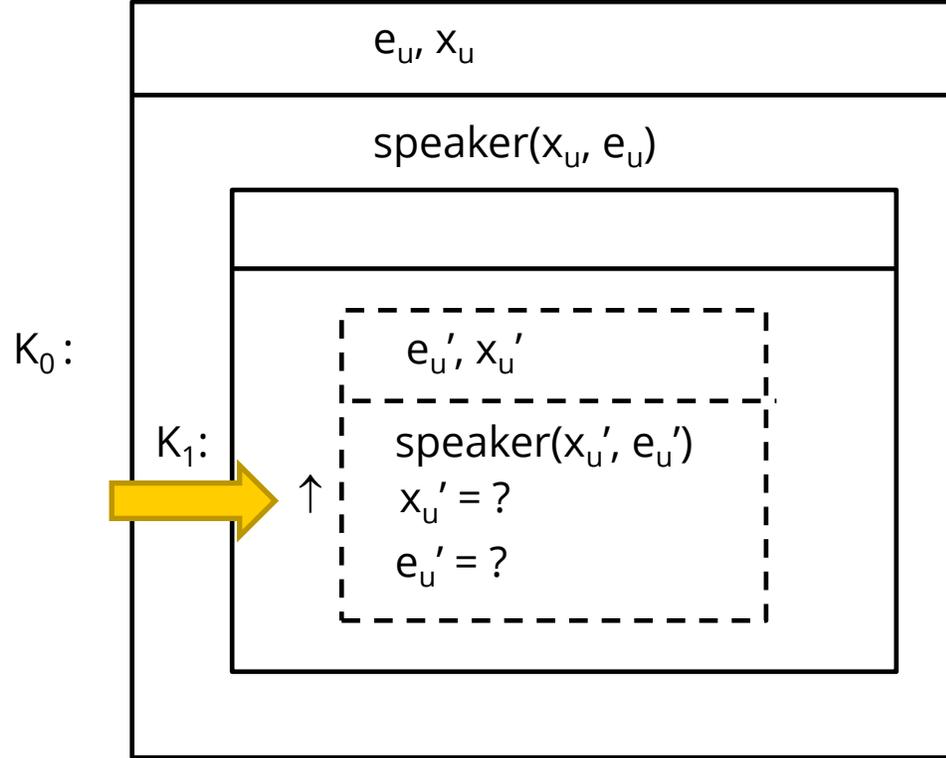
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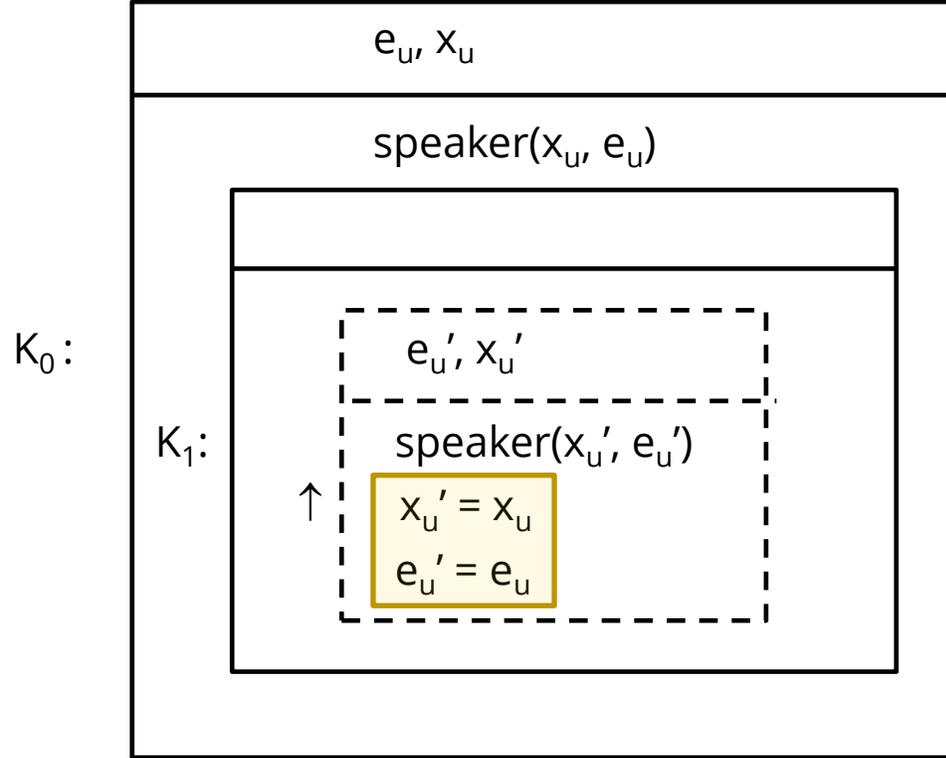
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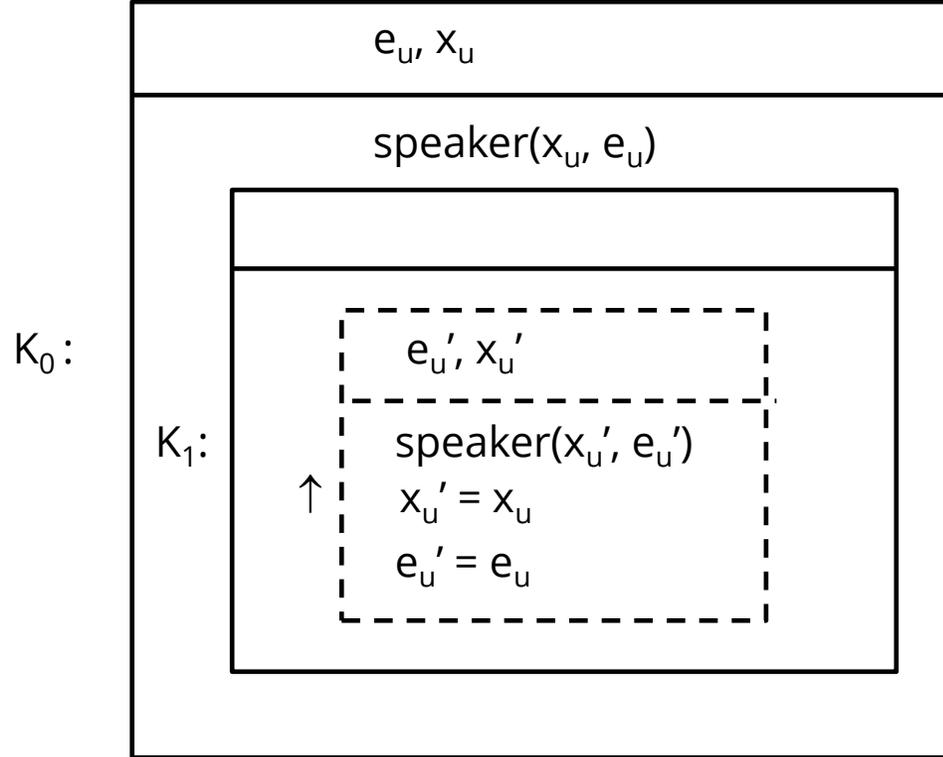
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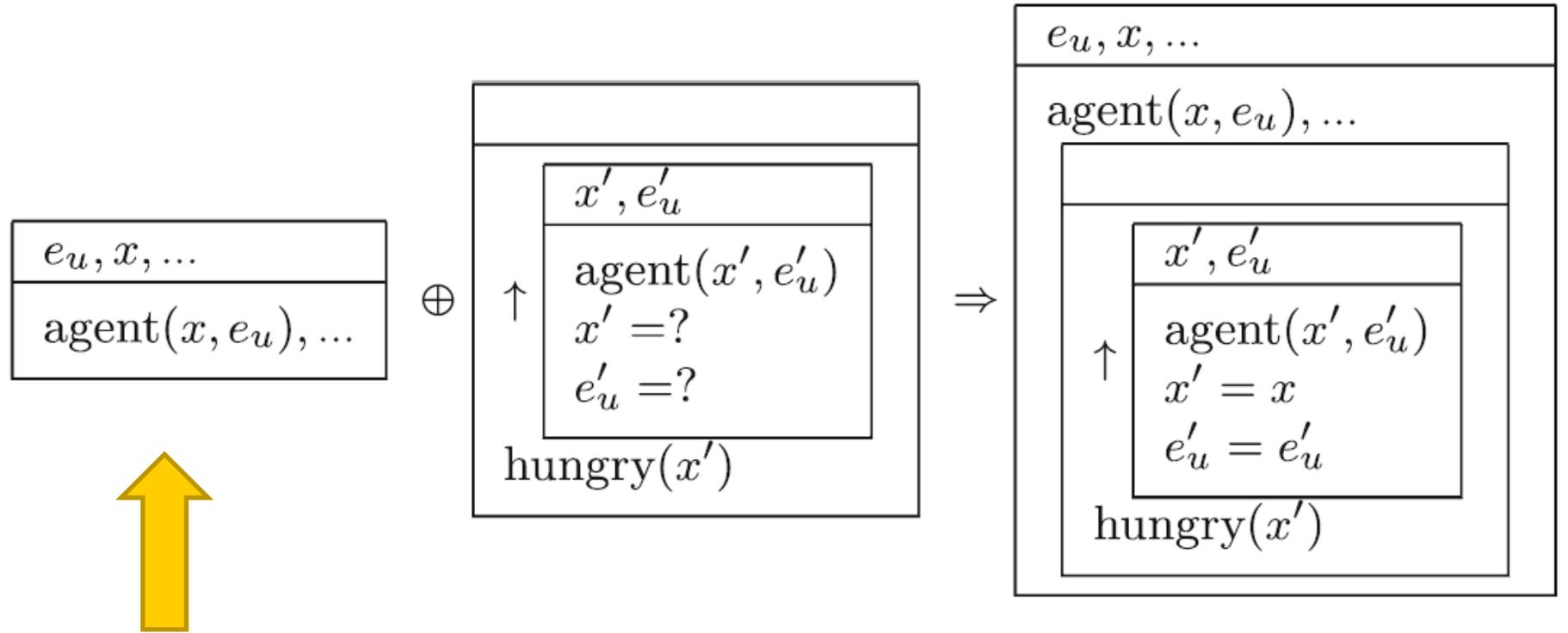
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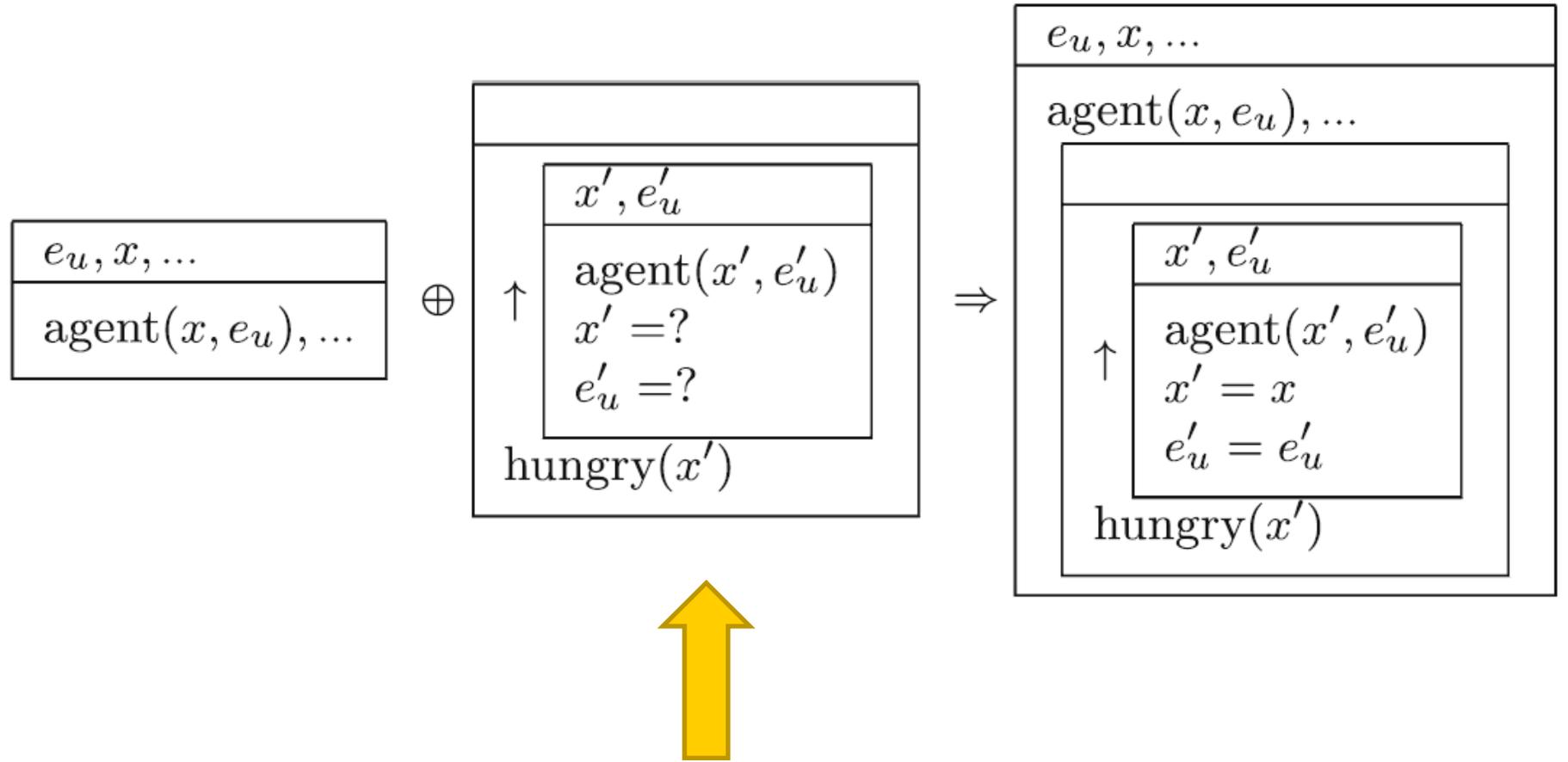
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Illustration:
I am hungry



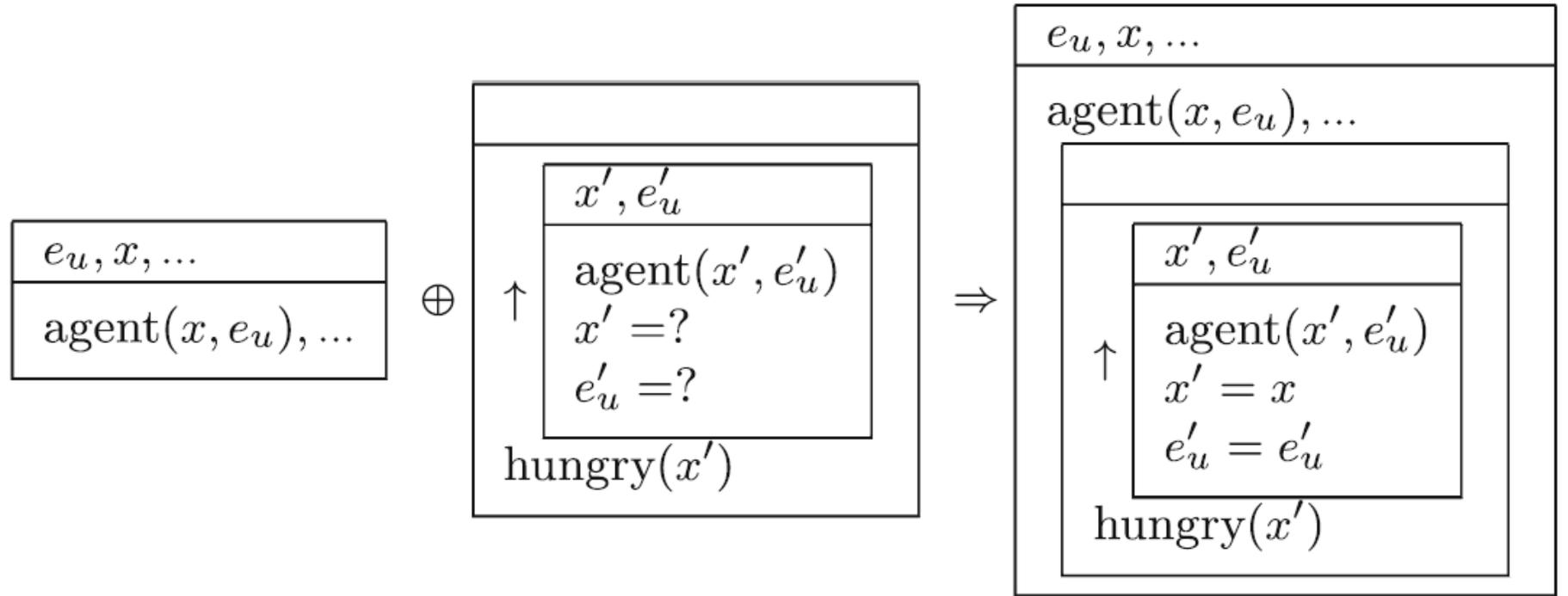
- Add a top level DRS which represents the utterance event e_u , with parameters speaker (agent of utterance event), addressee, etc. as the input context: K_0 .

Illustration:
I am hungry



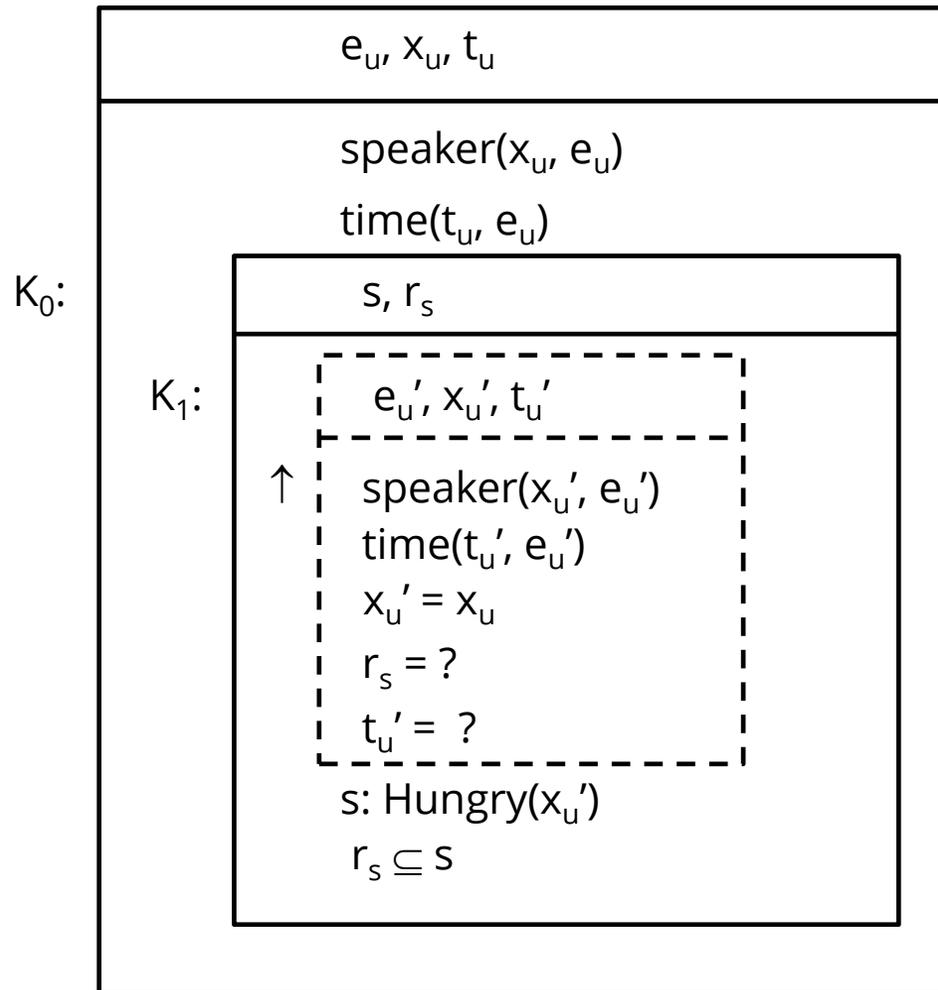
- Spell out conditions on descriptive content in K_1 .
- Spell out conditions on indexicals in a presuppositional DRS embedded in K_1 under the scope of \uparrow .

Illustration: *I am hungry*



- Merge K_0 (extralinguistic context) with K_1 (conditions on descriptive content and indexicals).
- The evaluation procedure of the DRS ensures anchoring to the extra-linguistic situation with rigid reference (details in Hunter 2013, 2014).
- The (one and only) agent of the utterance event is hungry.



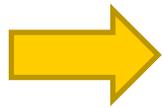


Extension of Hunter's model to tense.

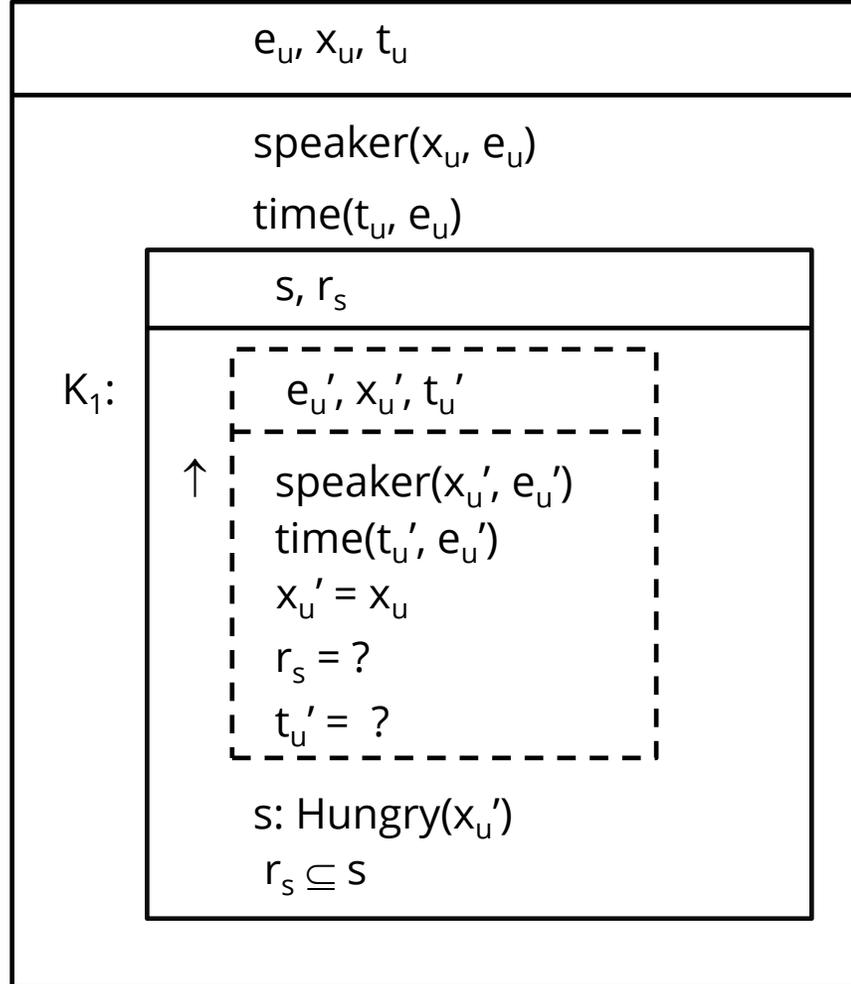
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I am hungry – after interpretation of the 1st person pronoun add the PRESENT tense.



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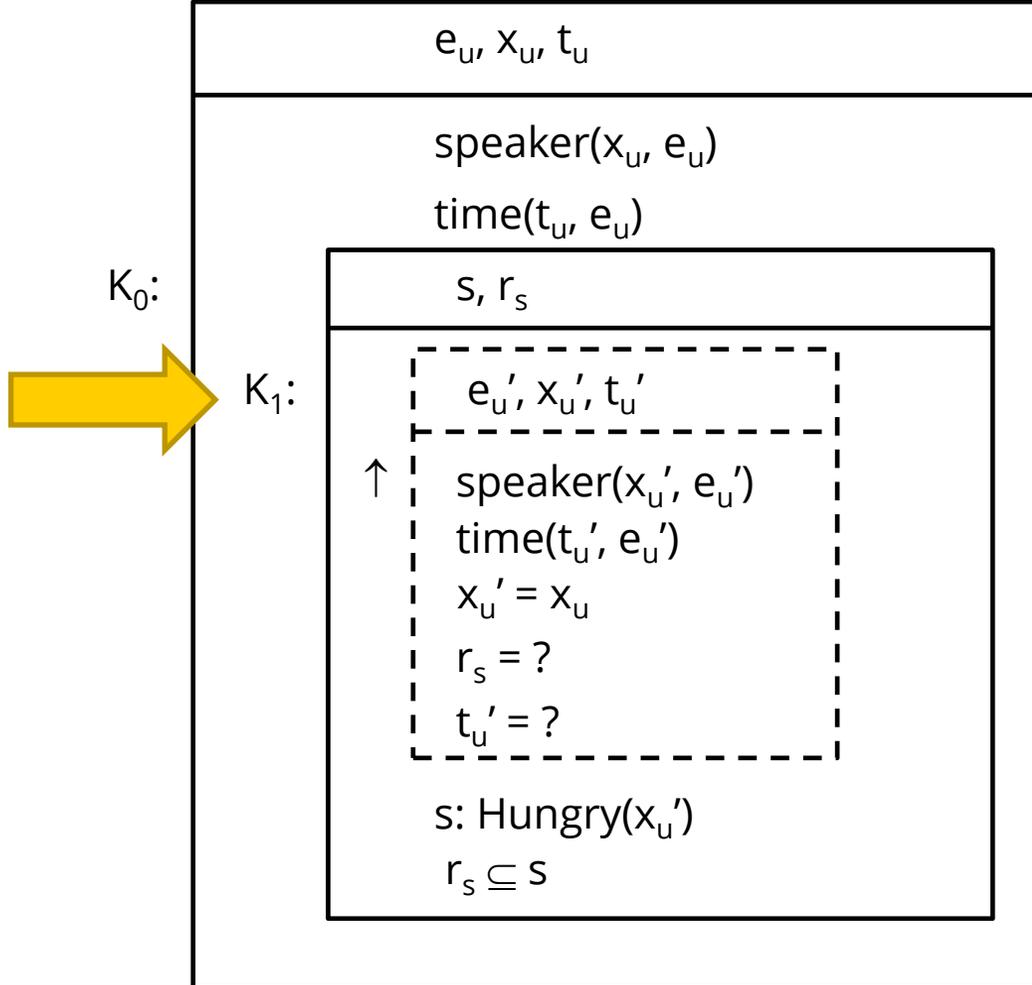


Extension of Hunter's model to tense in real life conversation.

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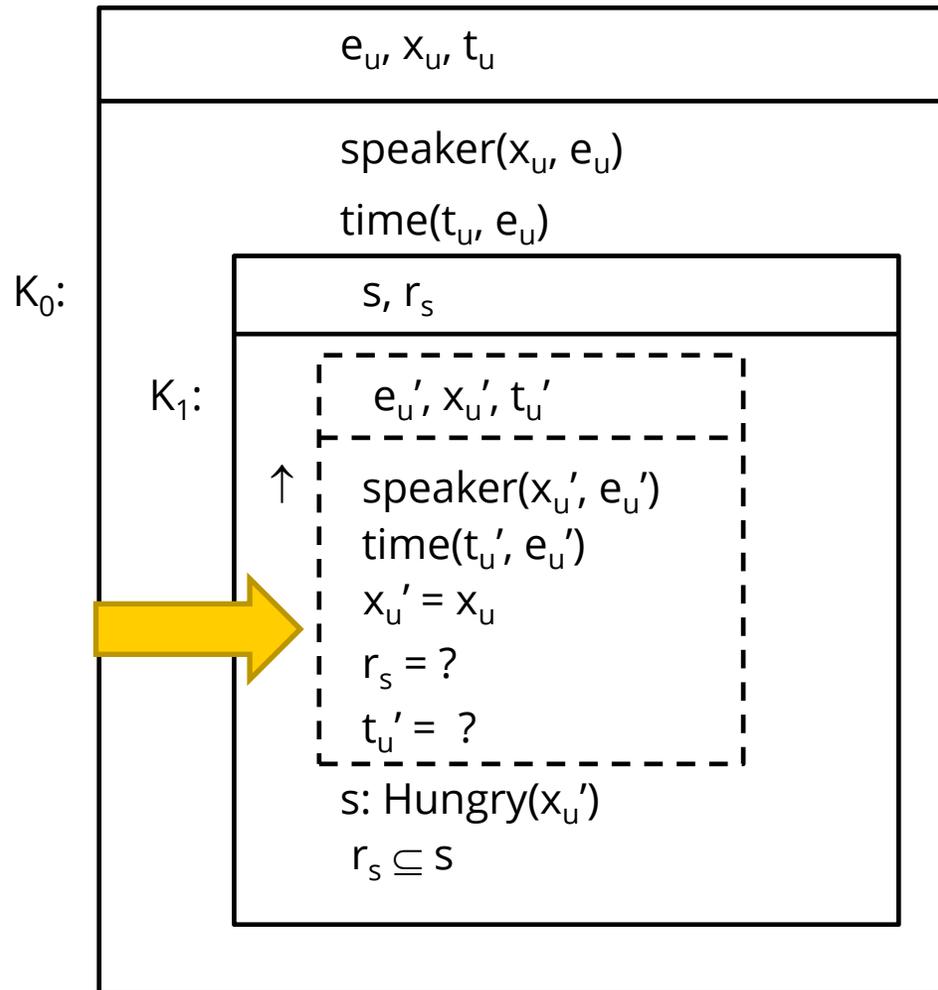
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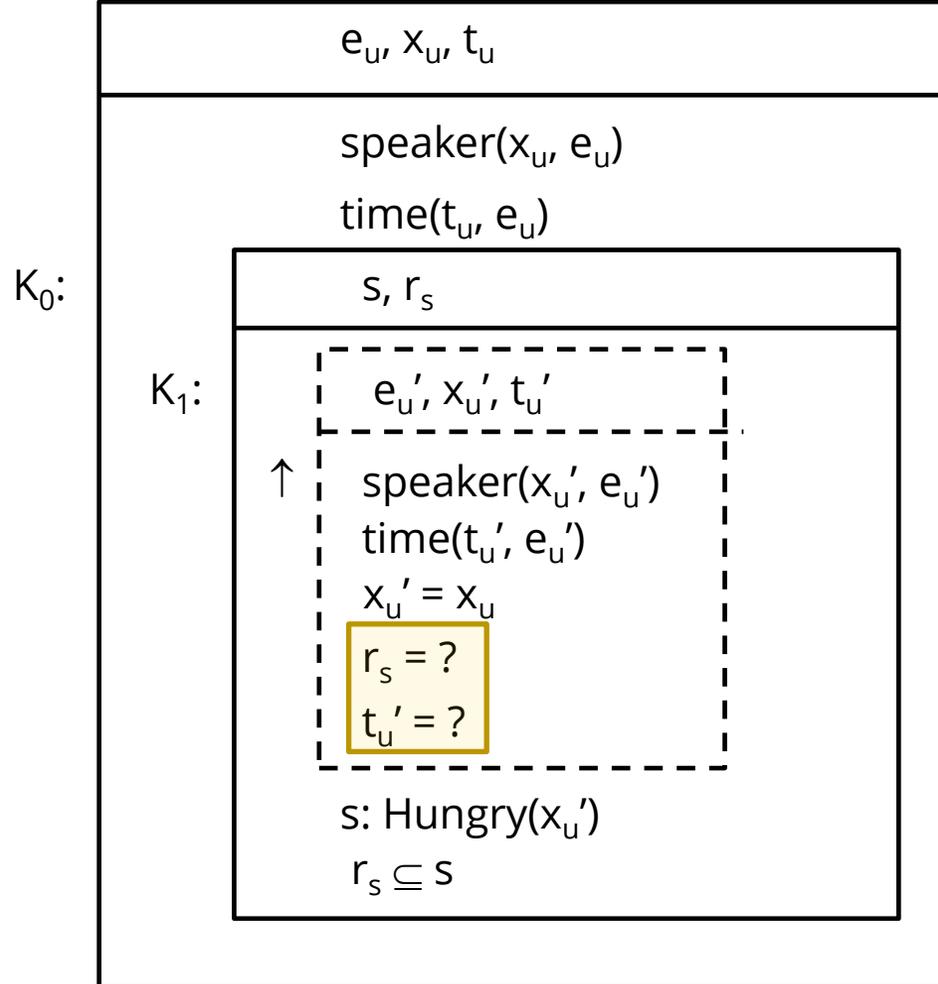


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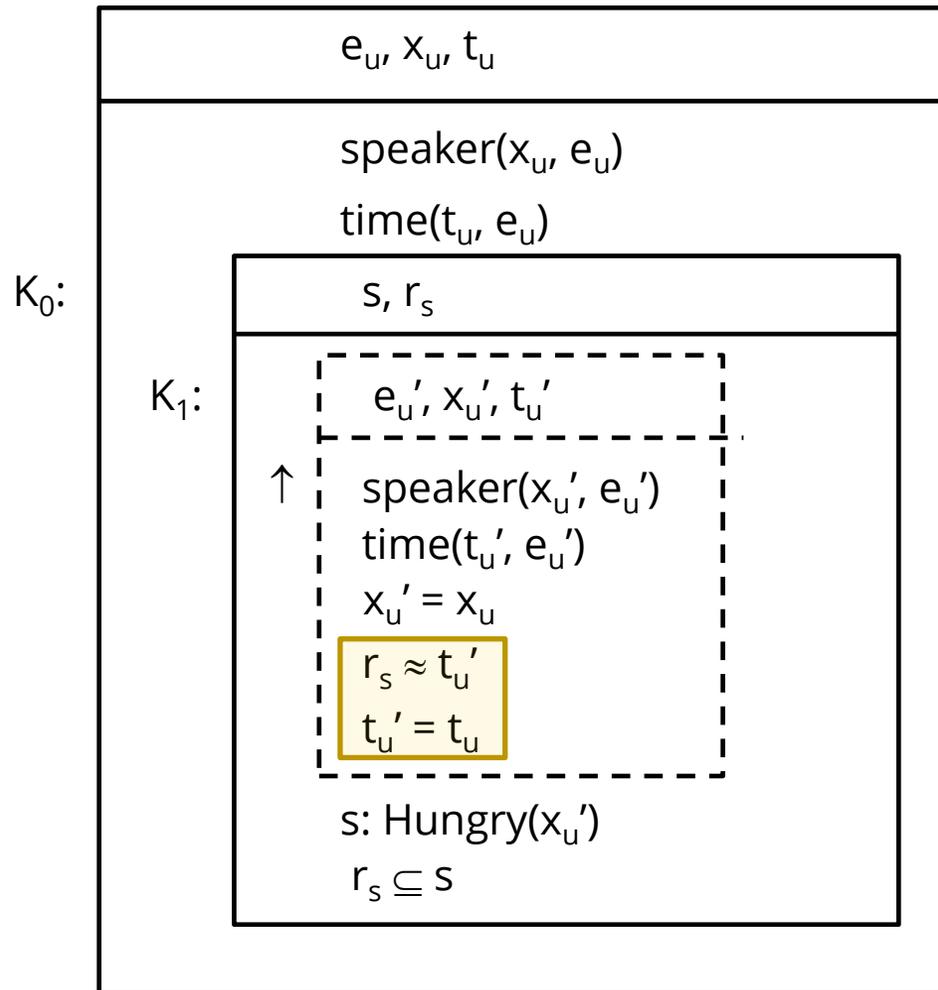


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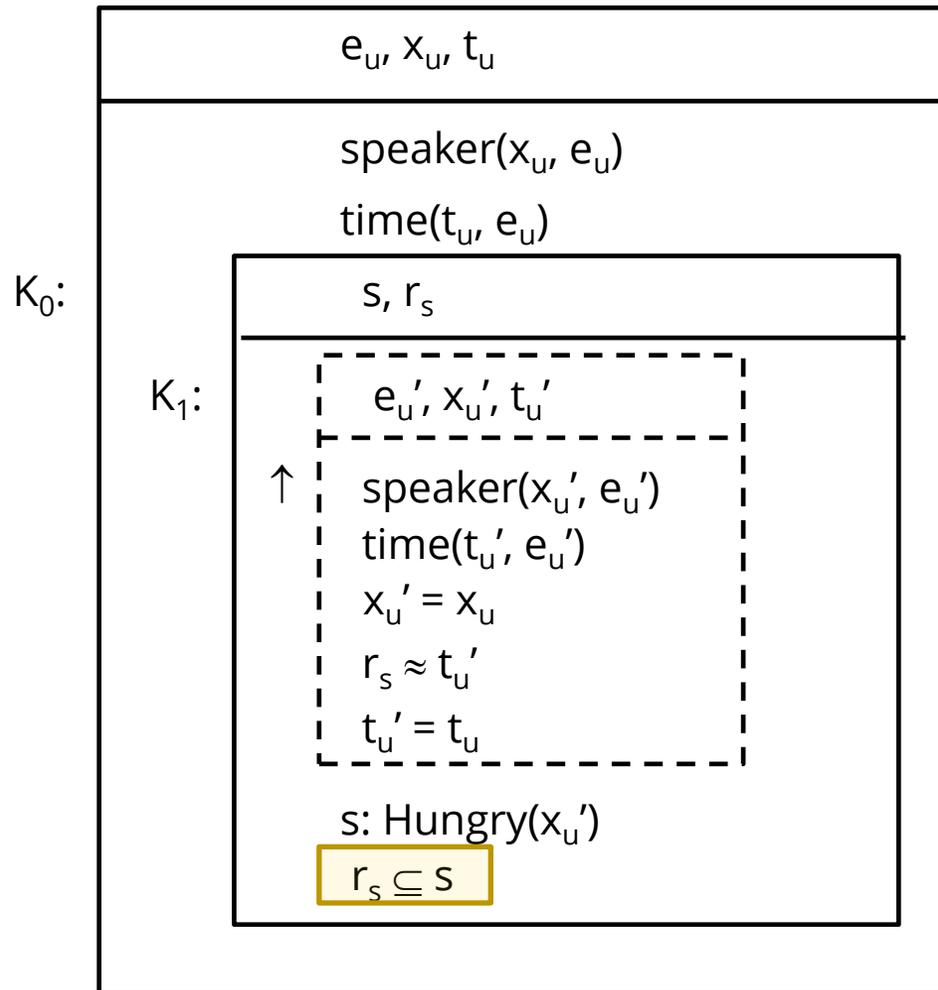
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Reichenbachian analysis of the PRESENT tense: R,S,E.

Indexical condition introduced by the PRESENT tense: reference time r seeks to establish an anaphoric relation with t'_u under the scope of \uparrow in K_1 .

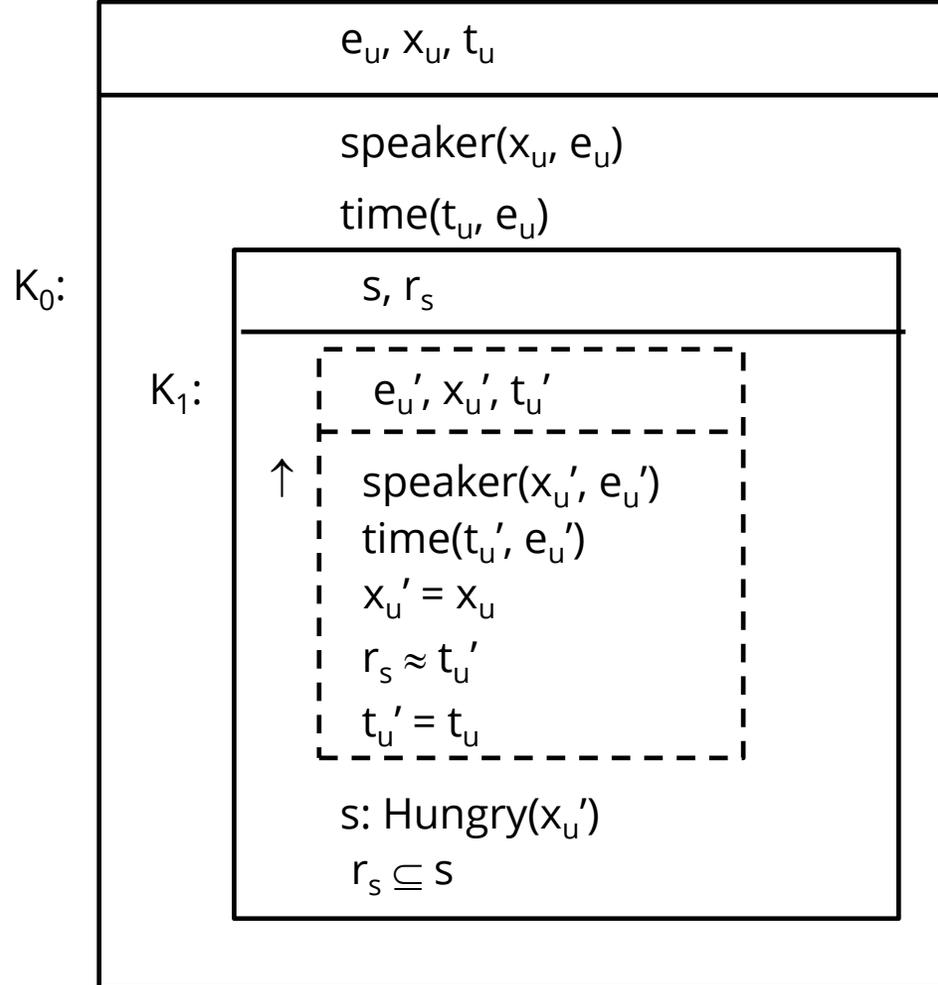
PRESENT tense: reference time r_s closely identifies (\approx) with t'_u in the presuppositional DRS of K_1 .



Indexical anaphora resolution of the PRESENT tense: t_u' in presuppositional DRS of K_1 identifies with the time t_u of the utterance event in K_0 (anchoring to extra-linguistic context).

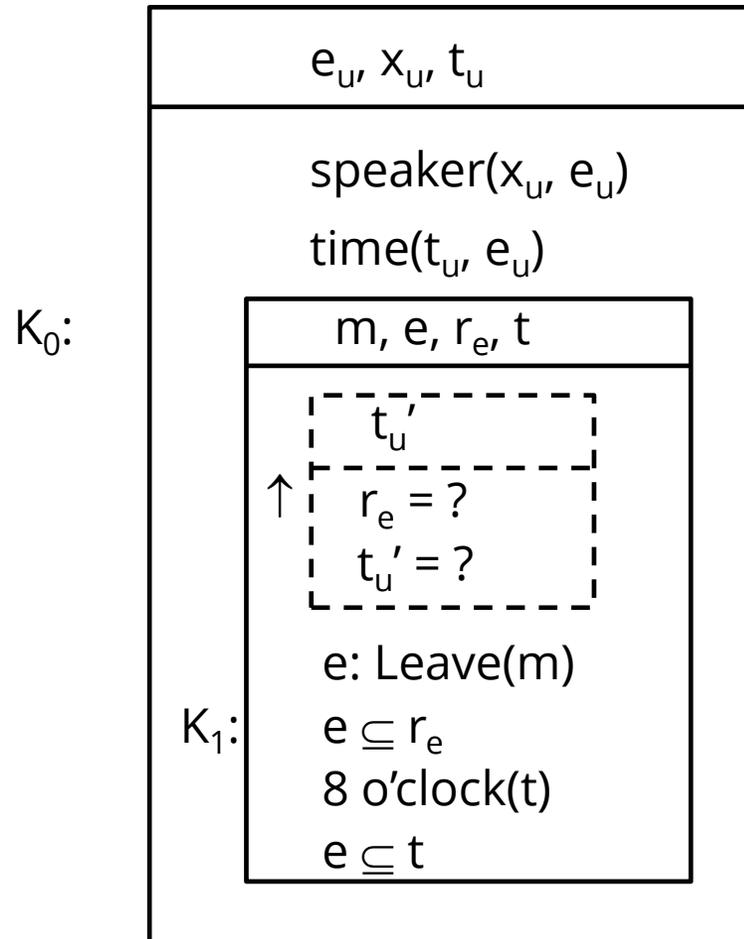
Role of aspect: event-based analysis as in DRT. Events are included in the reference time ($e \subseteq r$), states include the reference time ($r \subseteq s$).

I am hungry.



I am hungry: extension of Hunter's indexical theory of pronouns to tense.

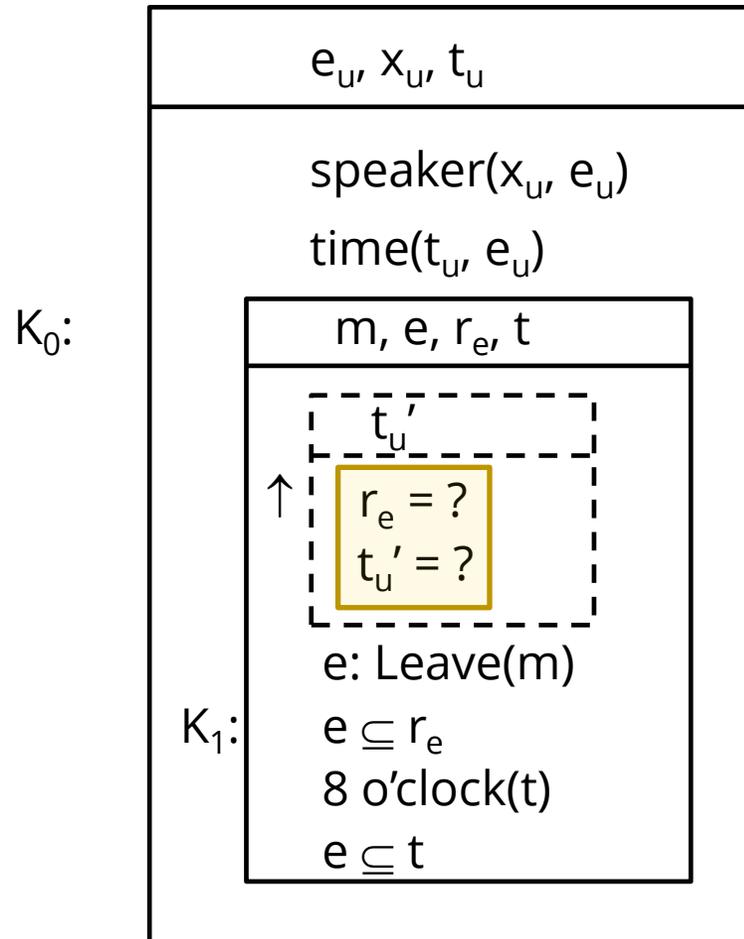
The speaker of the sentence is hungry at the utterance time.



Spoken language is not restricted to the present domain: we can talk about events in the past and the future as well.

Mary left the house at 8 o'clock – after standard interpretation of the predicate-argument structure, and the time adverbial in DRT, add the PAST tense.

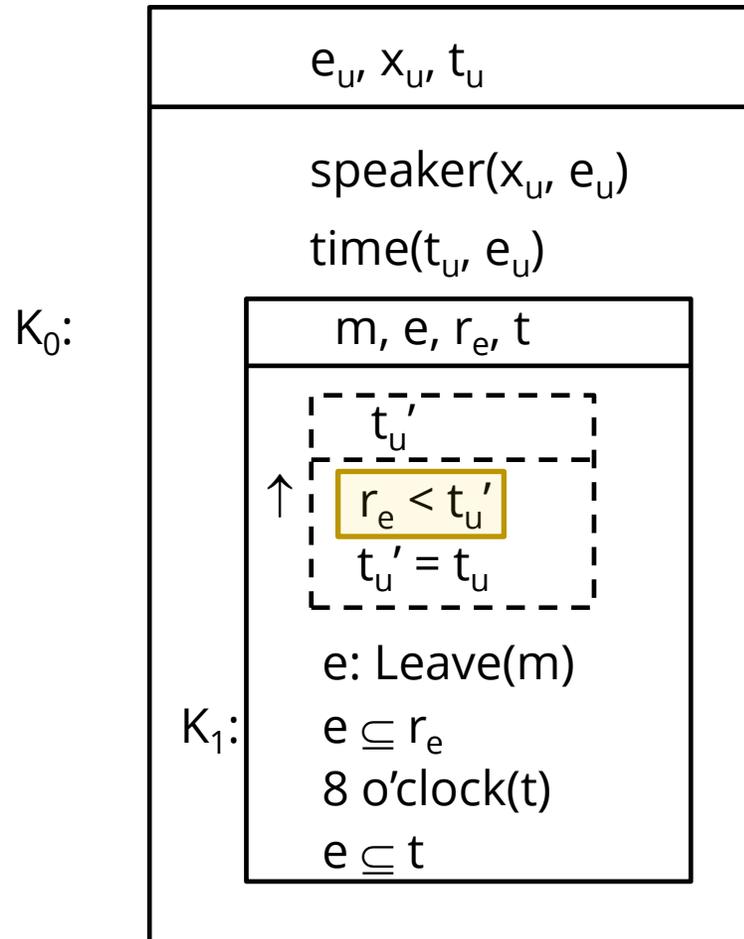
Tense is inherently deictic in the sense of Reichenbach: PAST tense also introduces an anaphoric condition under the scope of \uparrow .



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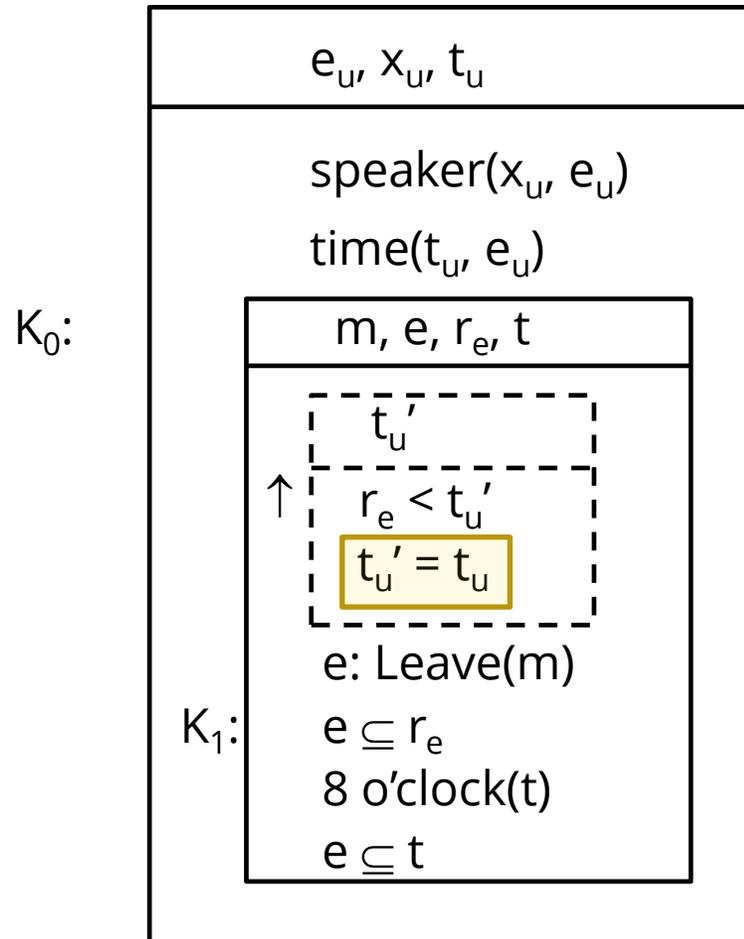


Mary left the house at 8 o'clock

PAST tense: reference time r_e precedes t_u' in presuppositional DRS in K_1 .

t_u' identifies with the speech time t_u in K_0 , so the leaving precedes the utterance event.

Event is included in the interval on the time axis introduced by the time adverbial.

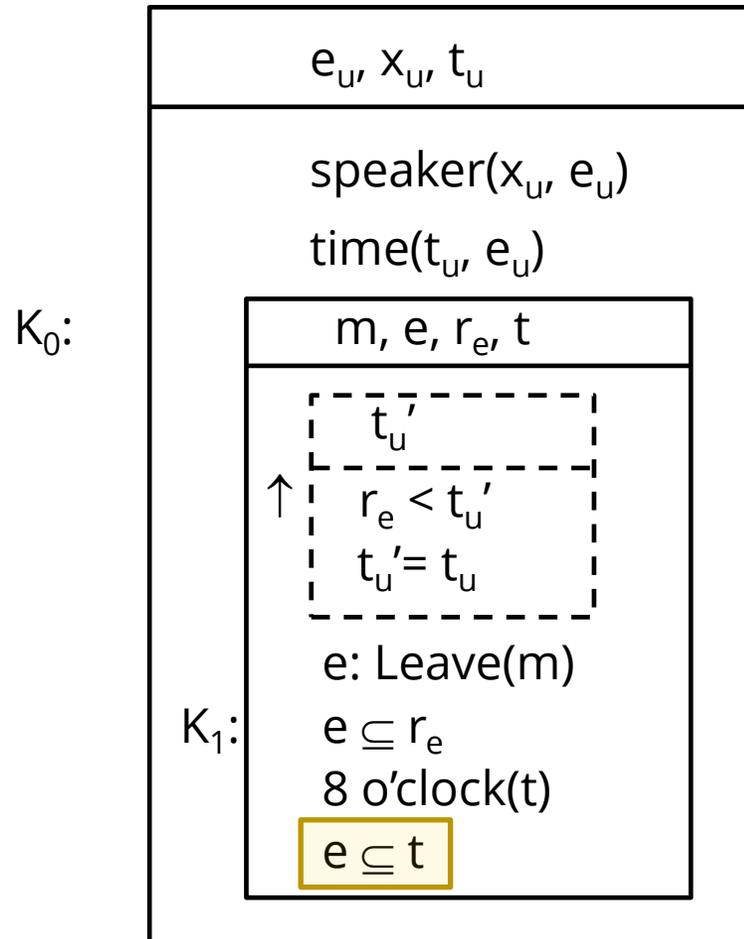


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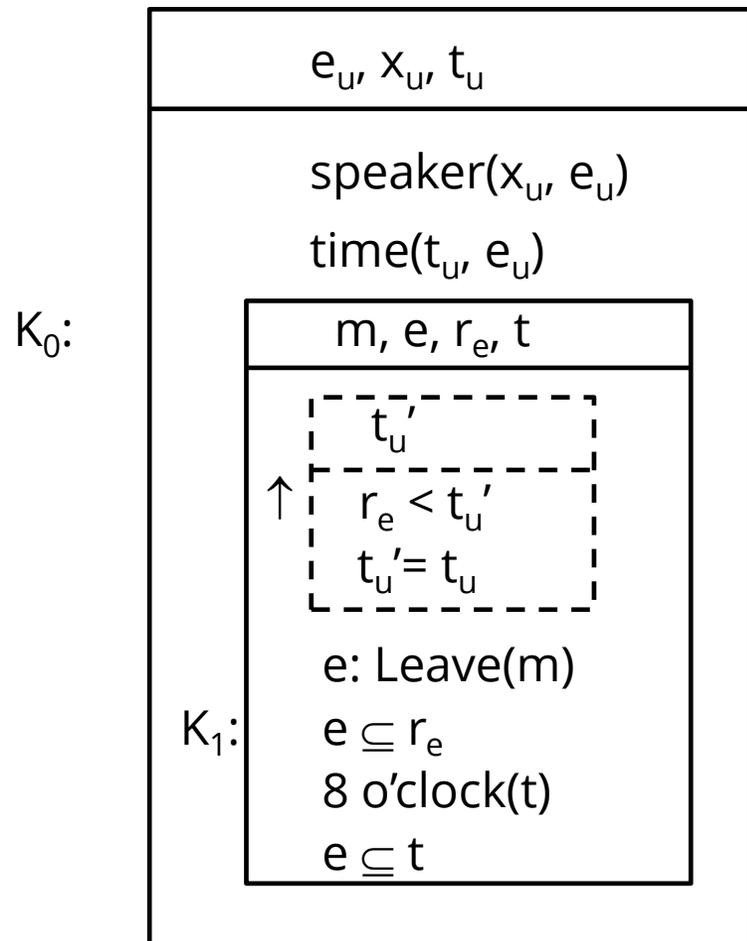


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Mary left the house at 8 o'clock.

Real life conversation: leaving event precedes the speech time.

From real life conversation to fiction

K_0 :

e_n, x_n, y_a, t_n
Narrator (x_n, e_n)
Audience (y_a, e_n)
Narration time (t_n, e_n)

- Discourse-initial context in fiction: K_0 refers to the process of narration as the fictional counterpart of the utterance event in real life conversation.

From real life conversation to fiction

K_0 :

e_n, x_n, y_a, t_n
Narrator (x_n, e_n)
Audience (y_a, e_n)
Narration time (t_n, e_n)

- The narrator x_n and audience y_a are the counterparts of speaker and hearer; the narration time t_n is the counterpart of the speech time.
- The narration parameters get rigid reference in the fictional world set up by the novel; handled through the evaluation procedure in Hunter (2013, 2014).

Visibility of narration process in discourse

Indexical expressions in narrative discourse render narrator, audience and narration time linguistically visible.

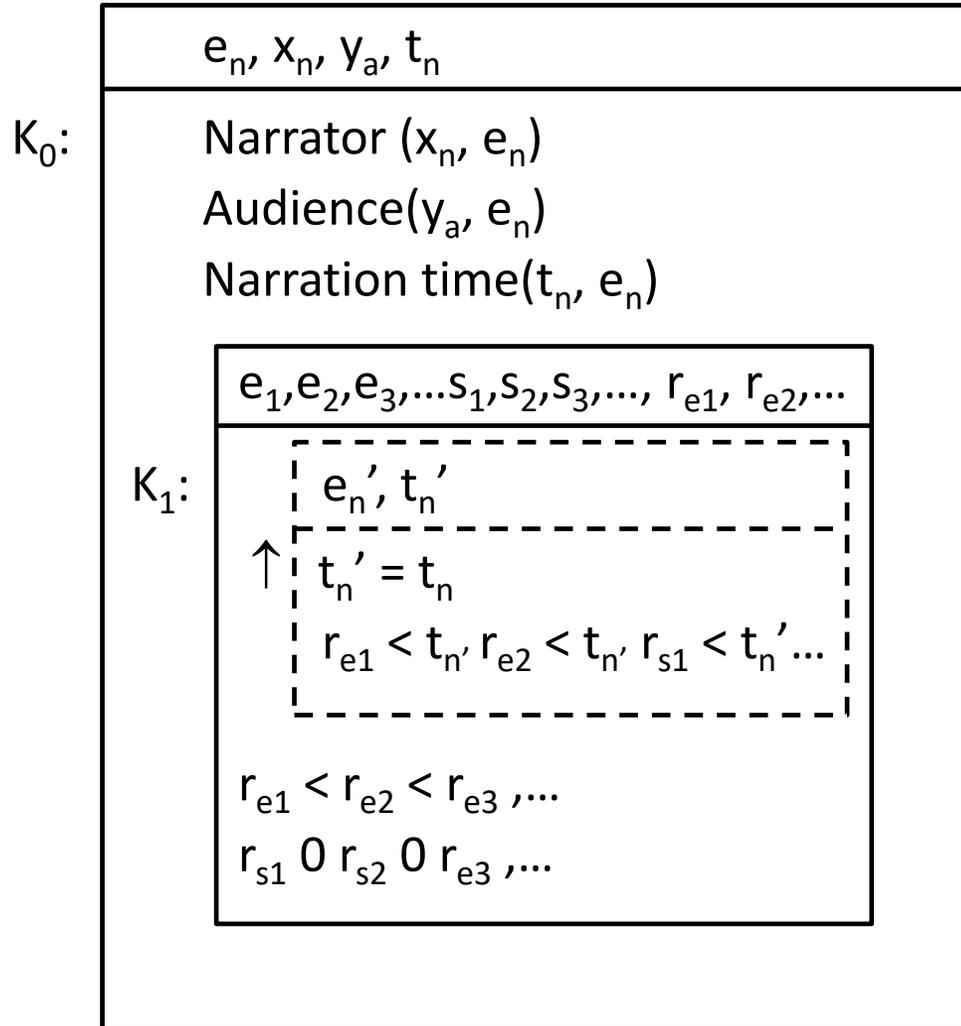
When Mr and Mrs Dursley *woke* up on the dull, grey Tuesday our story *starts*, there *was* nothing about the cloudy sky outside to suggest that strange and mysterious things *would soon be happening* all over the country.

PAST tense in narrative discourse

- PAST tense creates fictional world removed from reality.
- Fictional past (Fleischmann 1990).
- In narrative discourse, PAST tense is anchored to the narration time.

When Mr and Mrs Dursley *woke* up on the dull, grey Tuesday our story *starts*, there *was* nothing about the cloudy sky outside to suggest that strange and mysterious things *would soon be happening* all over the country.

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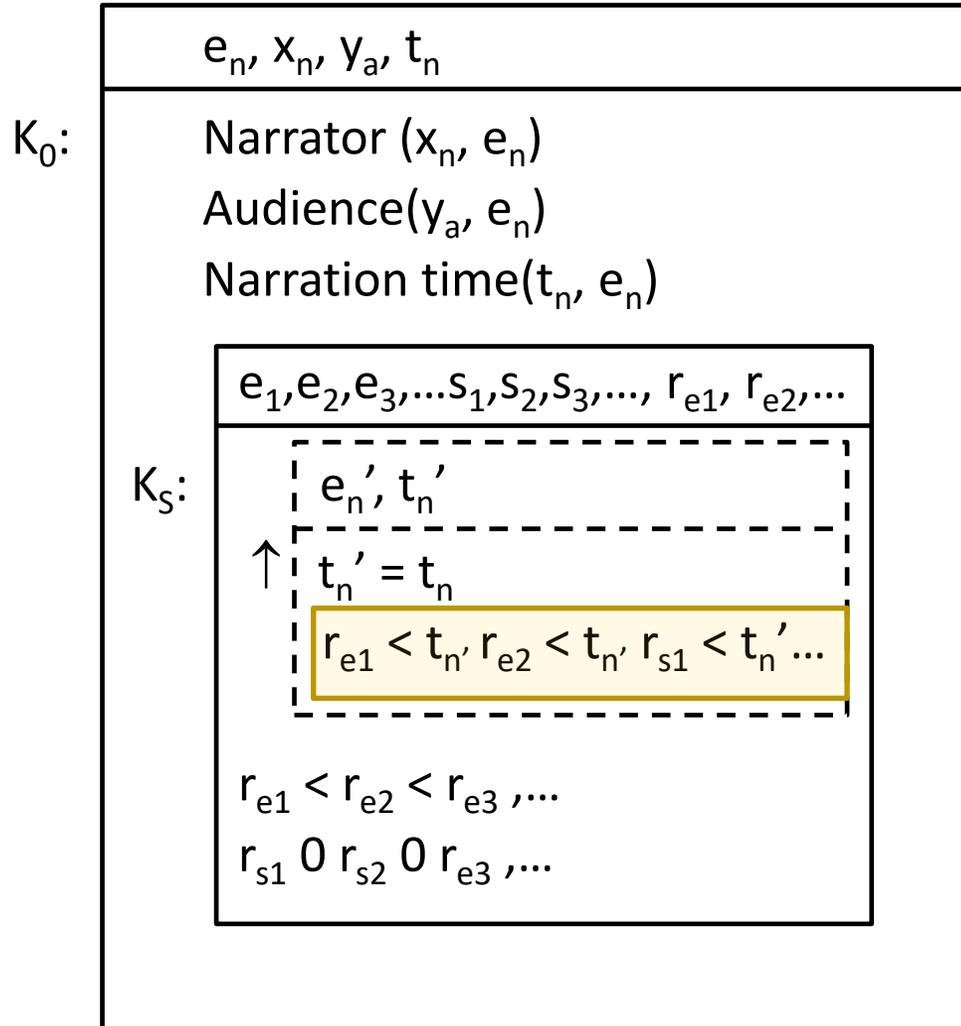


In narrative discourse, PAST tense is anchored to the narration time.

Sequence of PAST tense sentences: anaphoricity.

Sequence of events (Narration) or temporal overlap Background).

PAST tense in narrative discourse

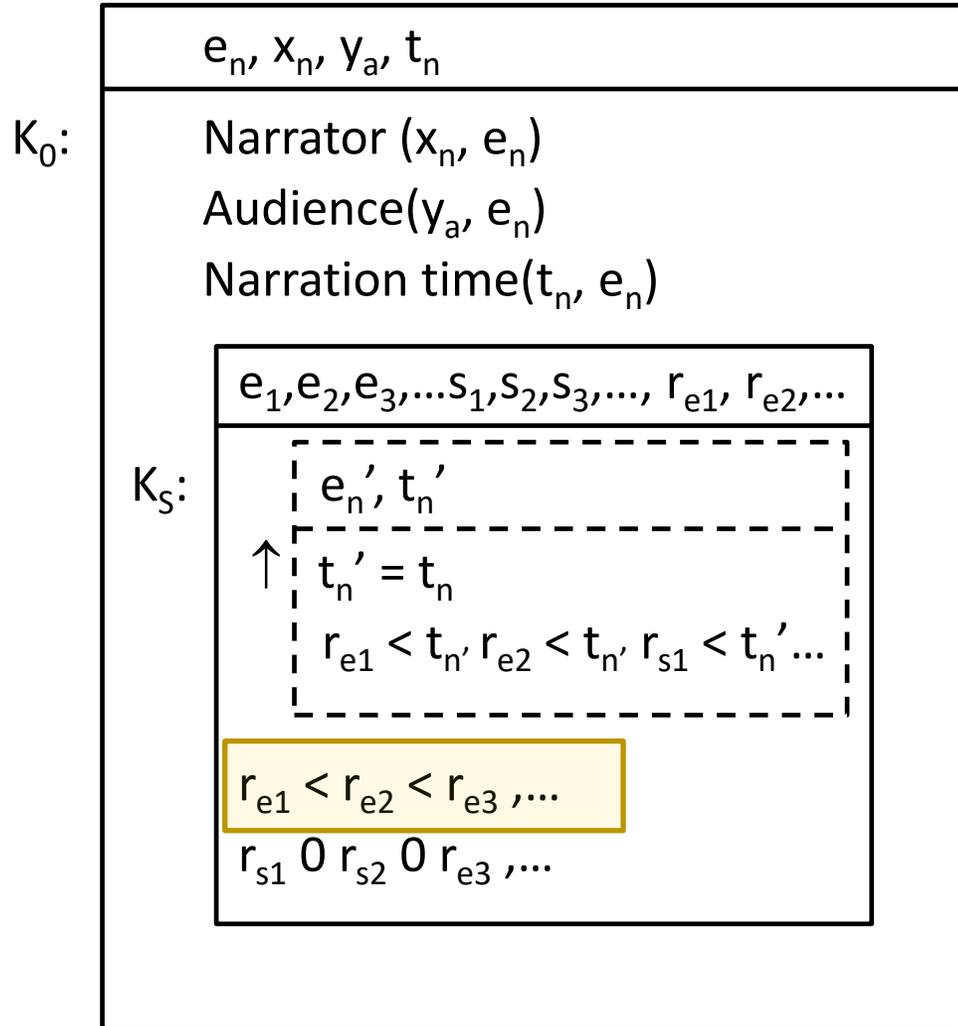


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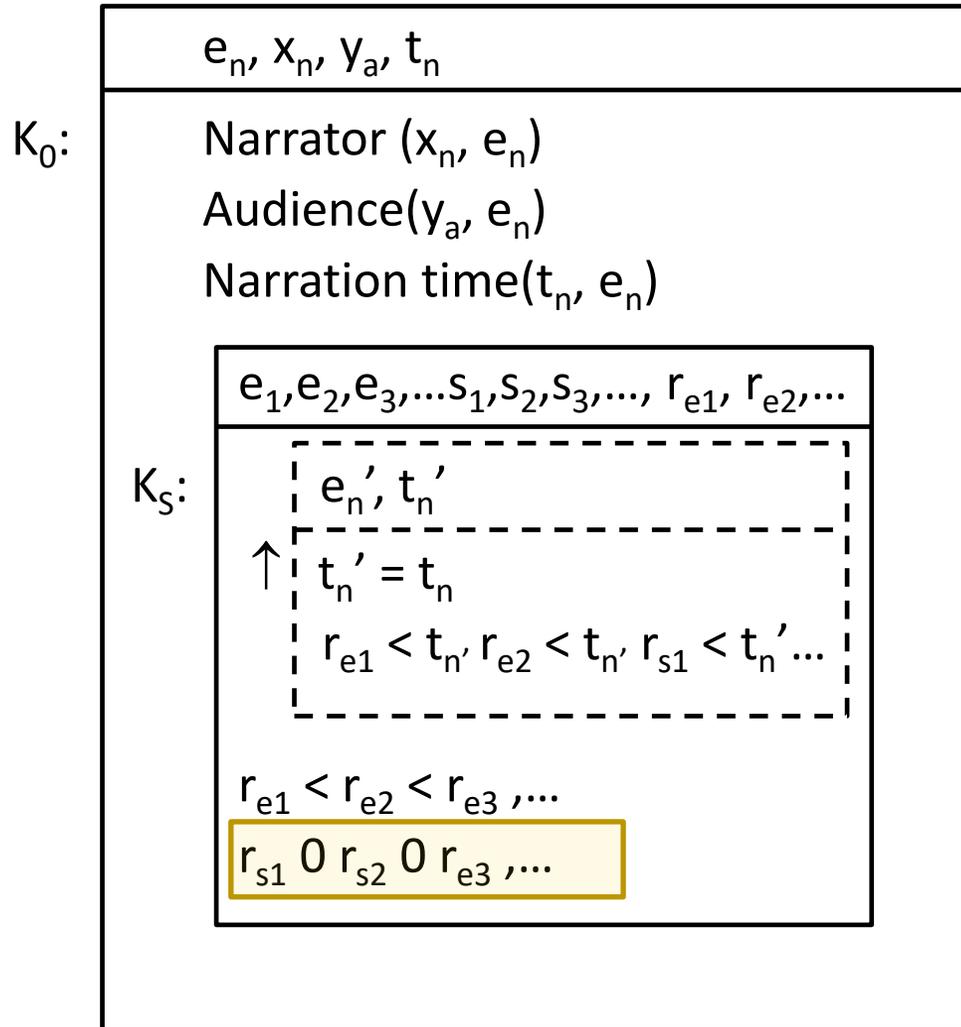


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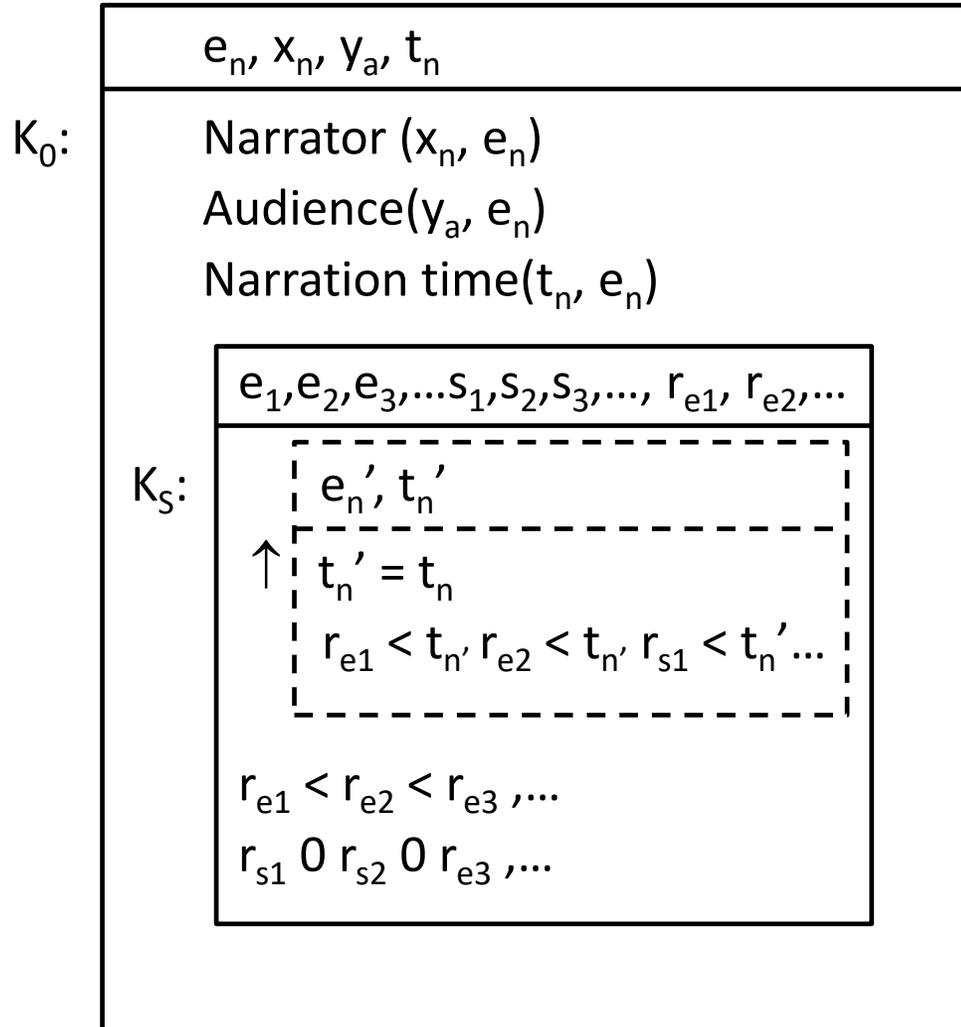


In narrative discourse, PAST tense is anchored to the narration time.

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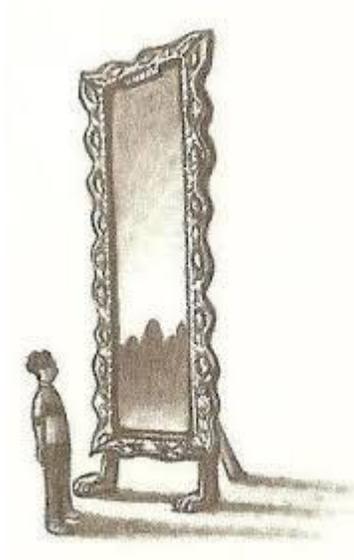
Temporal structure at the discourse level

- Incorporate classical DRT/SDRT analysis of tense and aspect in the indexical DRT framework of tense.
- PAST tense in discourse combines deictic and anaphoric meaning ingredients.
- Integrated analysis in one-dimensional theory of indexicality.

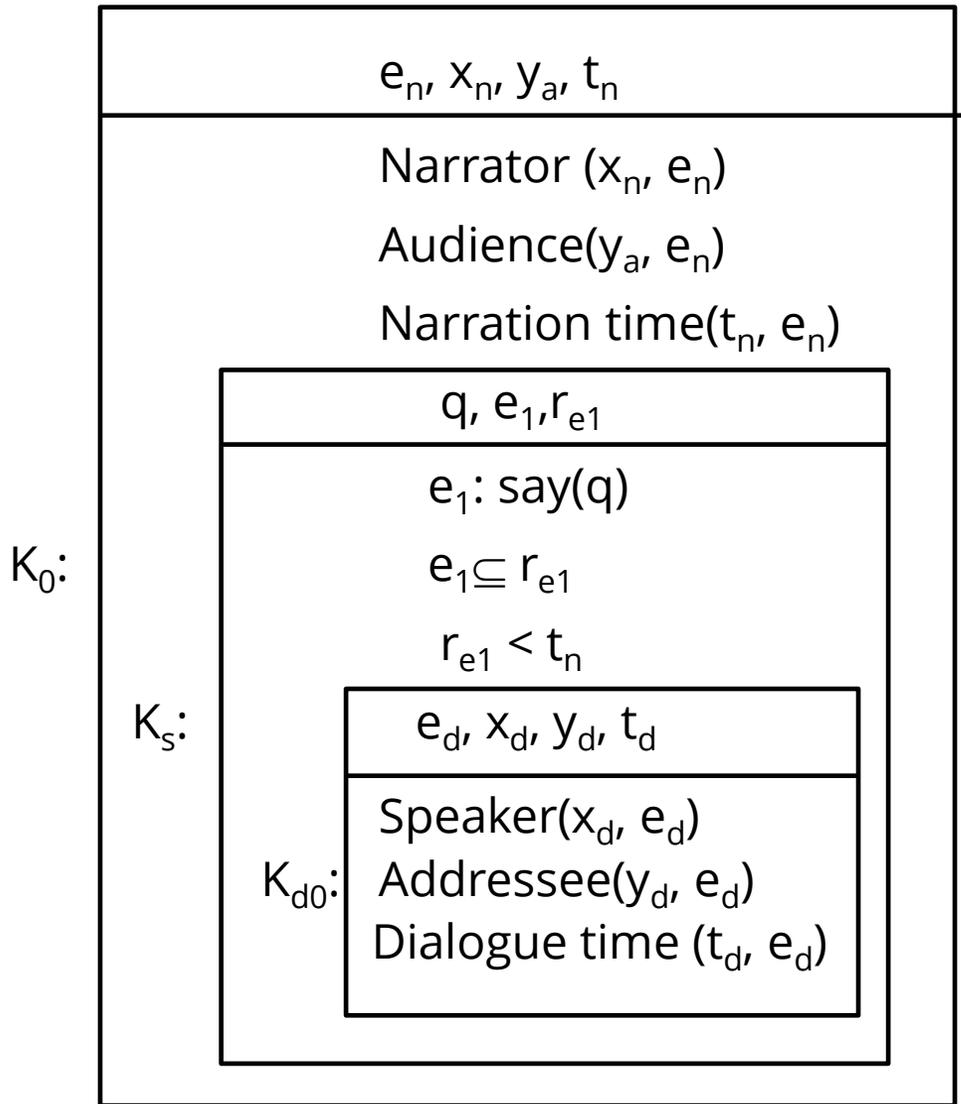
At half past eight, Mr Dursley *picked* up his briefcase, *pecked* Mrs Dursley on the cheek and *tried* to kiss Dudley goodbye but *missed*, because Dudley *was now having* a tantrum and *throwing* his cereal at the walls.

From narrative discourse to tense use in dialogue

‘Well?’ *said* Quirrell impatiently.
‘What *do* you see?’

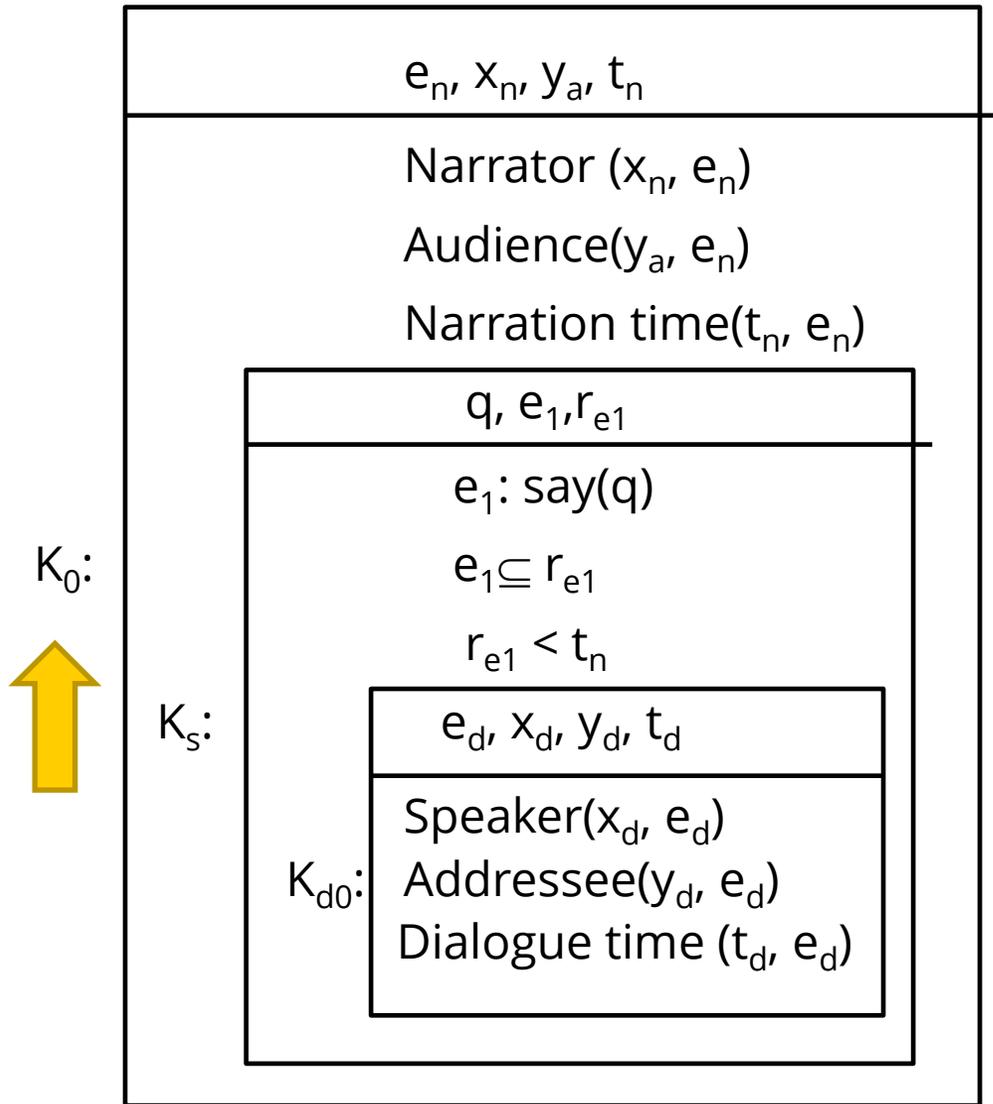


- Written dialogue is introduced by a speech act verb in discourse: *say, ask, answer, ...*
- Linguistic anchoring of indexicals:
 - Argument structure of the verb fixes the value of indexical pronouns (*I, you*).
 - PAST tense on the speech act verb fixes the utterance time of the direct speech to the story time.



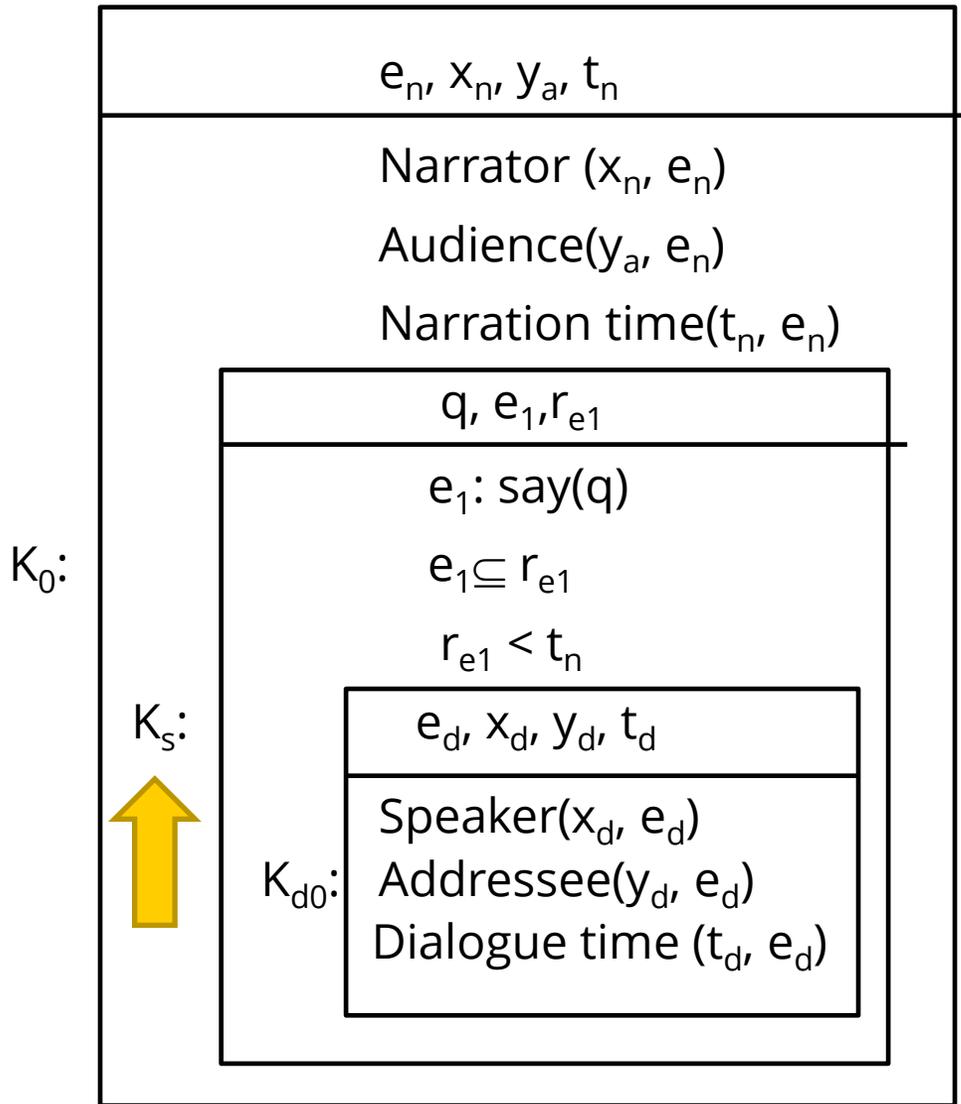
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- K_0 represents the narration process.
- K_s represents the narrative discourse.
- The speech act verb is part of the narrative discourse (saying event in the fictional past).
- The speech act verb introduces a new DRS K_{d0} that represents the utterance situation, with its speaker/addressee/speech time.



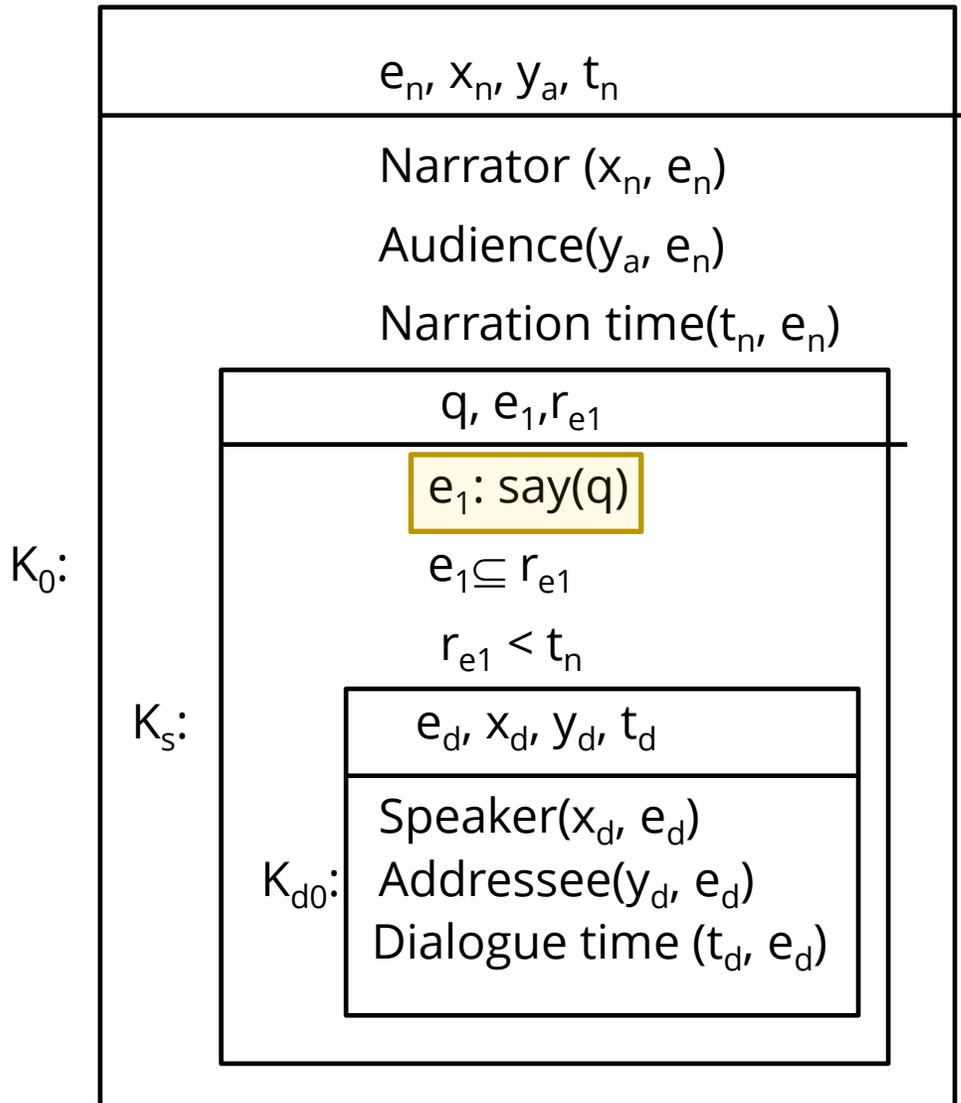
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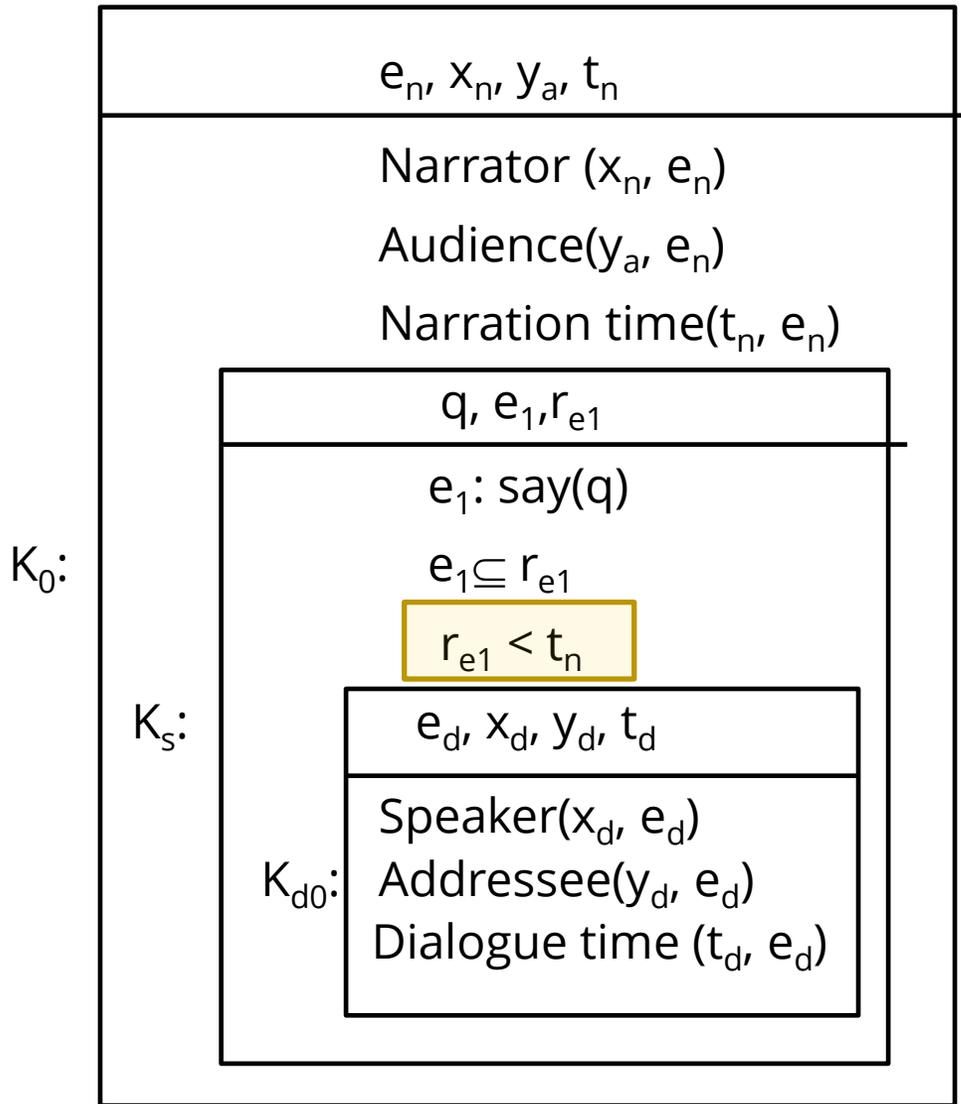
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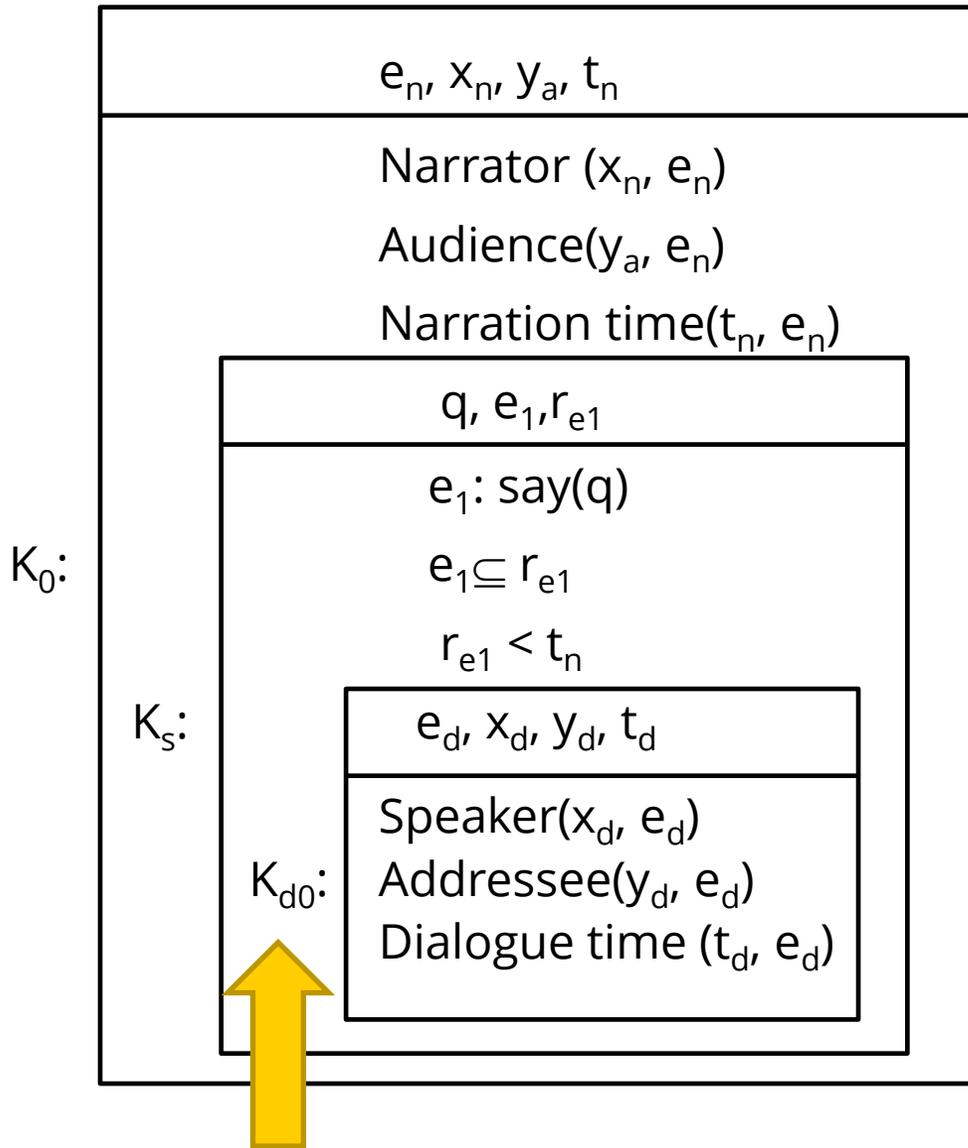
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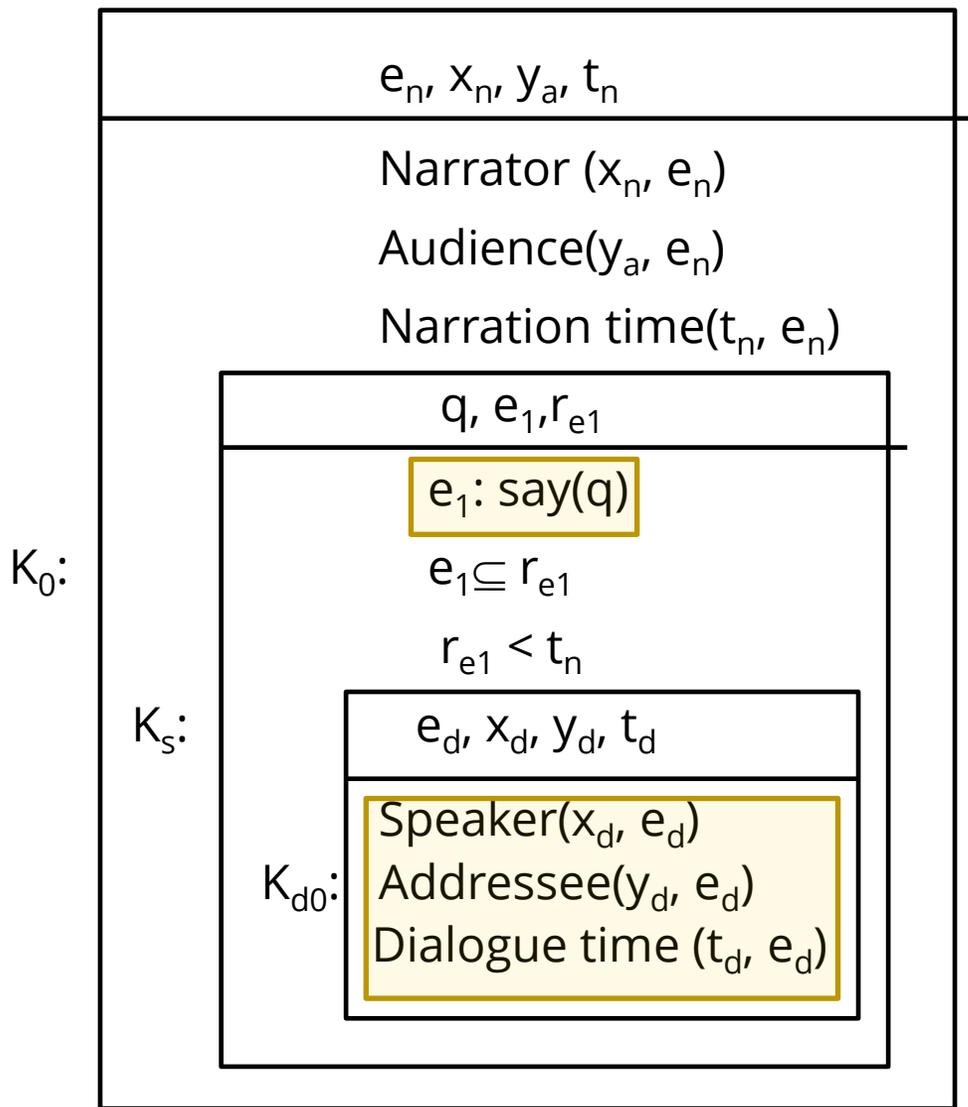
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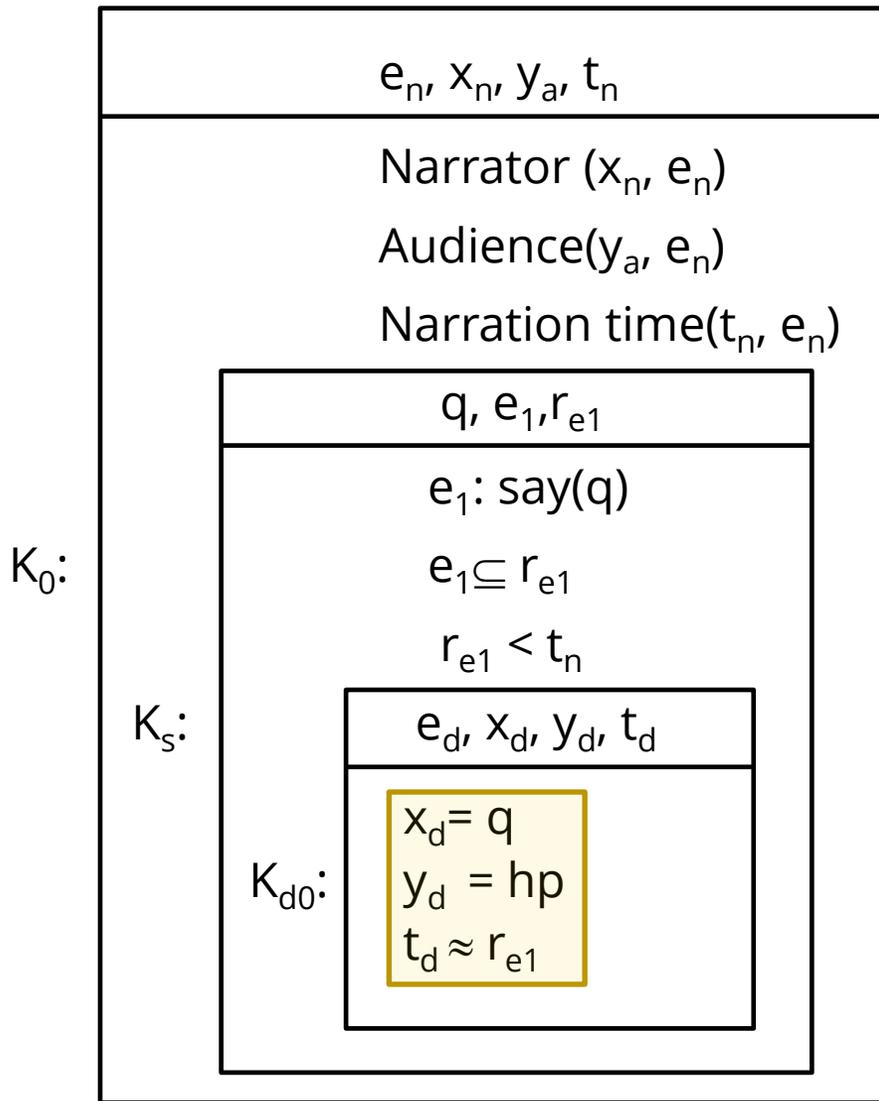
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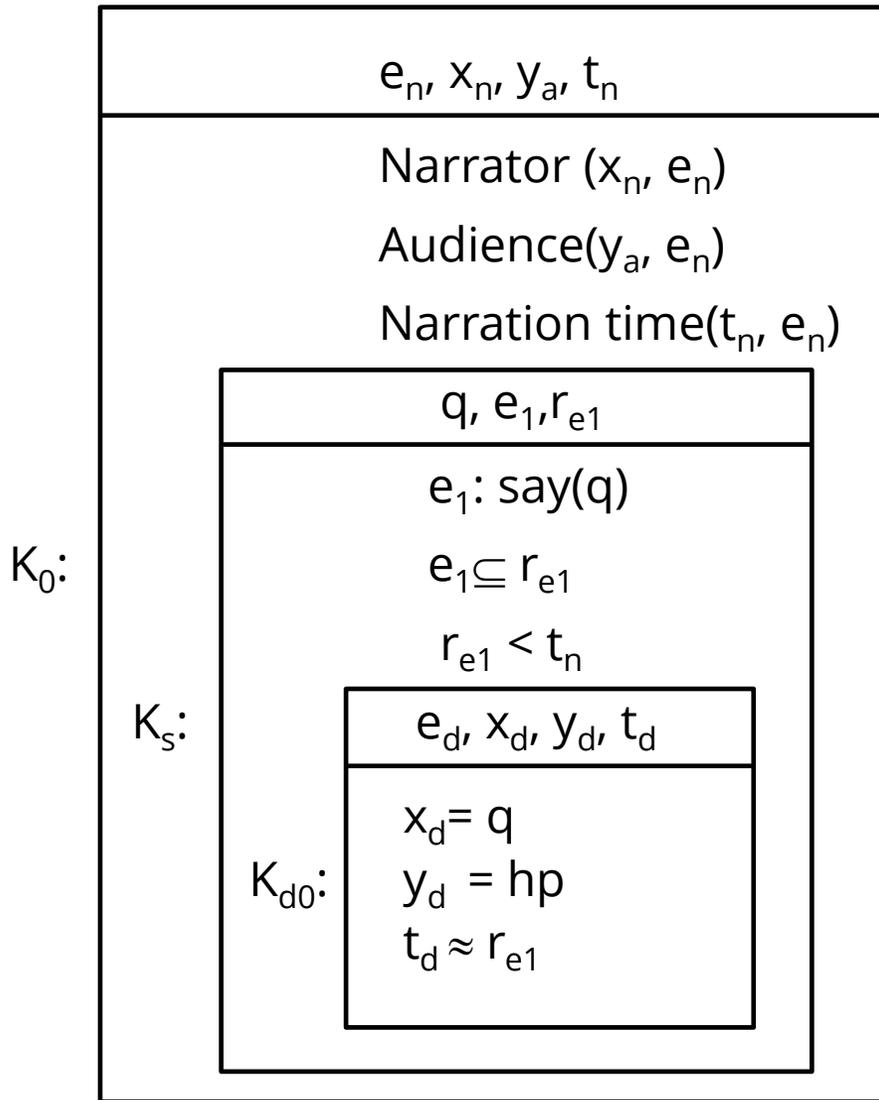
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- The anchoring conditions on speaker, addressee, time of direct speech are inferred from K_s .
- Time t_d of the dialogue is the reference time r_{e1} of the saying event.



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- Recursive structure with K_{d0} and K_0 .

K_0 :

e_n, x_n, y_a, t_n

Narrator (x_n, e_n)

Audience (y_a, e_n)

Narration time (t_n, e_n)

K_s :

q, e_1, r_{e1}

$e_1: \text{say}(q)$

$e_1 \subseteq r_{e1}$

$r_{e1} < t_n$

K_{d0} :

e_d, x_d, y_d, t_d

Speaker (x_d, e_d), $x_d = q$

Addressee (y_d, e_d), $y_d = hp$

Dialogue time (t_d, e_d), $t_d \approx r_{e1}$

K_d :

z, e_2, r_{e2}

y'_d, t'_d

$y'_d = ?$

$r_{e2} = ?$

$t'_d = ?$

$e_2: \text{see}(y'_d, ?z)$

$e_2 \subseteq r_{e2}$

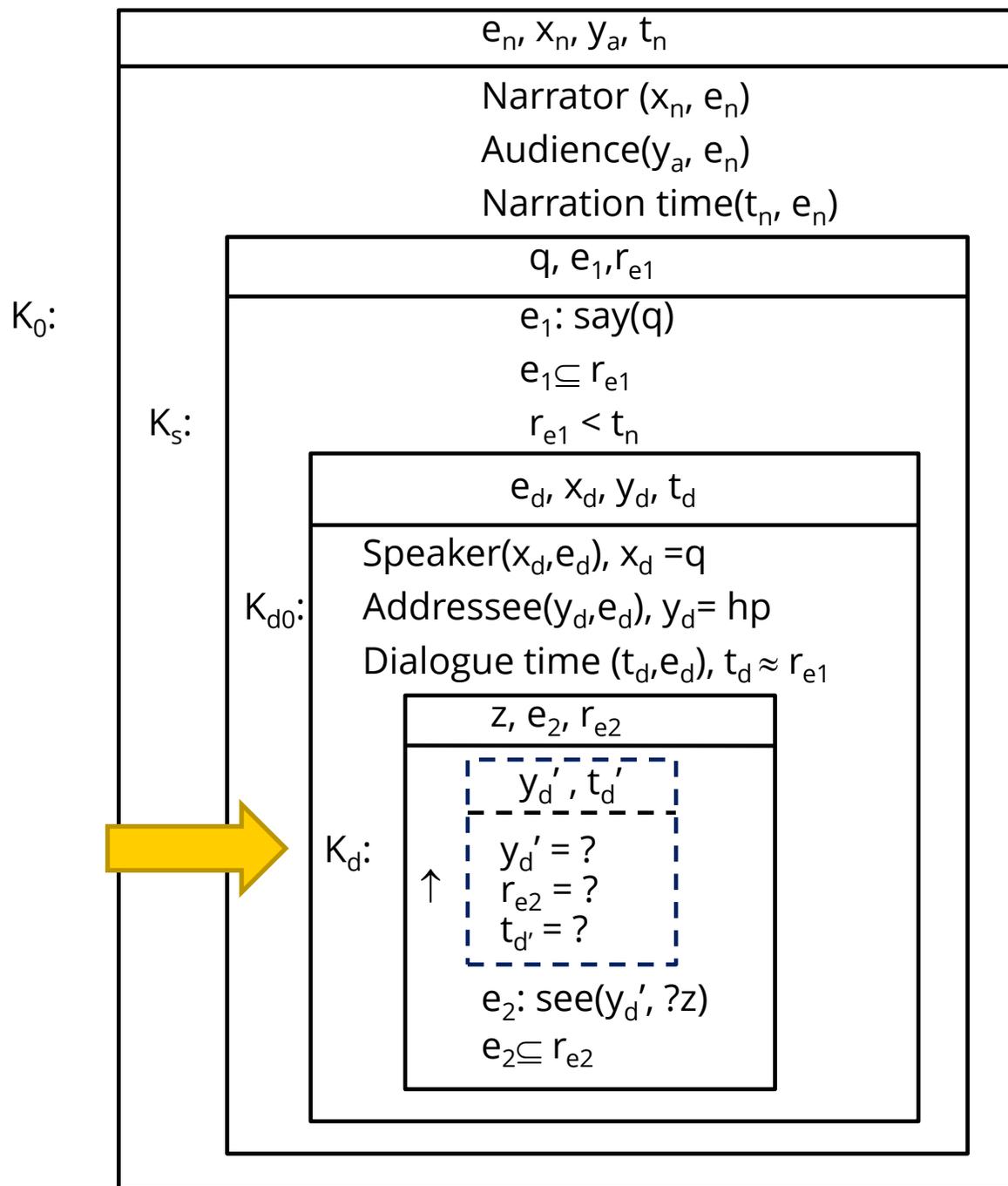
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The content of K_d consists of the material between quotation marks.

Introduce event structure in K_d (standard).

Indexicals in direct speech introduce an anaphoric condition in presuppositional part of K_d , embedded under the ↑ operator.



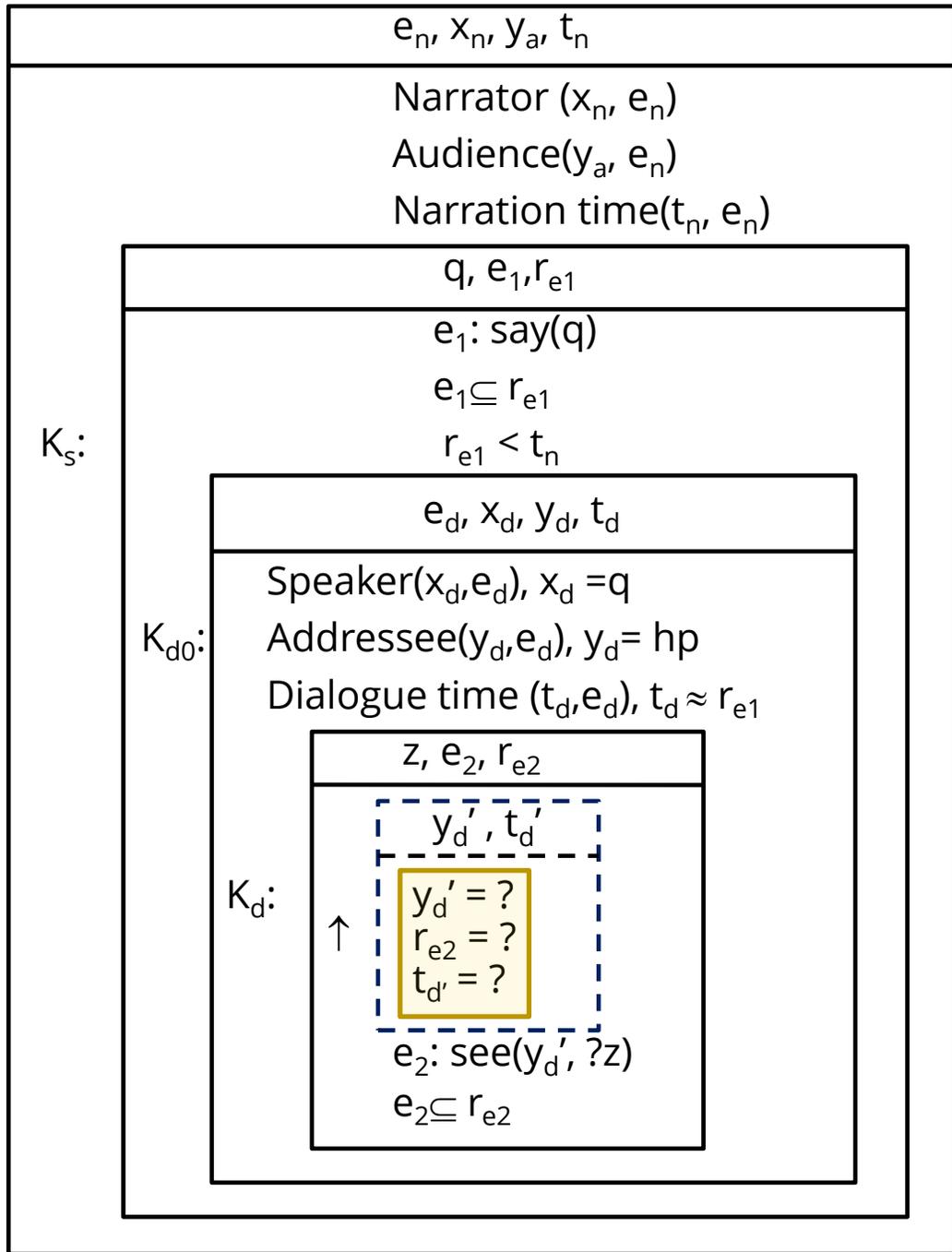
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K_0 :



K_s :

K_{d0} :

K_d :

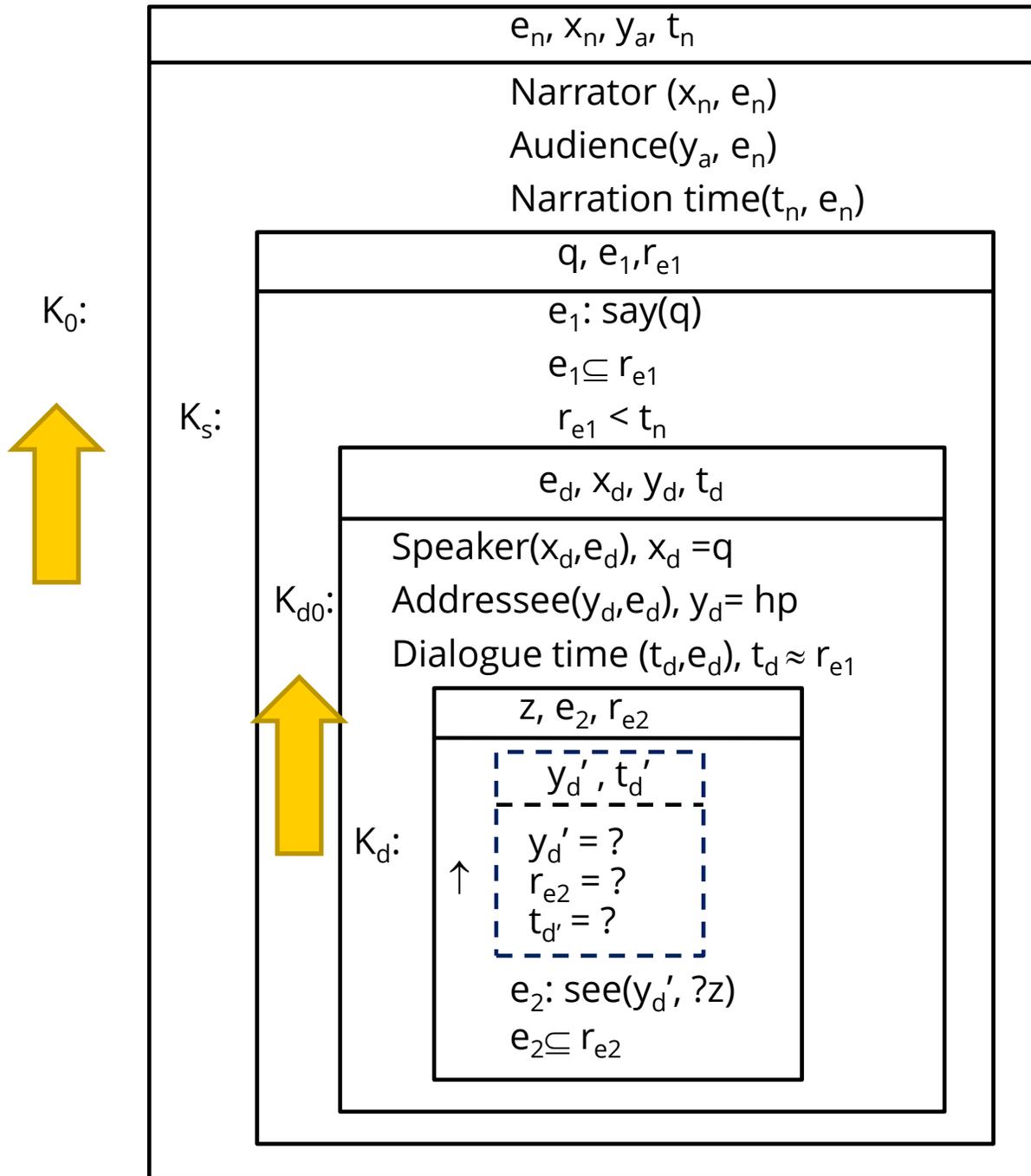
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Indexicals in direct speech introduce an anaphoric condition in presuppositional part of K_d , embedded under the \uparrow operator.

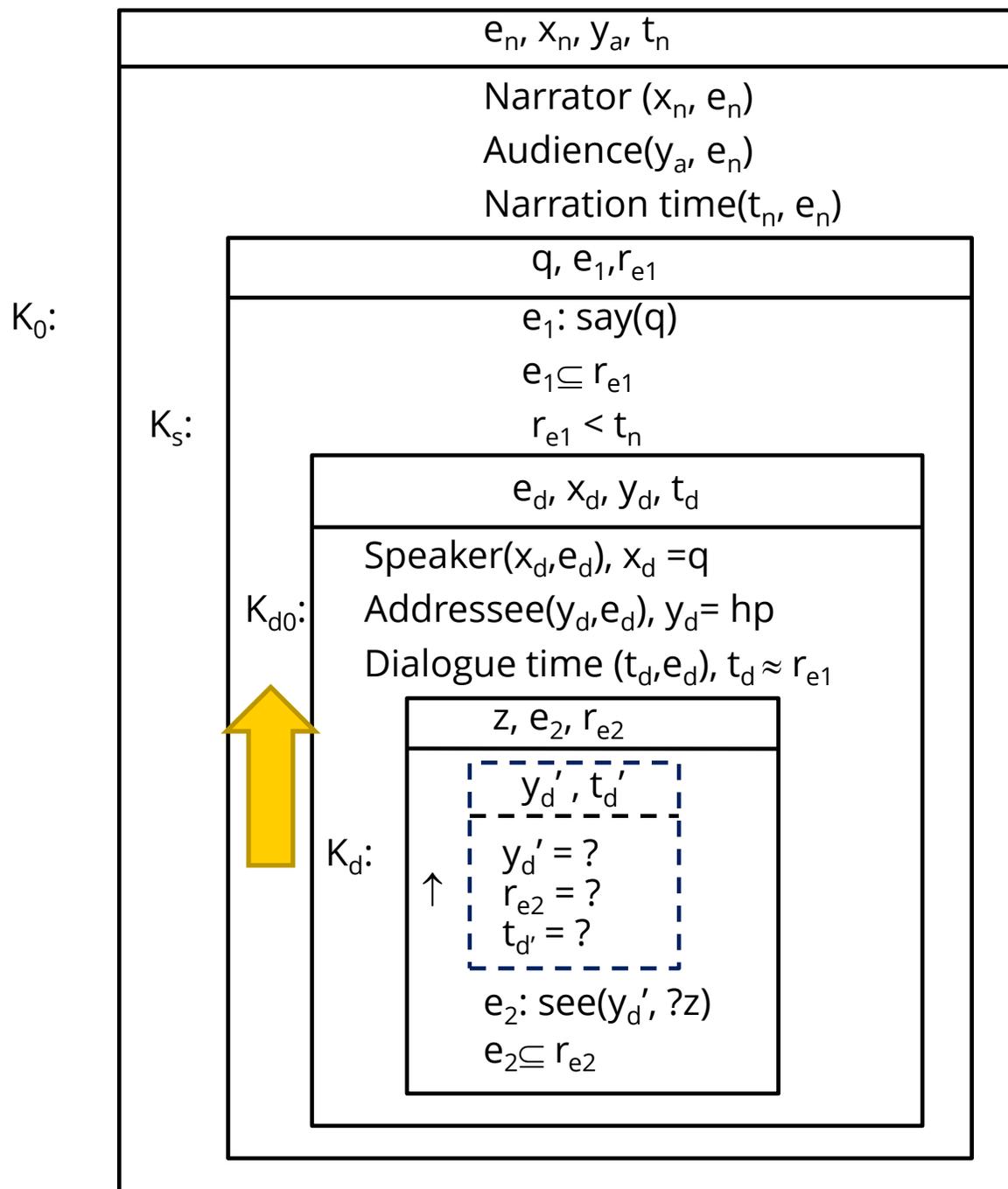


‘Well?’ said Quirrell impatiently.
 ‘What do you see?’

Indexicals in direct speech introduce an anaphoric condition in presuppositional part of K_d , embedded under the \uparrow operator.

Recursive structure with K_{d0} and K_0 .

Revised resolution mechanism: indexicals in direct speech anchor to the closest utterance event in the DRS (K_{d0}).

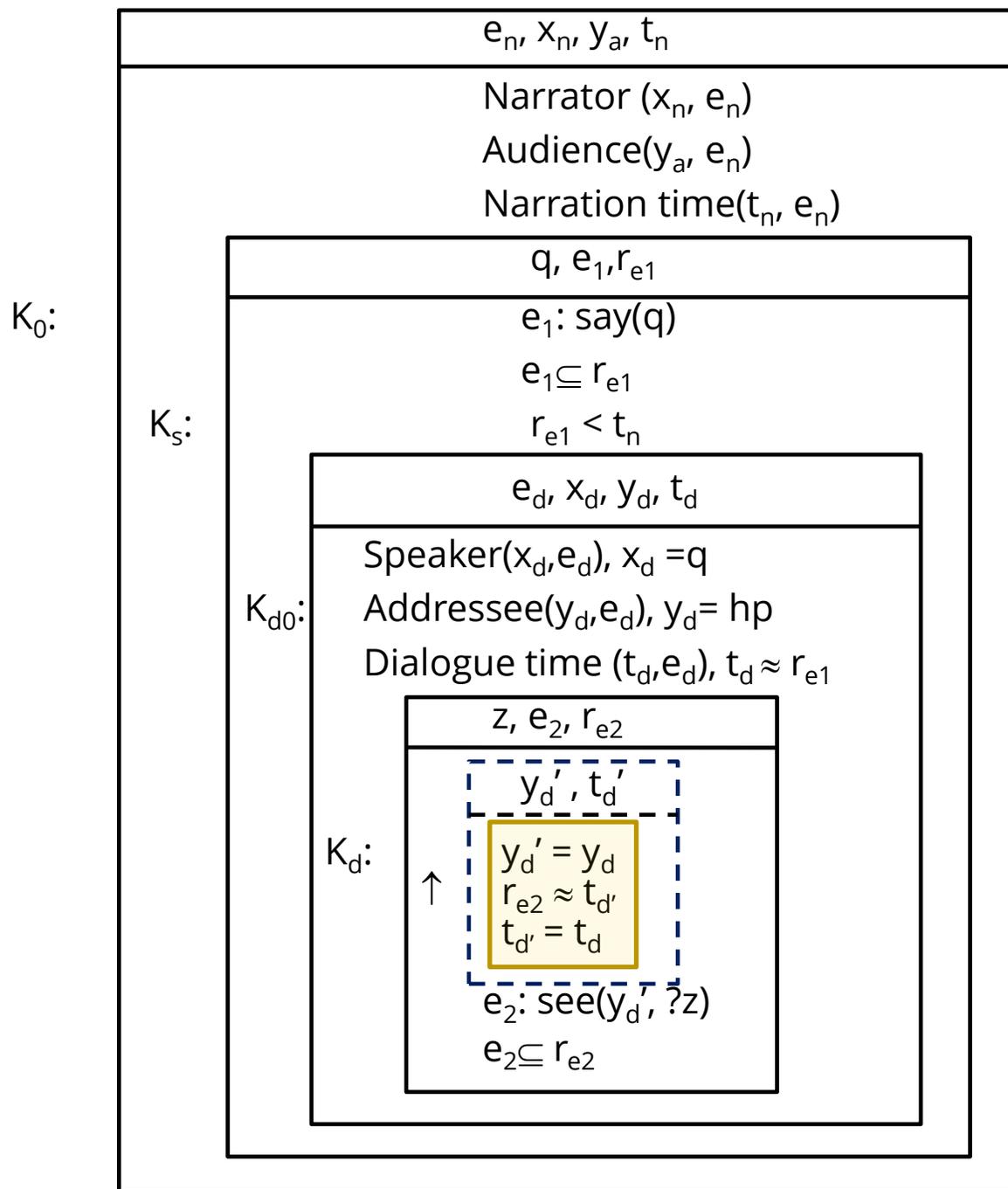


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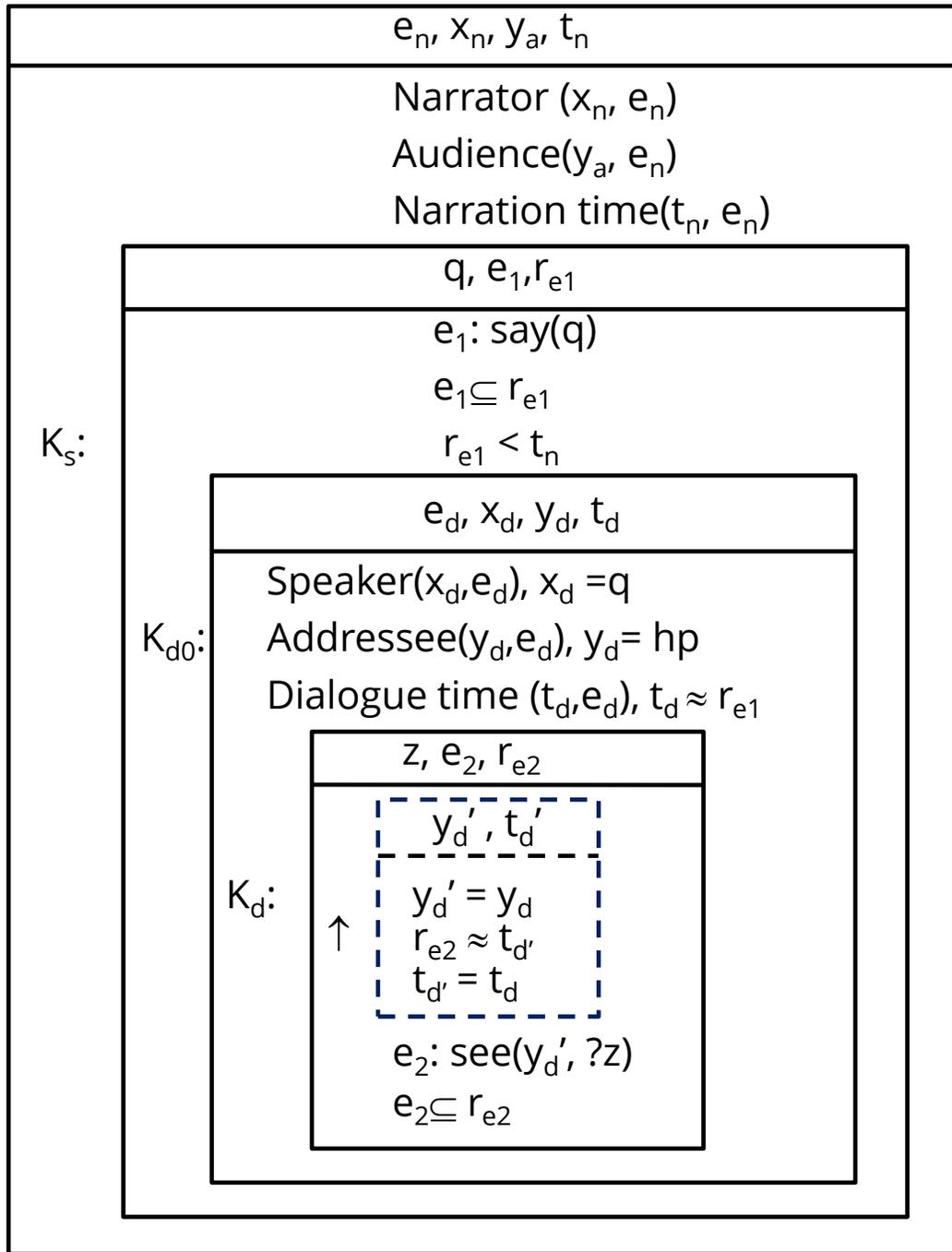
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2st person pronoun in the dialogue box is identified with the addressee of the speech act event e_1 (=hp).

PRESENT tense closely identifies the time of seeing (\approx) with the presupposed time $t_{d'}$.

The presupposed dialogue time $t_{d'}$ is the time t_d of the speech act event.

K_0 :

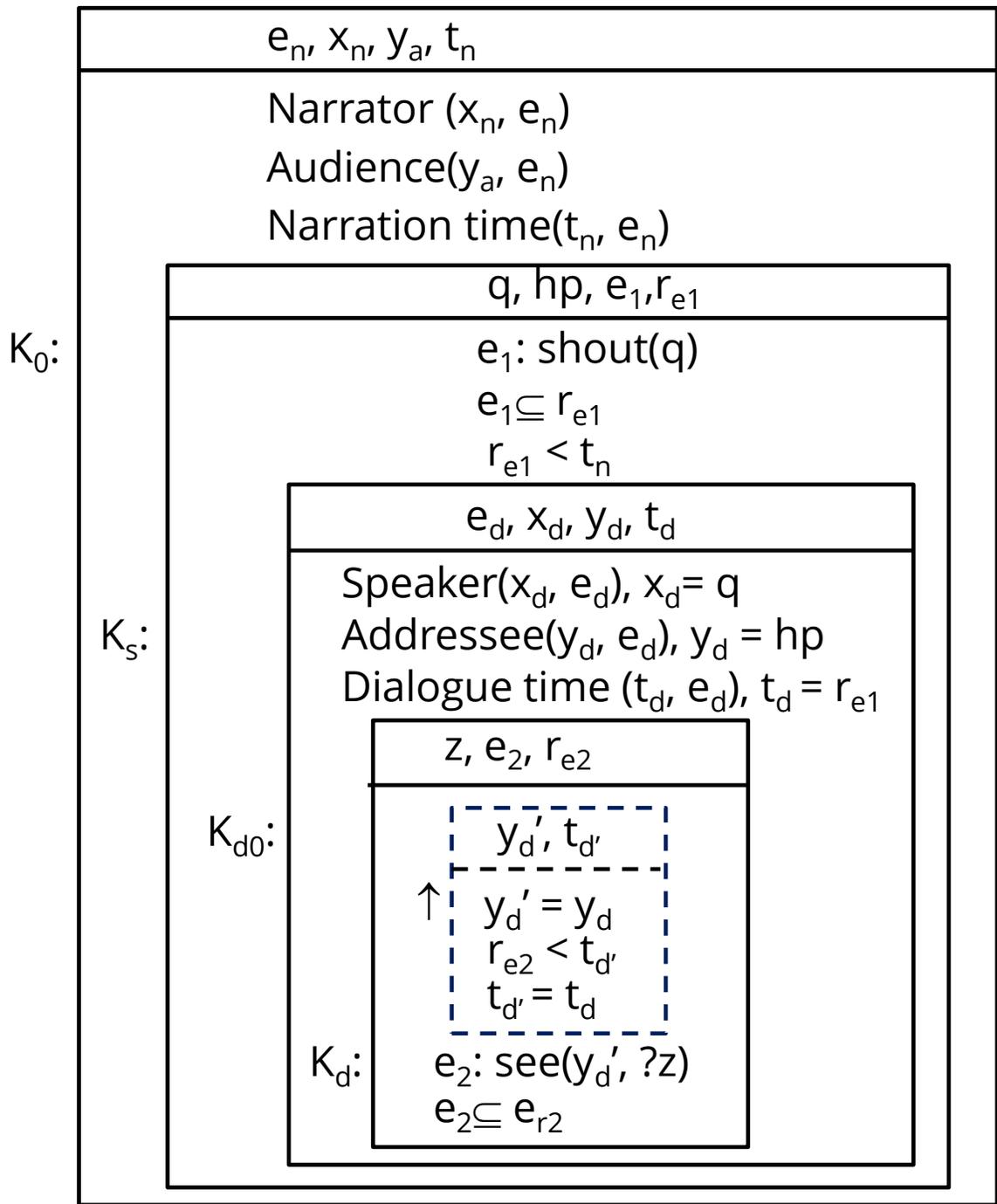


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PRESENT tense in direct speech locates the time of seeing by Harry Potter at the time of talking by Quirrell.

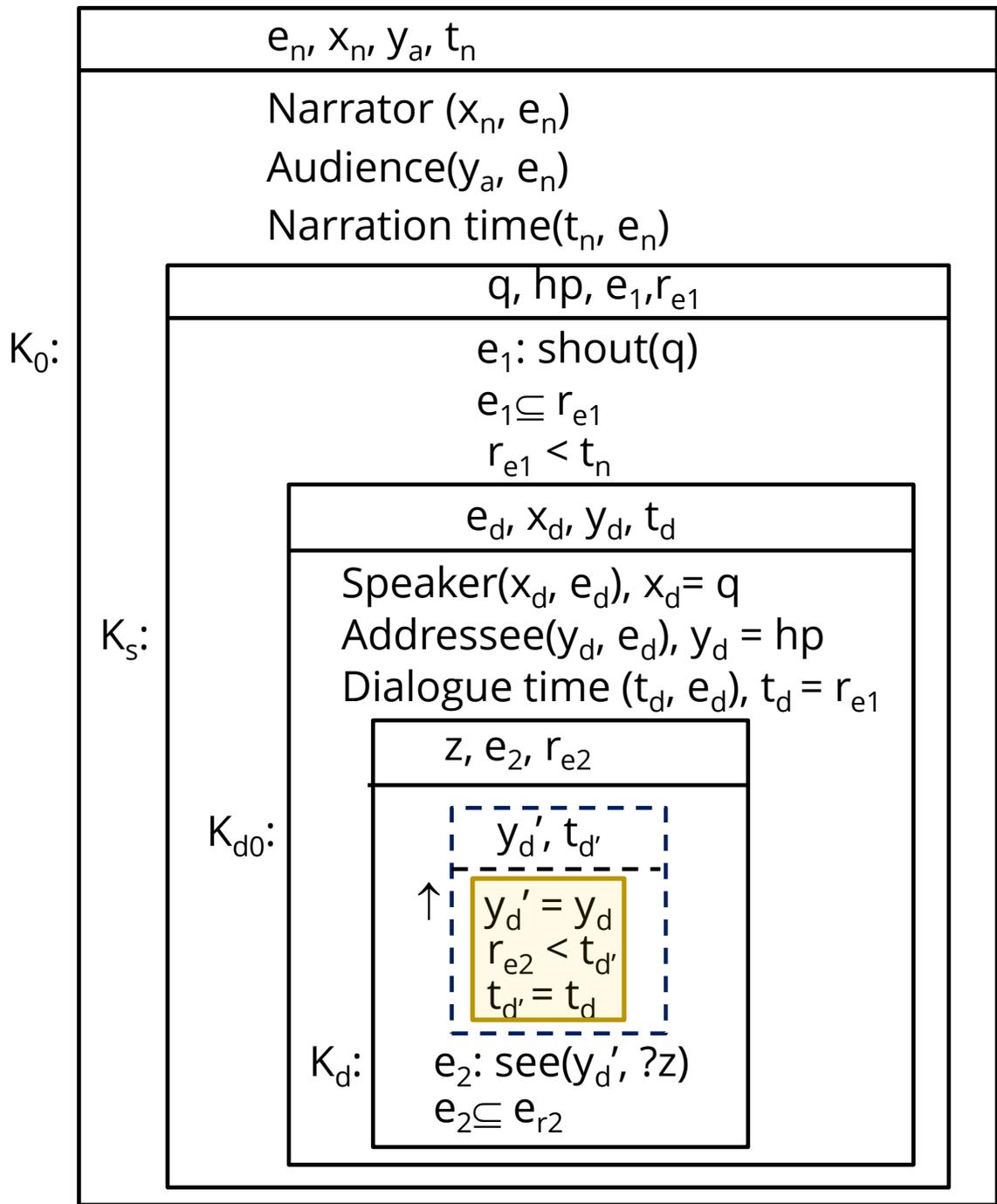


Just as in real life conversation, all kinds of tenses appear in fictional dialogue.

'Quirrell *shouted*. 'Tell me the truth
What *did* you just see?'

2st person pronoun in the dialogue box closely identifies (\approx) with the addressee of the speech act y_1 (=hp).

PAST tense: precedence relation with $t_{d'}$, which is identified with t_d , which is the reference time of the speech act r_{e1} .



Just as in real life conversation, all kinds of tenses appear in fictional dialogue.

'Quirrell *shouted*. 'Tell me the truth
What *did* you just see?'

PAST tense: precedence relation with t_d' , which is identified with t_d , the time of the speech act.

PAST tense in direct speech locates the time of seeing by Harry Potter before the talking by Quirrell.

Conclusions on indexical tense use in fiction

- Tense is inherently deictic (Reichenbach 1947; Comrie 1976, 1985).
- PRESENT, PRESENT PERFECT and FUTURE are 'pure' indexicals: dependence on utterance event, restricted to dialogue.
- PAST and PAST PERFECT are mixed deictic/anaphoric categories: occur in discourse and dialogue.

An DRT framework for indexicality

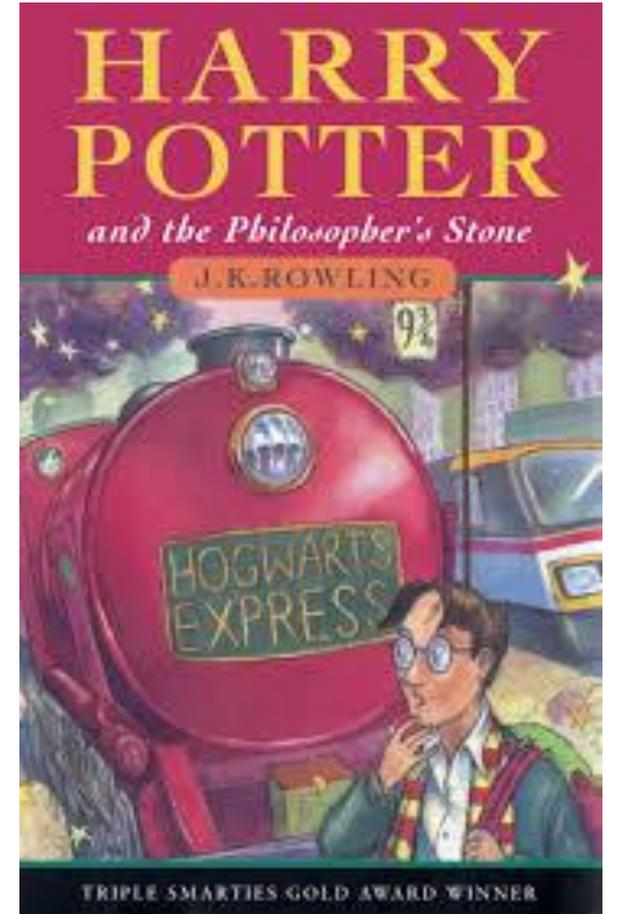
- One-dimensional theory of indexicality: integrated account of indexical and anaphoric expressions.
- DRT framework by Hunter (2013, 2014):
 - introduce top-level DRS K_0 ;
 - K_0 spells out extra-linguistic information related to utterance situation;
 - Parameters: speaker, addressee, speech time, ...
- Extension of the model to tense.
- Extension of the model to fiction.

Account of indexical tense in discourse and dialogue

- Indexicals in discourse (pronouns, tenses) depend on the narration process:
 - Adjusted set-up of K_0 ;
 - Parameters: narrator, audience, narration time,...
- Indexicals in written dialogue are linguistically anchored to the speech act verb in discourse:
 - Revised resolution mechanism in DRT;
 - Parameters of the speech act verb determine the value of speaker, addressee, dialogue time in direct speech.

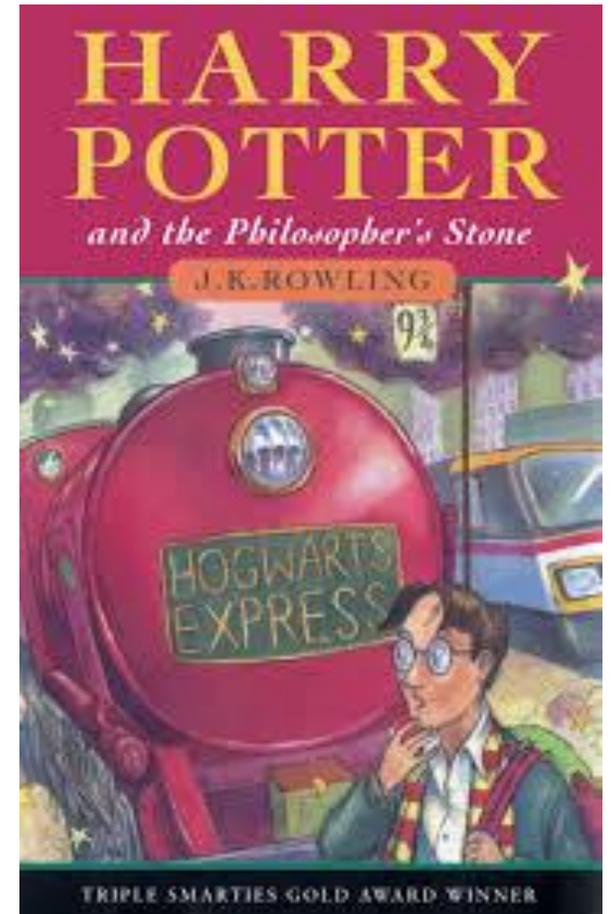
Time in translation

- Data driven approach: empirical evidence for the analysis grounded in corpus data.
- Formal DRT analysis worked out for English.
- Correlation between tense use and register statistically significant for all languages in the dataset.
- Indexical theory of tense relevant to the tense-aspect grammar of Western European languages.



Time in translation

- *Translation Mining*: reliable methodology to investigate cross-linguistic stability and variation.
- Written dialogue as a proxy for spoken language, at least as far as indexicals are concerned.
- Parallel corpus of *Harry Potter and the Philosopher's Stone* enables the cross-linguistic investigation of the grammar of spoken language.





Thank you for your attention!

General information on <https://time-in-translation.hum.uu.nl/>

Try out *Translation Mining* via
<https://tst.time-in-translation.hum.uu.nl/>