

# Representing Complex Relative Chronology Across Narrative Levels in Movie Plots



natural interaction based on language

nil

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# Motivation

Representing relative chronology of events is fundamental for narrative

But real stories are very complex in terms of relative chronology

- very rarely simple sequences (flashbacks, foreshadowing)

- often recursively embedded (stories within stories)

- often involving reference to events “not happened” (plans, wishes, conditions)

- often occurring across more than one world (fiction)

How do these aspects affect the relative chronology we want to represent?

# Content

Sources for identifying plot in movies

Action units as representation mechanism

Handling Embedded stories

Handling Fictional Worlds

Inferring Temporal Relations

Handling Modalities

Conclusions and Future Work

FADE IN ON:

A VIDEO GAME ON A COMPUTER SCREEN

The game is in progress. As a sick coughing sound is heard.

CUT TO:

THIS KID

lying in bed, coughing. Pale, one sick cookie. Maybe he's seven or eight or nine. He holds a remote in one hand, presses it, and the video game moves a little bit. Then he's hit by another spasm of coughing, puts the remote down.

His room is monochromatic, greys and blues, mildly high-tech.

We're in the present day and this is a middle class house, somewhere in the suburbs.

CUT TO:

The Kid's MOTHER as she enters, goes to him, fluffs his pillows, kisses him, and briefly feels his forehead. She's worried, it doesn't show. During this

MOTHER

You feeling any better?

THE KID

A little bit.

MOTHER

Guess what.

THE KID

What?

MOTHER

Your grandfather's here.

THE KID

(not overjoyed)

Mom, can't you tell him that I'm sick?

MOTHER

You are sick, that's why he's here.

THE KID

He'll pinch my cheek. I hate that.

MOTHER

Maybe he won't.



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- Universe: the world in which the event takes place
- Narrative Level: the depth of narrative level at which the event is narrated (with respect to the primary frame story, which is numbered as 0)
- Action Unit ID: a univocal identifier for the action unit
- Mode: identifies events that differ in the degree of truth assigned to them by the speaker (captures issues such as modality)
- Relative Order: describes temporal relation of the action unit with other action units, using Allen's temporal algebra (number refers to each of the types of relations proposed by Allen)
  
- Content transcription: a number of fields that capture the informational content of the action unit, including: type of action, subject of the action, direct object of the action, indirect object of the action (if present), location of the action, and a set of action units that may be referred to when the action involves a verb of speech

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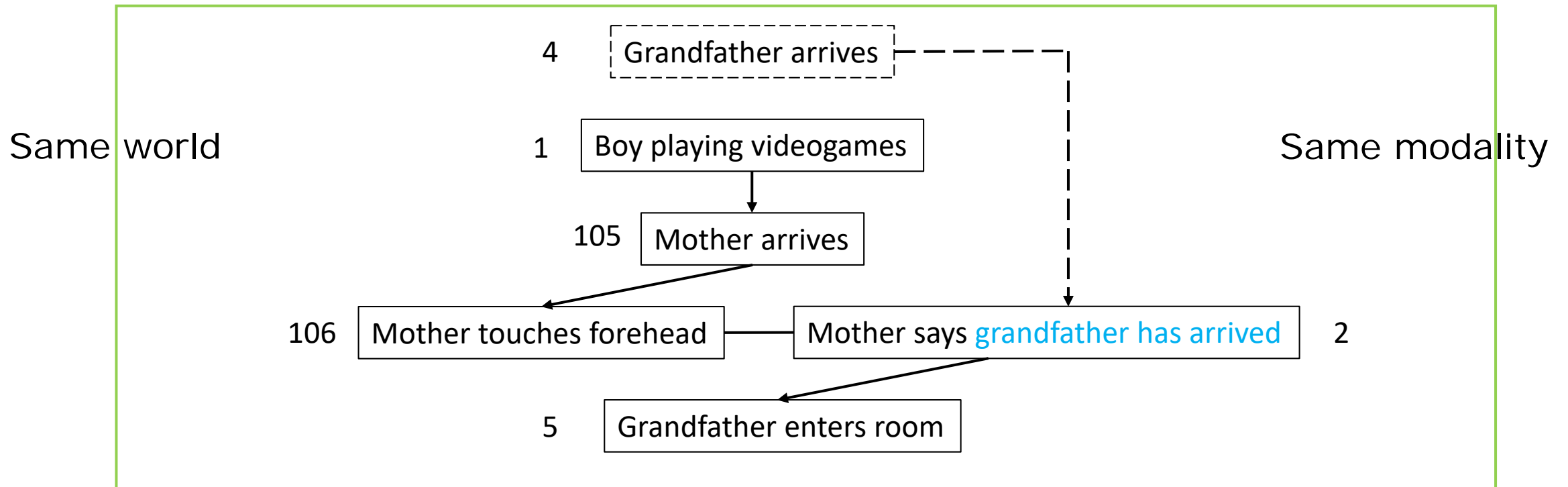
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Universe	Narrative Level	Action Unit ID	Mode	Relative Order			Action Subject	Action	Direct Object	Indirect Object	Place
A	0	1		1	equals	1	boy	play	videogames		room
A	0	105		1	meets	105	mother	enter			room
A	0	106		105	meets	106	mother	touch	boy's forehead		room
A	0	2		106	equals	2	mother	speak	4	boy	room
A	1	4		4	precedes	2	grandfather	arrive			house
A	0	5		2	meets	5	grandfather	enter			room



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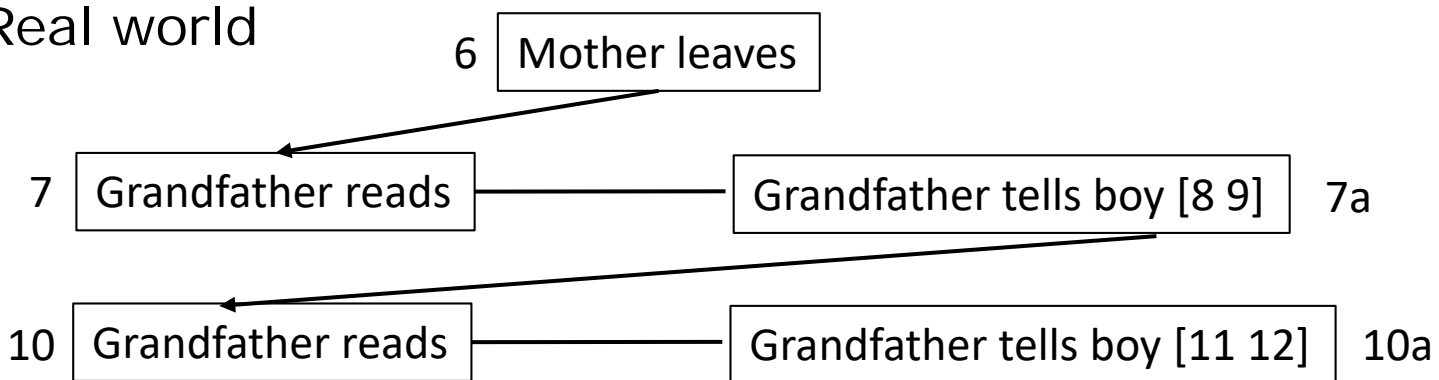
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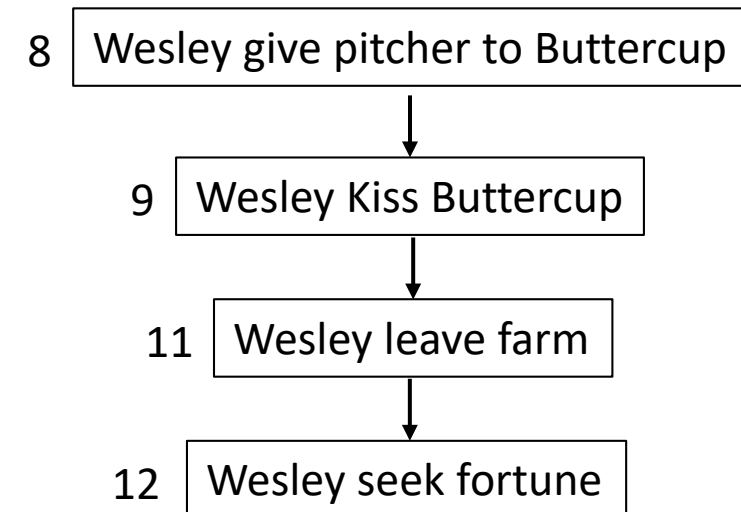
Conclusions and Future Work

Universe	Narrative Level	Action Unit ID	Mode	Relative Order			Action Subject	Action	Direct Object	Indirect Object	Place
A	0	6		5	meets	6	mother	leave			room
A	0	7		6	meets	7	grandfather	read	book	boy	room
A	0	7a		7a	equals	7	grandfather	tell	8,9	boy	room
B	1	8		8	equals	8	Westley	give	pitcher	Buttercup	farm
B	1	9		8	meets	9	Westley	kiss	Buttercup		farm
A	0	10		7	meets	10	grandfather	read	book		room
A	0	10a		10a	equals	10	grandfather	tell	11,12	boy	room
B	1	11		9	meets	11	Westley	leave			farm
B	1	12		11	starts	12	Westley	seek	fortune		sea

### Real world



### Fictional world



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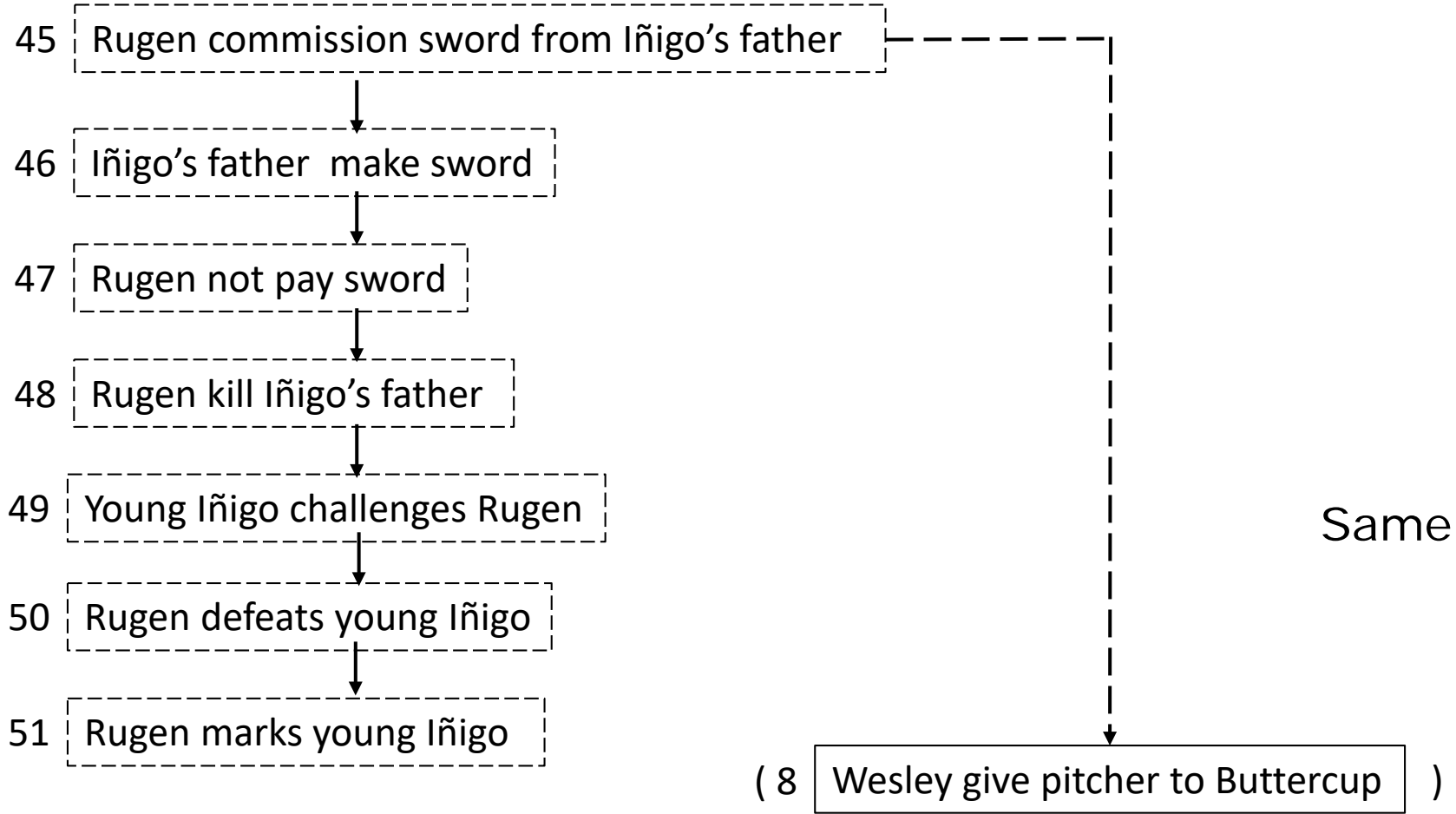
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Universe	Narrative Level	Action Unit ID	Mode	Relative Order			Action Subject	Action	Direct Object	Indirect Object	Place
B	1	42		41	meets	42	Inigo	show	sword	Man in Black	ruins atop the cliff
B	1	43		42	starts	43	Inigo	tell	45-51	Man in Black	ruins atop the cliff
B	2	45		45	precedes	8	6 fingered man / Count Rugen	order	sword	Domingo Montoya	smithy
B	2	46		45	meets	46	Domingo Montoya	accept	order	6 fingered man / Count Rugen	smithy
B	2	47		46	meets	47	6 fingered man / Count Rugen	neglect	payment	Domingo Montoya	smithy
B	2	48		47	meets	48	6 fingered man / Count	kill	Domingo Montoya		
B	2	49		48	meets	49	Inigo	challenge	6 fingered man / Count Rugen		smithy
B	2	50		49	meets	50	6 fingered man / Count Rugen	win	Inigo		smithy
B	2	51		50	meets	51	6 fingered man / Count Rugen	mark	Inigo		smithy
B	1	52		52	finishes	43	Inigo	challenge	Man in Black		ruins atop the cliff

Fictional world



42 Iñigo shows sword to Man in black

starts

43 Iñigo tells Man in black [45 - 51]

ends

45 Iñigo challenges Man in black

Universe	Narrative Level	Action Unit ID	Mode	Relative Order			Action Subject	Action	Direct Object	Indirect Object	Place
B	1	26		25	meets	26	Vizzini	kidnap	Buttercup		forest
B	1	27		26	starts	27	Vizzini	tell	28-35	Fezzik, Inigo	forest
B	2	28	plan	27	precedes	28	Horse	reach	Humperdinck		castle
B	2	29	plan	28	equals	29	Humperdinck	suspect	30		castle
B	3	30	suspicion	30	precedes	28	Guilderians	kidnap	Buttercup		forest
B	2	31	plan	25	precedes	31	Vizzini	kill	Buttercup		at Guilder's frontier
B	2	32	plan	31	meets	32	Vizzini	leave	Buttercup's body		at Guilder's frontier
B	2	33	plan	32	precedes	33	Humperdinck	find	Buttercup's body		at Guilder's frontier
B	2	34	plan	33	meets	34	Humperdinck	believe	34		at Guilder's frontier
B	3	35	belief	35	precedes	33	Guilderians	kill	Buttercup		at Guilder's frontier
B	1	36		36	finishes	27	Buttercup, Vizzini, Fezzik, Inigo	travel	ship		sea

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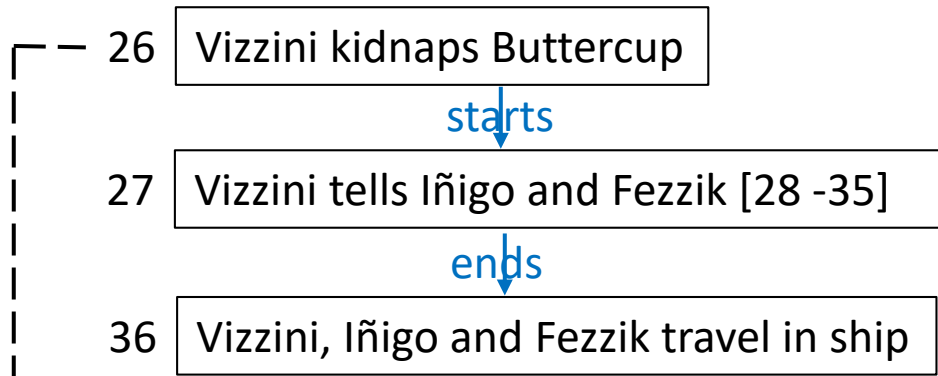
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# Fictional world



MODE: PLAN

MODE: SUSPECT

30 Guilderians kidnap Buttercup

28 Horse reaches castle

29 Humperdinck suspects 30

31 Vizzini kills Buttercup

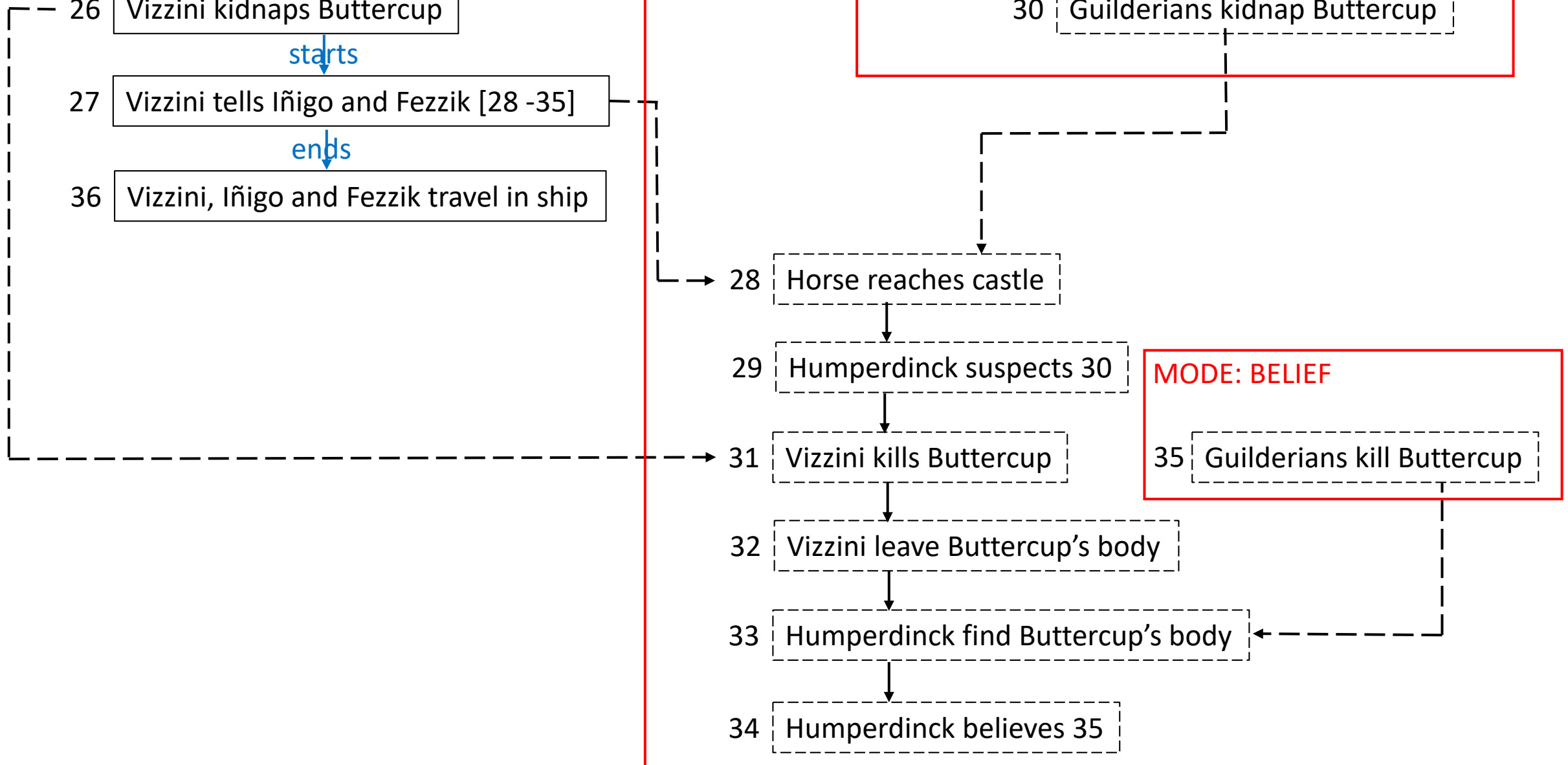
32 Vizzini leave Buttercup's body

33 Humperdinck find Buttercup's body

34 Humperdinck believes 35

MODE: BELIEF

35 Guilderians kill Buttercup



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## Conclusions

Relations between events in a story relevant to story understanding are not limited to chronology

Embedded stories sometimes induce jumps in relative chronology within the same world

Embedded stories allow the introduction of additional worlds (fictional?)

Introduction of additional worlds introduces separate timelines

Representation of modalities of reported speech may require additional worlds (possible rather than factual)

Relative chronology applies in a restricted fashion across possible and factual worlds

## Future Work

Extend to complete movie

Extend to other movies

Identify minimum set of features to account for relevant phenomena

Devise appropriate annotation format

Develop annotation guidelines

**Thank you!**

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