Causation in Semantics and Grammatical Structure

Week 5: Direct and indirect causation

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November 7, 2019

Recap

Lexical & productive causatives both describe causal situations, but differ structurally and semantically (in use and interpretation):

	Lexical	Productive	Exceptions
directness	direct	indirect	Yes
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Focus: direct vs. indirect causation

Direct vs. indirect causation: data

Lexical causatives are often bad in indirect contexts:

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b. #Floyd opened the door by telling Sally to turn the handle.

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- but seem less felicitous in direct situations if there's an available lexical causative:

(4) ?Floyd caused the glass to break by hitting it.

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- Last week: direct causation is a reflex of different constraints (on argument structure, etc; Neeleman & van de Koot 2012)
- Today: *direct causation* is a label for a particular construal of events, which is influenced by different factors (Wolff 2003)

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- so, the 'real' relation of causation is not linguistically encoded: the external argument is not *the cause*

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  - intervening events have to be *ceteris paribus*
  - apparent directness effects (e.g. Wild West example) can be explained) by constraints on volitionality/responsibility

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- both periphrastic and lexical causatives contain some semantic element, call it CAUSE, one of the features of which is to select for a CCF external argument
- we no longer need to define direct causation

Another approach to direct causation

Direct causation hypothesis: *paraphrased by Wolff (2003)*

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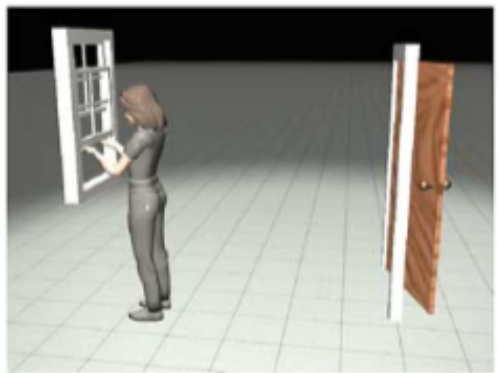

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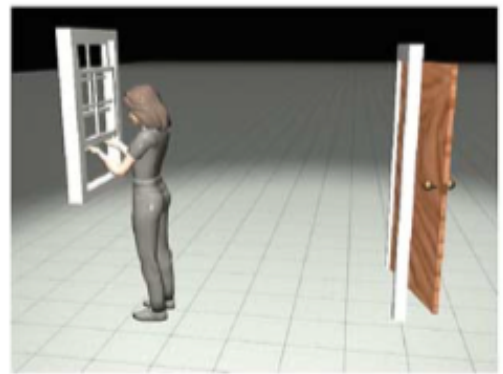

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Problem: it's difficult to evaluate the claim that lexical causatives only express direct causation because we don't have a good, non-circular way of defining direct causation

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5. conventionality, stereotypicality, prototypicality (Shibatani 1976, McCawley 1978, Lakoff & Johnson 1980)
   "the overwhelming proportion of [direct manipulations] share features of what we may call a **'prototypical'** *. . . case of direct causation?* (L&J)

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The no-intervening-cause criterion & hypothesis:

- the criterion specifies conceptual and perceptual conditions that amount to what we label 'direct causation'
- the hypothesis relates 'directness' to linguistic expression

Perception of direct causation

The no-intervening-cause criterion:
'Direct causation' is present between the causer and the final causee in a causal chain:

i. if there are no intermediate entities at the same level of granularity as either the initial causer or final causee, OR

ii. if any intermediate entities can be construed as enabling conditions rather than intervening causers

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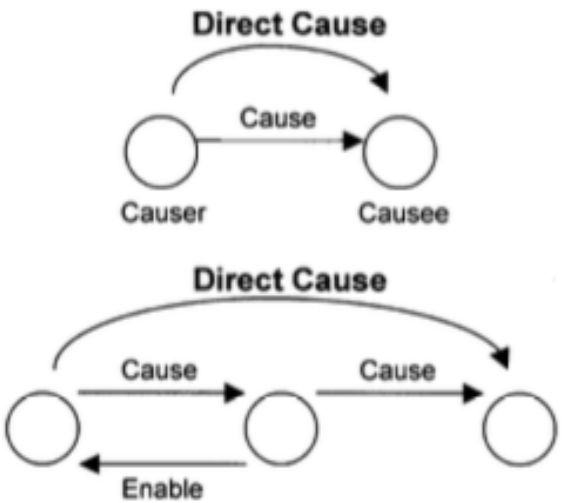

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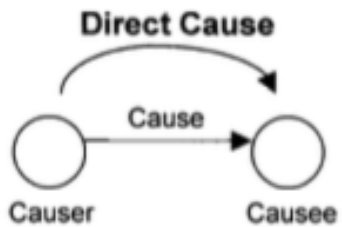

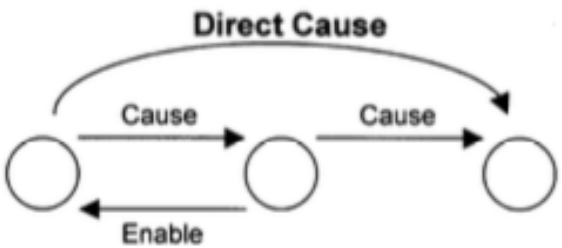

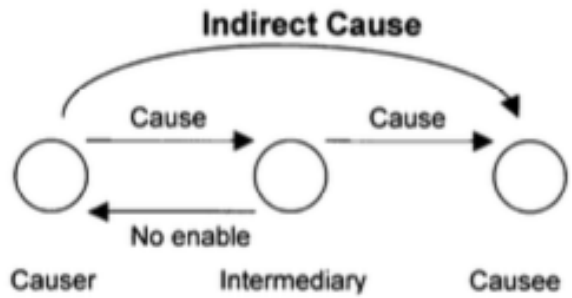

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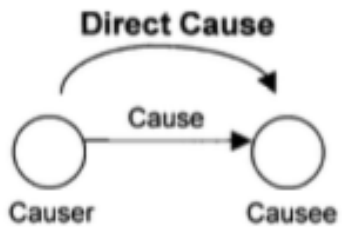

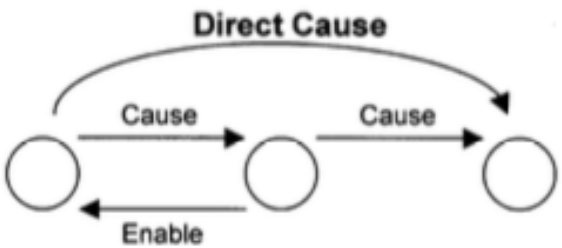

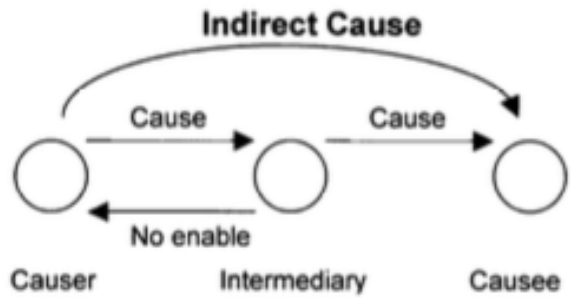

defined relative to Talmy's (1988) **force dynamics**

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- **force dynamics** is a theory involving **causal pluralism**
  - causation links objects
  - there is more than one type of link (not just CAUSE)
  - causal language specifies combinations of link types

Direct causation and linguistic expression

The no-intervening-cause hypothesis:

- the linguistic coding of causal chains is determined by direct causation (defined in terms of the no-intervening-cause criterion)
- in the absence of an intervening cause, a causal chain can be described by a single-clause sentence (lexical causative)

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  - note, e.g., that an *enabling* factor can also reasonably be counterfactually necessary

(7) Without gasoline, cars would not run.

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	Tendency of patient for the result	Opposition between affector and patient	Occurrence of a result
CAUSE	N	Y	Y
ENABLE	Y	N	Y
PREVENT	Y	Y	N

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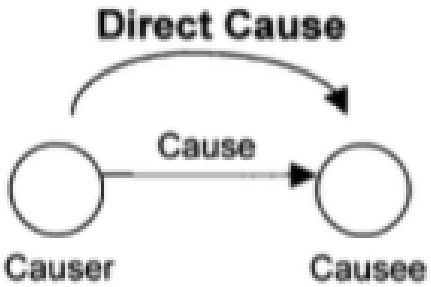
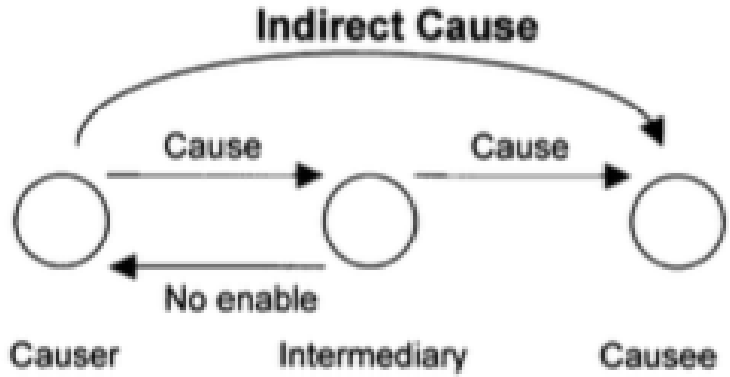
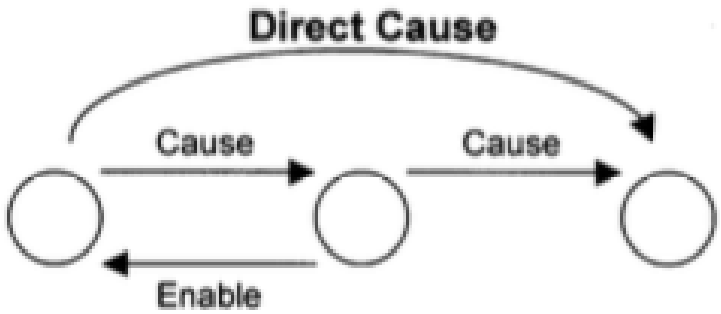
- the no-intervening-cause criterion & hypothesis specify additional features of the encoding
- lexical causatives only allow an additional CAUSE relation in the presence of a 'backwards' ENABLE relation







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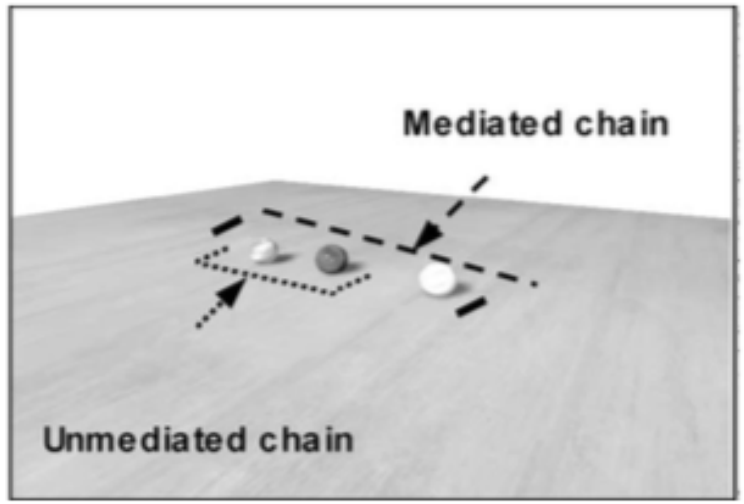
Wolff (2003): we can check the empirical appropriateness of the NIC condition & hypothesis with visual representations



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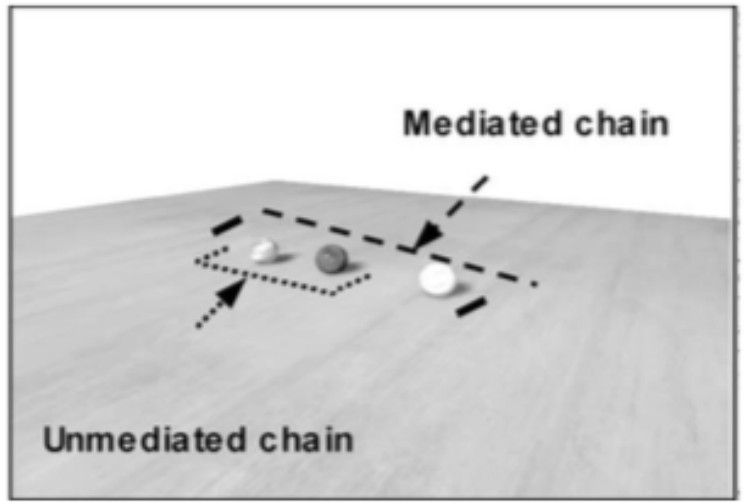

Predictions:

- direct: middle marble bumps smallest marble

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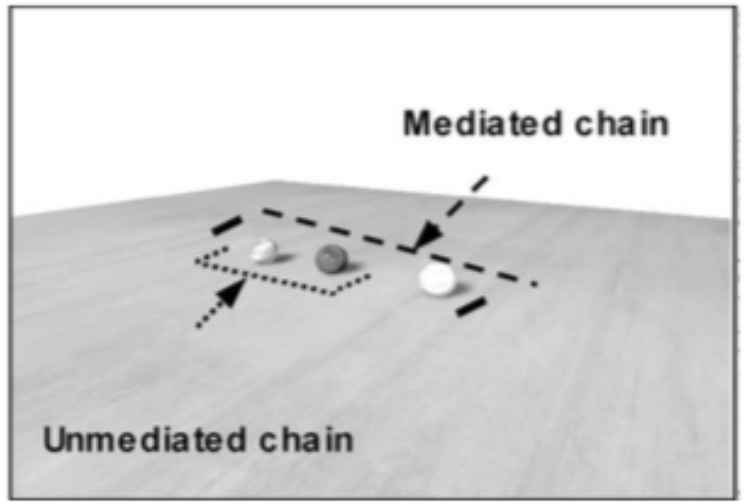

Predictions:

- direct: middle marble bumps smallest marble
- indirect: largest marble bumps (stationary) middle marble, which then bumps smallest one

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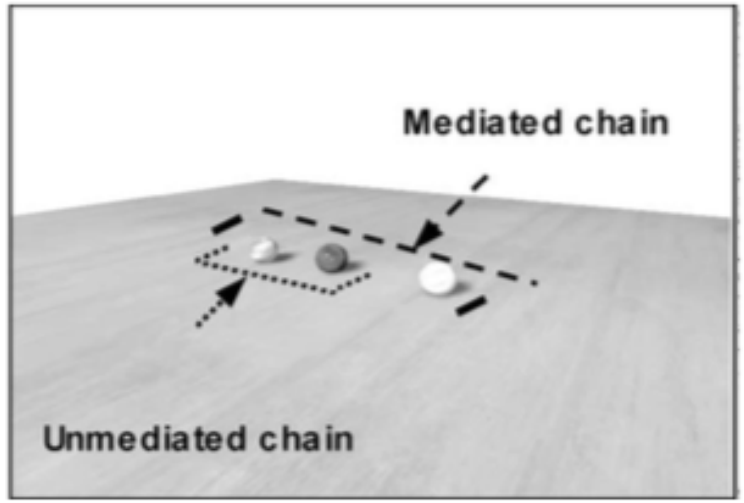

Predictions:

- direct: middle marble bumps smallest marble
- indirect: largest marble bumps (stationary) middle marble, which then bumps smallest one
- in the mediated case, the middle marble does the same sort of thing as the largest one, and is the same kind of object, so it counts as an intervening causer

Experiment 1: non-sentient causers

Materials/methods:

- 16 animations (4 scenarios, 4 perspectives each):
  - M1 $\rightarrow$ M2: direct hit/angled hit
  - M2 $\rightarrow$ M3: direct hit/angled hit
- verbs: *move*, *shift*, *relocate*, *budge*, *advance*
- participants choose 'best' description:

(8) a. The blue marble moved the green marble.
b. The blue marble made the green marble move.
c. Neither

- how many events occurred?

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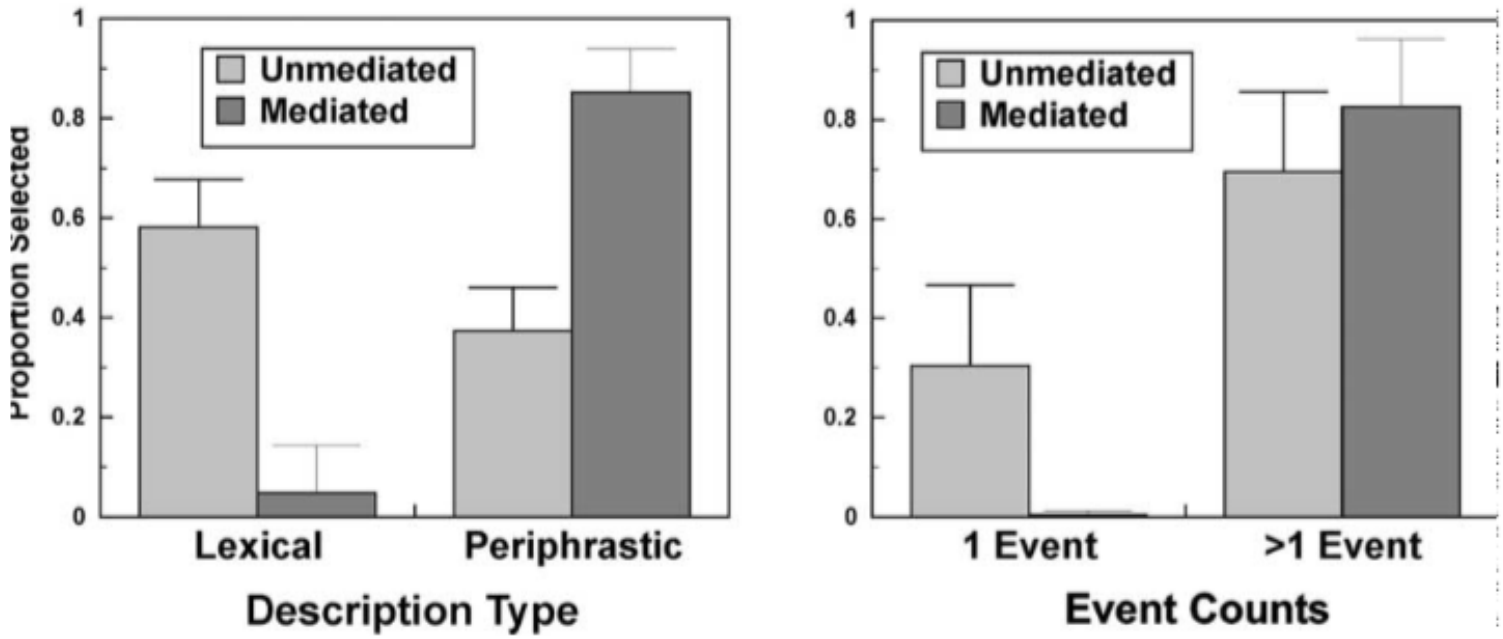
Basic predictions:

- lexical causatives more often in the unmediated case, less often in the unmediated case
- lexical causatives more frequently single events; periphrastics more often as two events

Experiment 1: Results



- predictions upheld:
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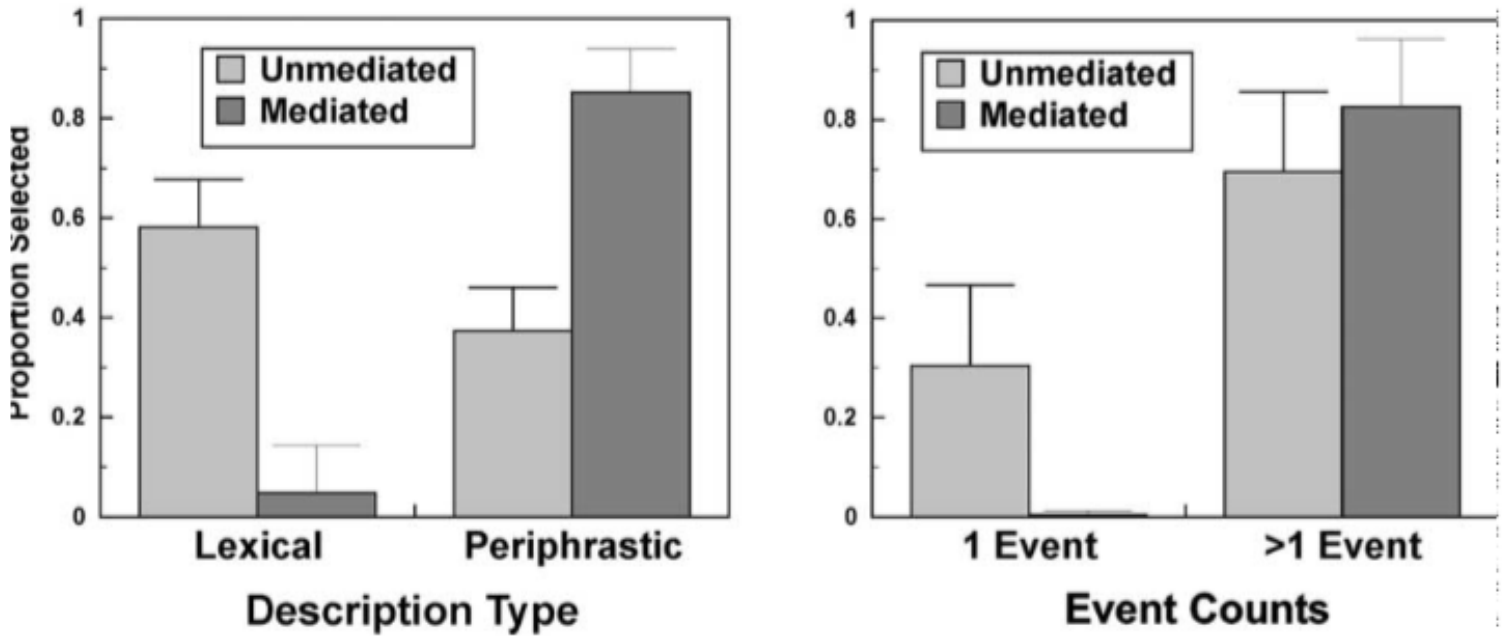

- predictions upheld:
  - lexical strongly preferred in unmediated situations, periphrastic in mediated
  - event counts mirrored linguistic choices
- **next tasks:** check more complex situations
  - cases where intermediary is causer vs. enabler
  - cases where intermediary differs in granularity

Experiment 2: enabling conditions and sentience

Idea: intermediaries often perceived as enablers if initial causer is sentient/intentional

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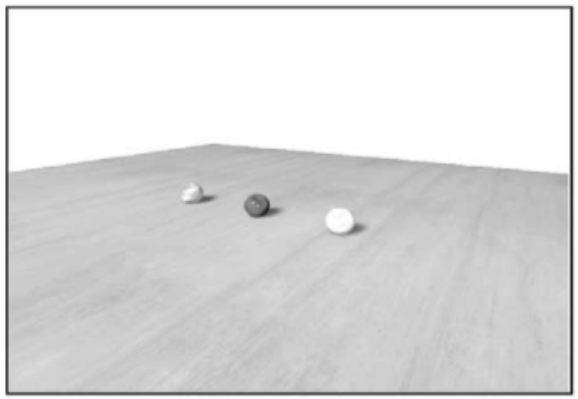

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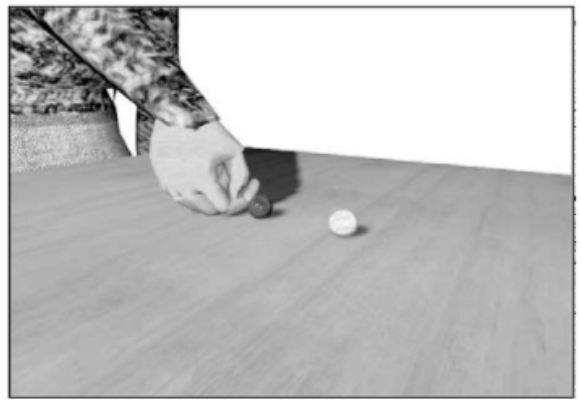
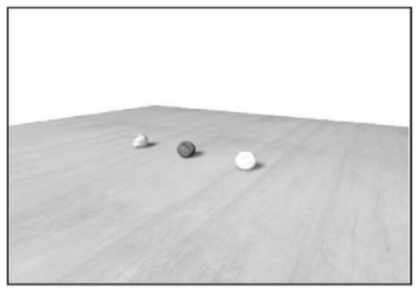


sentient initiator

Experiment 2: enabling conditions and sentience

NIC hypothesis: the chain will be perceived as direct if the intermediary (marble) is construed as an enabler, rather than a causer



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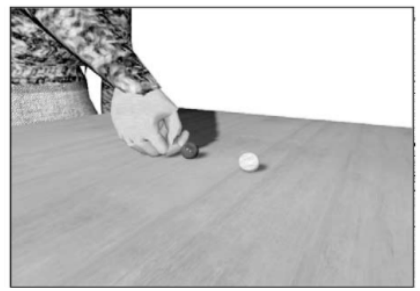

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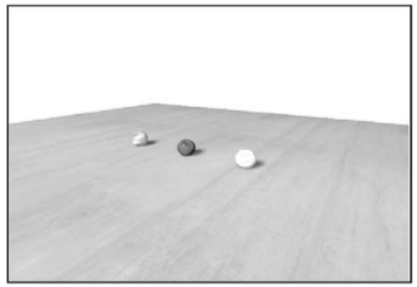

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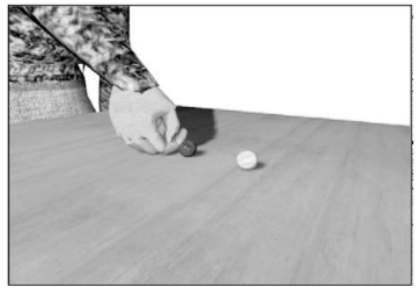

sentient initiator

Specific predictions:

- the chains involving the sentient causer will be described by lexical causatives more frequently than those that are purely mechanical (and mediated)
- event counts will reflect causative choice (lexical $\sim$ single, periphrastic $\sim$ dual)

Experiment 2: results

Visualizations:

- mechanical/non-sentient: mediated and unmediated (exp 1)
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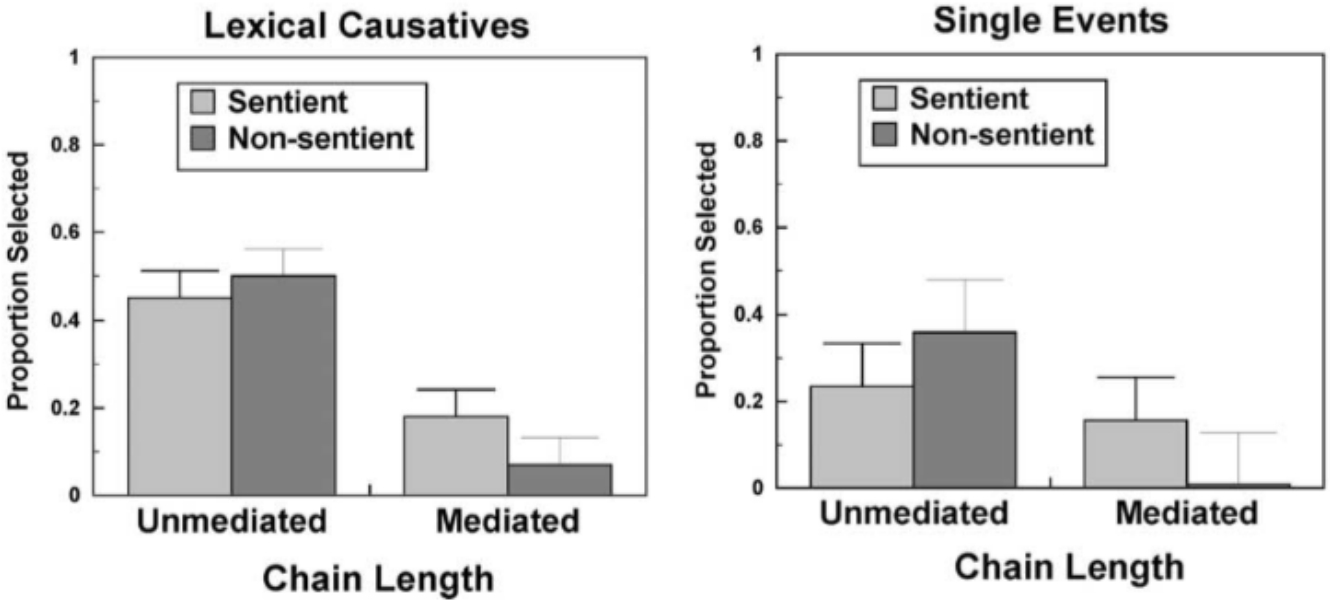

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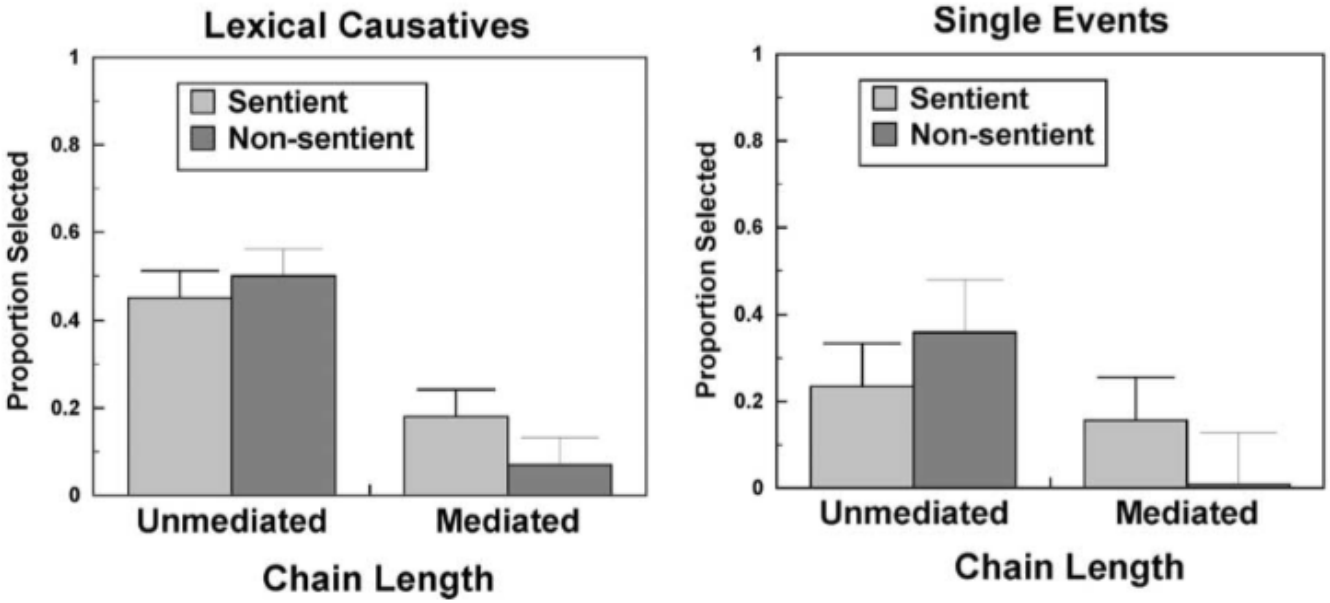

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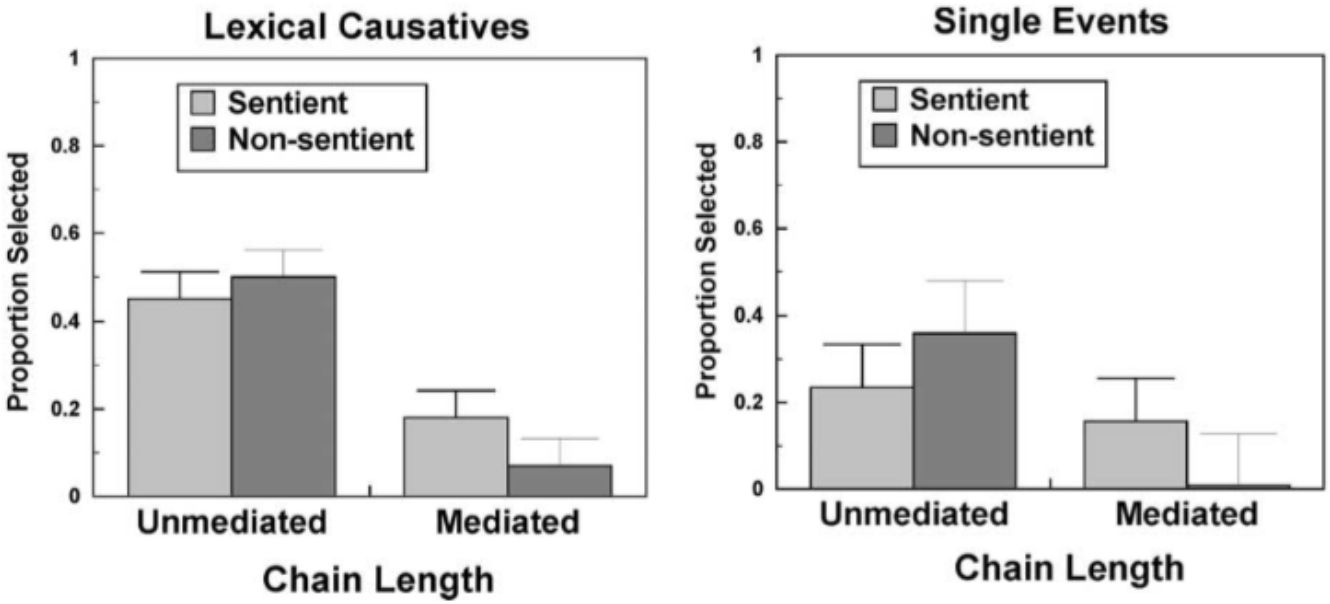

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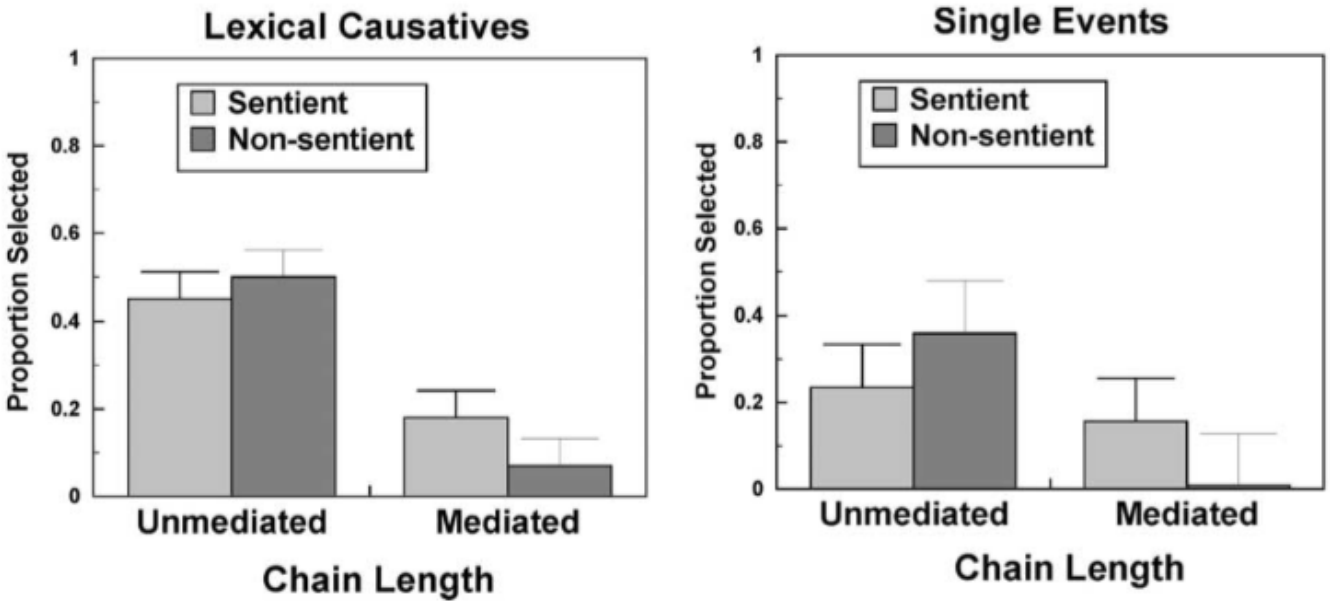

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Claim: the evidence for the importance of enabling conditions is indirect (since it was targeted via the sentience difference)

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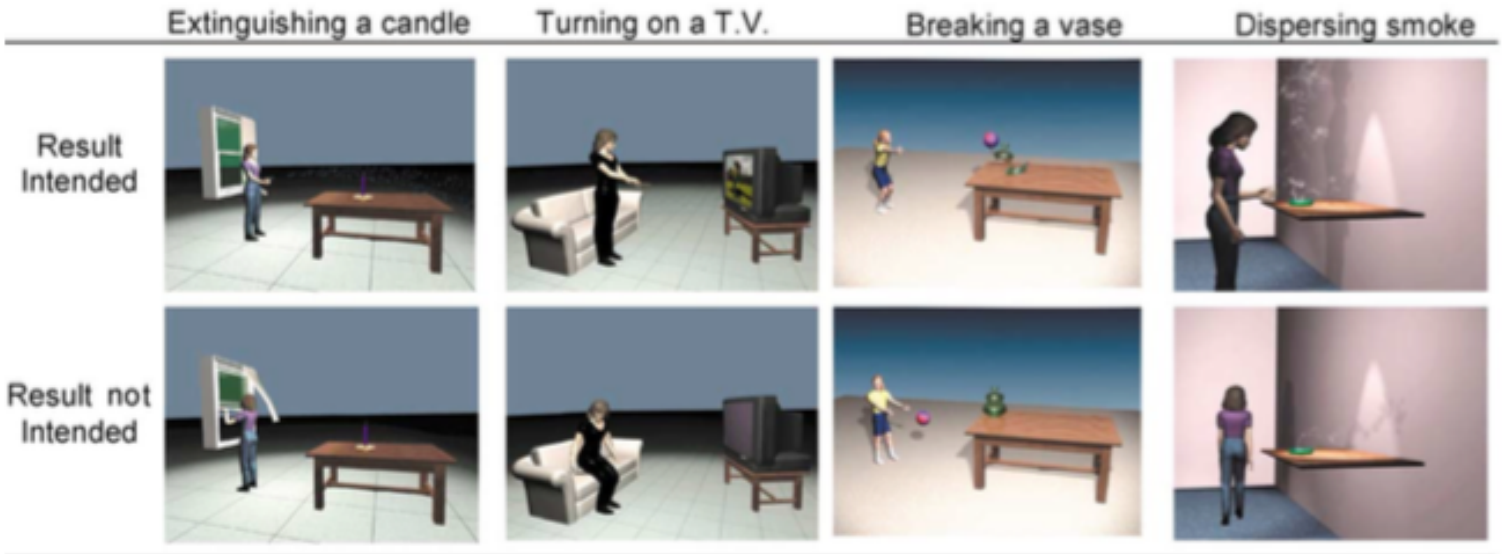
  - relationship between initial causer and intermediary
- NIC: intermediaries viewed as enablers will not block lexical causative descriptions

Experiment 3: intentions

Specific predictions:

- in intended chains, the intermediary will be perceived as an enabler, because it conforms to the causer's tendency (i.e., does what the causer wants it to do)
  $\rightarrow$ **so, intended chains more amenable to lexical causatives**
- intended chains more compatible with a single-event construal
- participants will use *enable* for role of intermediary



Experiment 3: materials

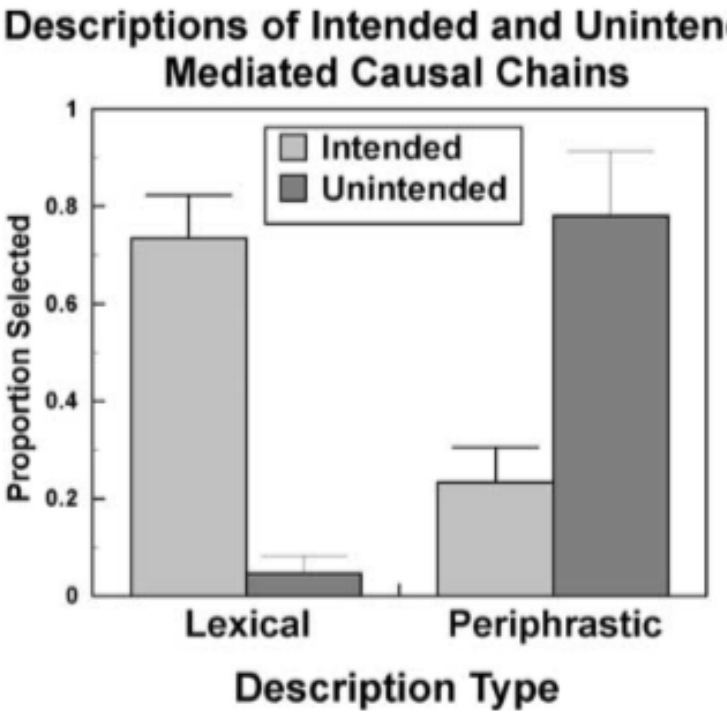
Examples:

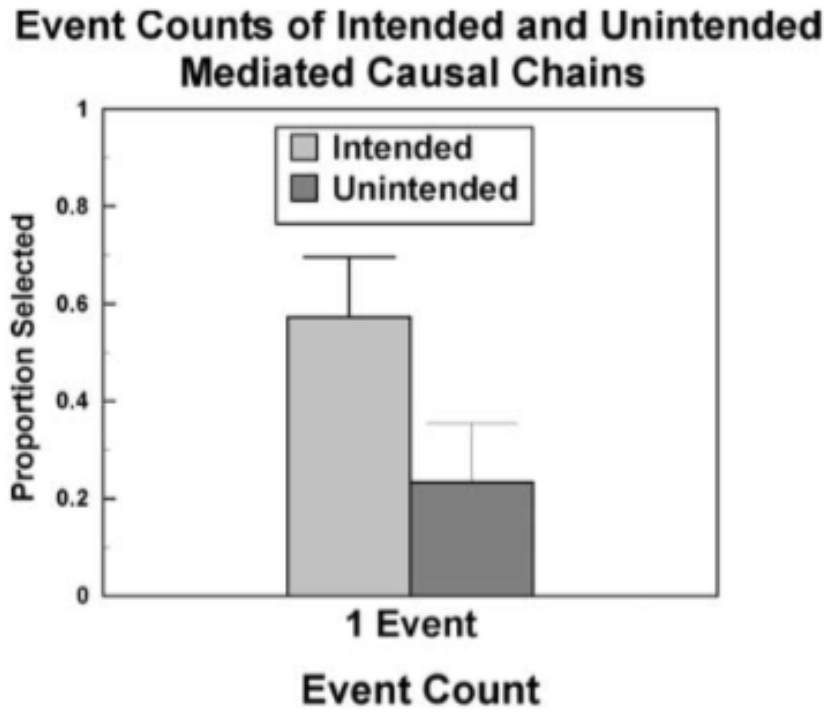
Intended	Unintended	Results	Stimuli
Girl throws ball at vase	. . . bounces ball on foot	Vase breaks	The girl broke the vase The girl caused the vase to break
Man places plate of butter on burner	. . . next to burner	Butter melts	The man melted the butter The man caused the butter to melt
Woman pushes dimmer switch	. . . toaster switch	Lights dim	The woman dimmed the lights The woman caused the lights to dim
Woman presses remote control	. . . sits on remote	TV turns on	The woman turned on the TV The woman caused the TV to turn on

Participants performed one of three tasks:

- choose linguistic description
- count the events: Y/N for single event
- judge the causer-intermediary relationship: 4 kinds
  - forward (initial causer $\rightarrow$ intermediary): cause or enable
  - backward (intermediary $\rightarrow$ initial causer): cause or enable

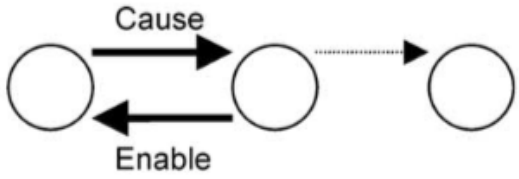
Experiment 3: results

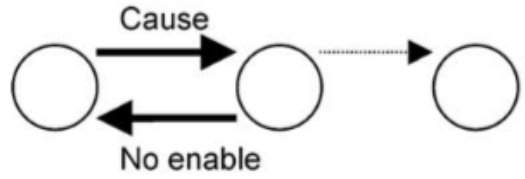


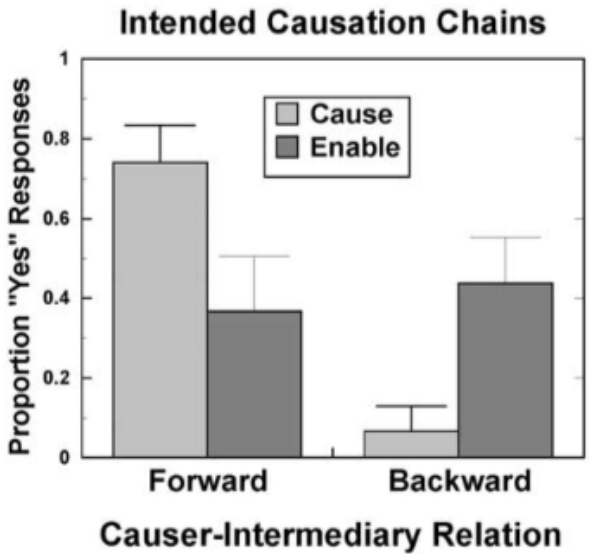


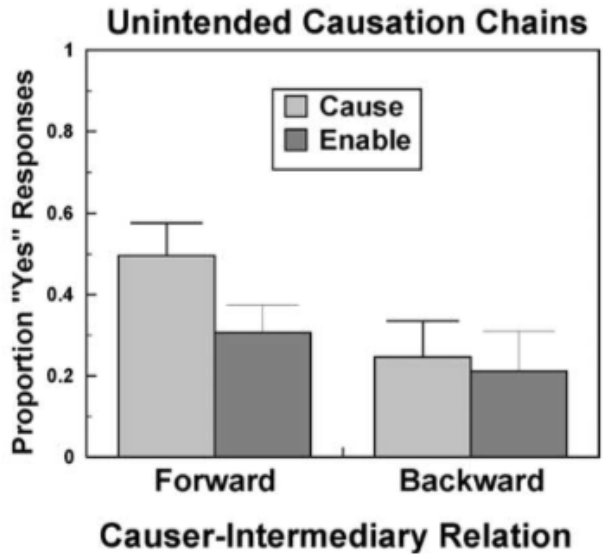
- strong effect of intention on lexical vs. periphrastic
- consistent with predictions/NIC hypothesis
- intended scenes $>$ 50% single event construals

Experiment 3: results









- causer $\rightarrow$ intermediary (forward link) more often viewed as *causing*, regardless of intention
- **key:** backwards link
  - intended: intermediary $\rightarrow$ causer was *enabling* more often
  - unintended: no significant difference

Experiment 3: caveats

Intention here is used as a proxy for directness:

- it might be necessary for directness in mediated chains
- it isn't sufficient: consider *directive* causation

(10) a. The mother had the children walk the dog.
b. $\not\equiv$ The mother walked the dog.
c. ?The children enabled the mother to walk the dog.

- intermediary's sentience matters, but also isn't the whole story:

(11) a. The Nelsons had the realtor sell their home.
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Question: Are the features of sentience/intentionality/manipulation, etc, part of the perceptual constraints on directness? Or can we explain the importance of these features as consequences?

- the granularity issue is not tested directly here

Causative alternation

Last two weeks:

- ways of trying to explain differences between causative types
- BUT: we started by considering the alternation between causative and inchoatives

  (12) a. The vase broke.

  b. The girl broke the vase.

- this led to the Lakoff/McCawley hypothesis about the derivation of lexical causatives, which we've seen both theoretical and empirical evidence against now
- **open question:** what links the causative and inchoative for verbs like *break*? Why is there a tight morphological relationship?
  - why do some verbs have this kind of alternation but others do not?
  - ultimately, does this tell us something more about the definition/perception of causation?

Next: the causative alternation