

Counterfactual conditionals with impossible antecedents

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Counterfactuals: two orthodoxies

Counterfactuals are conditionals like these:

- If Oswald hadn't shot Kennedy, someone else would've.
- If this table had been made of glass, it would've been heavier.
- If $2 + 2$ had been 5, Orwell would have used a different example.

They say how things **would have** been,
if some aspect of reality had been different.

Standard truth conditions come to us from Kratzer, Lewis, Stalnaker.

Let $\llbracket A \rrbracket$ be the set of possible worlds where A holds,
and let $A > B$ be the counterfactual from A to B .

KLS conditions

$$\llbracket A > B \rrbracket = \{w \mid f(w, A) \subseteq \llbracket B \rrbracket\}$$

Here, $f(w, A)$ is a set of worlds where A holds.

So $f(w, A) \subseteq \llbracket A \rrbracket$.

KLS conditions

$$\llbracket A > B \rrbracket = \{w \mid f(w, A) \subseteq \llbracket B \rrbracket\}$$

Since $f(w, A) \subseteq \llbracket A \rrbracket$,
we get that if $\llbracket A \rrbracket \subseteq \llbracket B \rrbracket$,
 $\llbracket A > B \rrbracket$ is the set of **all** possible worlds.

If $\llbracket A \rrbracket = \emptyset$, this is always the case.
So we have **vacuism**: all counterpossibles are true.

Vacuism doesn't seem right.

- If this table had been made of glass, it would've been heavier.
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- If $2 + 2$ had been 5, Orwell would have used a different example.
- If $2 + 2$ had been 5, Orwell would have used the same example anyhow.

At least one of each pair should be false.

Some vacuists **deny** these intuitions.

D.Lewis:

We have to explain why things we do want to assert are true (or at least why we take them to be true, or at least why we take them to approximate to truth), but we do not have to explain why things we do not want to assert are false. We have plenty of cases in which we do not want to assert counterfactuals with impossible antecedents, but so far as I know **we do not want to assert their negations either**. Therefore they do not have to be made false by a correct account of truth conditions; they can be truths which (for good conversational reasons) it would always be pointless to assert.

Others **explain away** the intuitions.

T. Williamson

[I]n our unreflective assessment of counterfactual conditionals, we use a simple heuristic along the following lines:

(HCC*) If you accept one of $A > B$ and $A > \neg B$, reject the other.

Williamson thinks we reject counterpossibles, when we do, because we have accepted their conjugates.

Some nonvacuists acknowledge **more circumstances** than just possible worlds.

Let $\langle A \rangle$ be the set of circumstances where A holds.

Modified KLS conditions

$$\langle A > B \rangle = \{w \mid f(w, A) \subseteq \langle B \rangle\}$$

Even assuming $f(w, A) \subseteq \langle A \rangle$,
this can give false counterpossibles.

A **CTIC** is a Counterfactual with a True Irrelevant Consequent.

That is, its consequent is **actually** true,
and has **nothing to do** with its antecedent.

- If Oswald hadn't shot Kennedy,
the Earth would have stayed in its orbit.
- If this table had been made of glass,
rats would (still) be mammals.

KLS-style theories predict CTICs to all be true, whether or not they stick to possible worlds.

$f(w, A)$ is meant to be the circumstances
most like w where A holds.

So if B is true at w ,
and whether or not A is true is irrelevant,
then B will still be true throughout $f(w, A)$.

- KLS approaches take all counterpossibles to be true.
- KLS-style approaches, even those that avoid the first prediction, take all CTICs to be true.

An experiment

- 121 participants, via Mechanical Turk.
- All with high reputation ($\geq 95\%$).
- Two did not complete and have been excluded.
- Each judged 10 counterfactuals: two each on five topics.

- Each topic had eight counterfactuals in play.
 - Antecedent quality: possible or impossible.
 - Consequent quality: positive or negated.
 - Relevance: relevant or irrelevant.
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- Each participant had one possible and one impossible antecedent for each topic; otherwise randomly selected.

Background

- The tallest building in the world is in Dubai, in the United Arab Emirates.
- The second tallest building in the world is in Shanghai, in China.

Sentences

- Antecedents:
'If Dubai and Shanghai had had the same name'
'If Dubai and Shanghai had been the same city'
- Consequents:
'the two tallest buildings in the world would (not) have been in the same city'
'mosquitoes would (not) have been extinct by now'

The topics featured different kinds of impossibility:

- Dubai/Shanghai false identity
- Twain/Clemens false distinctness
- Resolute Desk different constitution
- Primeness false mathematical
- Stephen Curry contrary properties

For each sentence, participants chose one of

DT: The sentence is definitely true.

PT: The sentence is probably true.

CS: I can't say whether the sentence is true or false.

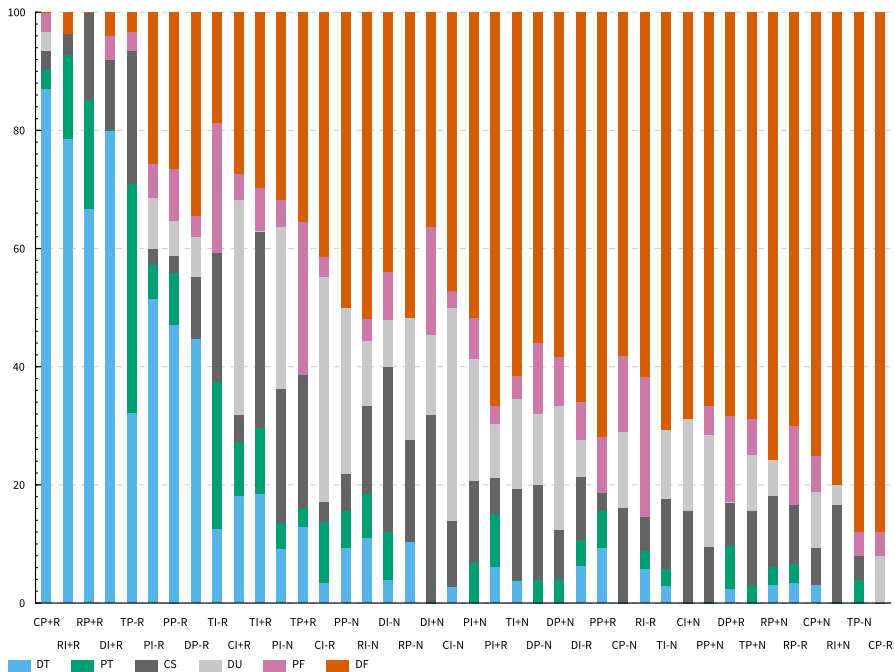
PF: The sentence is probably false.

DF: The sentence is definitely false.

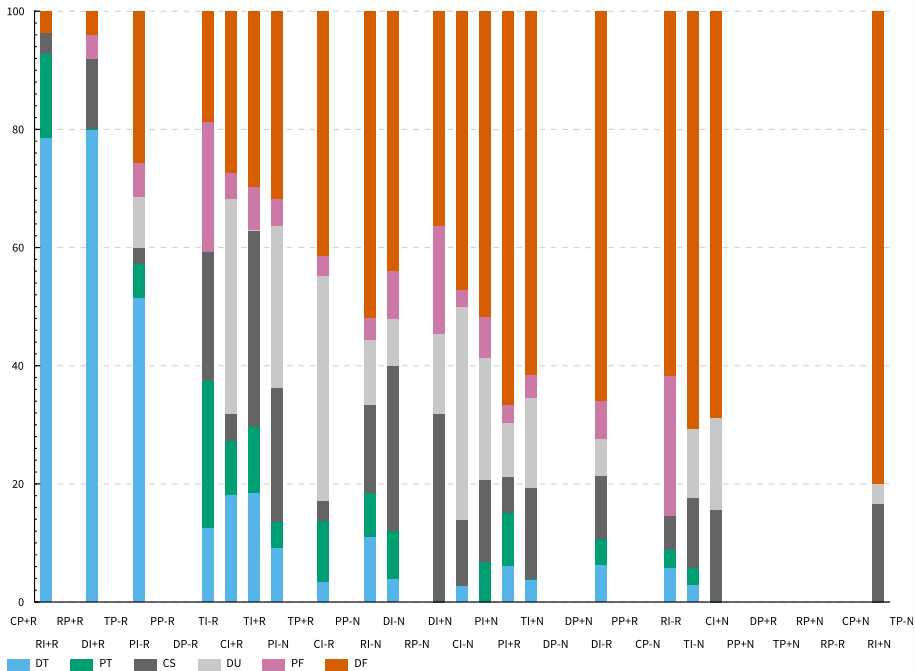
DU: I don't understand the sentence.

and gave a text explanation of their answer.

Results



Results



Responses are scored as follows:

DT: +1, PT: +.5, CS, DU: 0, PF: -.5, DF: -1

Count a sentence as having been judged true/false
iff its mean score is above +.5/below -.5.

- .8 If the Resolute Desk had been made of stone, then frogs would have been able to fly.
- .69 If Stephen Curry had been both exactly five feet tall and exactly six feet tall, then ants would have had ten legs.
- .66 If the Resolute Desk had been made of stone, then it would not have weighed any more than 500 pounds.
- .66 If Samuel Clemens hadn't been Mark Twain, then the Earth would not have spun out of its orbit.
- .61 If Dubai and Shanghai had been the same city, then the two tallest buildings in the world would not have been in the same city.
- .6 If Samuel Clemens hadn't been Mark Twain, then the Earth would have spun out of its orbit.
- .58 If fifteen had been prime, then it would have been evenly divisible by three.
- .52 If fifteen had been prime, then Paris would have been in Brazil.

These judgments don't fit Lewis's denial.

Nor do the explanations.

We don't get conversational reasons not to assert;
we get reasons to reject.

If Williamson's heuristic explanation is right,
judgments that counterpossibles are false are explained by
judging their conjugates true.

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Score	Conjugate
– .8	– .39
– .69	– .46
– .66	+ .82
– .66	– .6
– .61	+ .74
– .6	– .66
– .58	+ .26
– .52	– .23

Counterfactuals with antecedents irrelevant to their consequents do not fare well.

Of 20 irrelevant sentences, 13 are judged false.

The highest score any of the 20 gets is $-.23$.

(“If fifteen had been prime, then Paris would not have been in Brazil”)

They get as bad as $-.88$.

(“If Samuel Clemens had not been a writer, then the Earth would not have spun out of its orbit”)

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("If Samuel Clemens had not been a writer, then the Earth would not have spun out of its orbit")

Note that these are CTICs.

Of 10 CTICs, 4 are judged false.

In all cases, participants point directly to the irrelevance in explaining their judgments.

None are judged true: the best is $-.23$.

Upshots

Vacuism has some explaining to do.

Lewis's denial seems to have been mistaken.
Williamson's heuristic cannot explain the data.

But usual nonvacuists shouldn't start crowing.

CTICs don't seem to come out true either.

Perhaps the right thing to do is to explain these results away.

Partial fodder: “If Samuel Clemens hadn’t been Mark Twain” seems to have mainly been interpreted as about names.

But “If Dubai and Shanghai had been the same city” was not.

We might reject the KLS approach more thoroughly.

An **inferential** semantics might work:

Like:

$A > B$ is true (in c) iff:

B can be **correctly counterfactually inferred** from A
together with those facts held fixed in c .

This allows for both counterpossibles and CTICs to fail.
But it needs a story of correct counterfactual inference.

Standard theories of counterfactuals predict:
all counterpossibles are true, and all CTICs are true.

Even usual nonvacuist theories still predict
all CTICS are true.

There is a gap between these predictions
and the judgments reported here.