

What Does THAT Mean?
Experimental Evidence against the Principle of No Synonymy*

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1. The Principle of No Synonymy

1.1 *a difference in syntactic form always spells a difference in meaning* (Bolinger 1968): that is, there is no true paraphrase in natural language

1.2 Importance of the Principle:

Many grammatical theories and frameworks cite this as an axiom, in particular functionalist frameworks (e.g., Clark 1993; Croft 2001; Goldberg 1995; Langacker 1999).

2. Prima Facie Counterexample: Optional *That*

2.1 Non-Subject Extracted Relative Clauses

- (1a) This is the ball **that** I hit.
(1b) This is the ball \emptyset I hit.

2.2 Complementizers

- (2a) I think **that** the sky is blue.
(2b) I think \emptyset the sky is blue.

Terminology: We refer to the \emptyset form without THAT as the “ZERO” form.

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N.B. This is considered syntactic, not phonological, reduction: it’s sensitive to syntactic properties—subject-extracted relativizers are not optional:

- (3a) This is the ball **that** was hit for a home run.
(3b) *This is the ball \emptyset was hit for a home run.

3. Meaning-Difference Claims

3.1 Some have claimed that there *is* a meaning difference in optional THAT (Storms 1966; Bolinger 1972; Yaguchi 2001; Kaltenböck 2006, inter alia). We test some of these claims.

There is a range of meaning-difference claims. We focus on two claims from Yaguchi, chosen because they are:

- explicitly defined
- testable
- representative of claims in the literature

3.2 The Claims (Yaguchi 2001, inspired by Bolinger 1972):

Emotionality: THAT-forms are less emotional than the ZERO-forms.

- (4a) “I always believed **that** the press would kill her in the end.”
(4b) “I always believed \emptyset the press would kill her in the end.”

CLAIM: More emotional in 4b than 4a. (Also Storms 1966, Kaltenböck 2006)

Time Distance: THAT-form suggests greater temporal distance between the main clause and the embedded clause.

- (5a) He told me **that** he got divorced.
(5b) He told me \emptyset he got divorced.

CLAIM: Bigger time distance between when he told the speaker this and when the divorce occurred in 5a than 5b.

3.3 Yaguchi’s Explanation (from Jespersen 1933, also cited in Kaltenböck 2006): Residual deictic THAT leads to increased *distance*.

4. Our Problems with these Meaning-Difference Claims

4.1 Not tested systematically—mostly anecdotal justification

4.2 Based on delicate, potentially questionable linguistic intuitions

5. Two Experiments: Testing These Claims

Asked native speakers to rate meaning of sentences with/without THAT for:

- emotion with optional complementizer THAT
- time distance with optional complementizer THAT, and with optional relativizer THAT

6 Experiment 1: Emotion with Complementizers

6.1 Format

Complementizer Emotion Example

John and Mary were chatting at lunch about one of their colleagues. “I was surprised {that/Ø} he got in an accident,” John said.

On a scale of 1 to 9, with 1 being the least emotional and 9 being the most emotional, how emotional do you think John was when he said this?

6.2 Adverb “Controls”: 2 + 2 Design

	THAT	ZERO
No ADV	“I think that this is a bad idea,” he said.	“I think Ø this is a bad idea,” he said.
ADV 1	(n/a)	“I think Ø this is a bad idea,” he said calmly .
ADV 2	(n/a)	“I think Ø this is a bad idea,” he said angrily .

6.3 Details

24 items (6 in each of the four conditions), randomly mixed with 72 fillers (48 from experiment 2, and 24 true fillers). 40 subjects, mostly Stanford undergraduates, all native speakers of English.

6.4 Our Prediction:

Clear meaning differences in the adverb conditions, but no clear difference between the sentences with and without THAT.

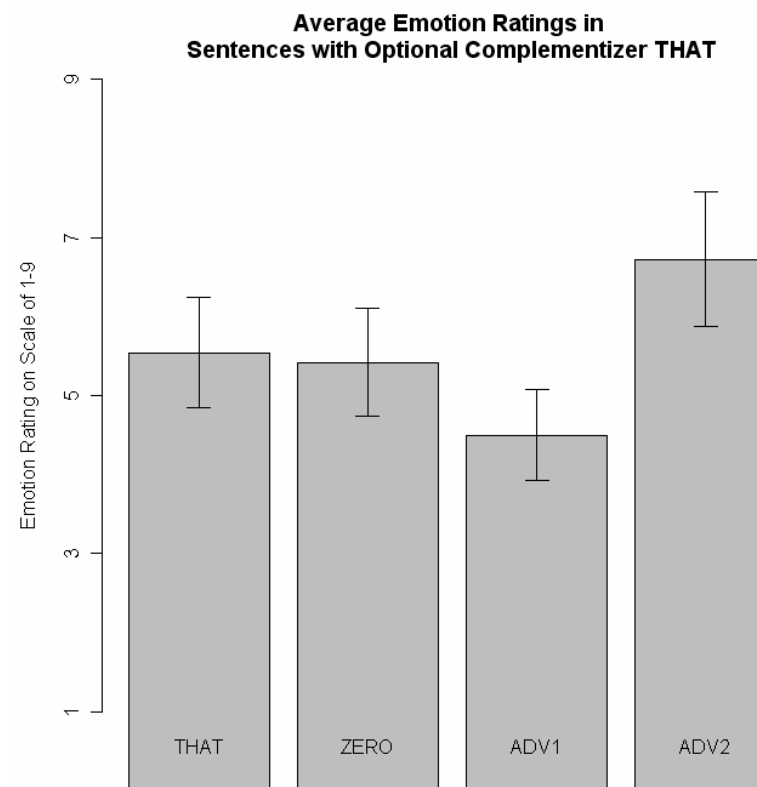
6.5 Results

Contrary to Yaguchi’s emotion claim, no statistically significant difference between ZERO and THAT; highly significant difference for the ADV controls, showing that the methodology can detect meaning differences.

ANOVA:

ZERO vs. THAT	ADV 1 vs. ADV 2
F1(1,39) = 0.8, p > 0.3	F1(1,39)=115.0, p < 0.0001
F2(1, 23) = 0.8, p > 0.3	F2(1,23) = 149.0, p < 0.0001

Chart 1



40 subjects with 24 items divided into 4 conditions; 95% confidence intervals

7. Experiment 2: Time Distance with Complementizers and Relativizers

7.1 Same Design as Experiment 1

Relativizer Time Example

"Have you ever been to Barcelona?" Melissa asked her colleague Ed at work. "Actually," Ed responded, "I'm planning on visiting Barcelona during the vacation *{that/Ø}* I'm taking to Spain."

Estimate as precisely as you can the time difference between when Melissa and Ed have this conversation and when Ed intends to go on vacation.

_____ Years _____ Days _____ Minutes

Time response was turned into total number of minutes, and then analyzed on a log-scale.

7.2 Controls

Adverbial controls were sometimes short phrases, such as "next week" vs. "this afternoon" instead of one-word adverbs.

7.3 Details

Given in same session as experiment 1: 48 items (24 relativizers, 24 complementizers), randomly mixed with the 24 items from experiment 1 and 24 true fillers.

7.4 Results:

No significant difference for THAT vs. ZERO, but highly significant difference for ADV 1 vs. ADV 2.

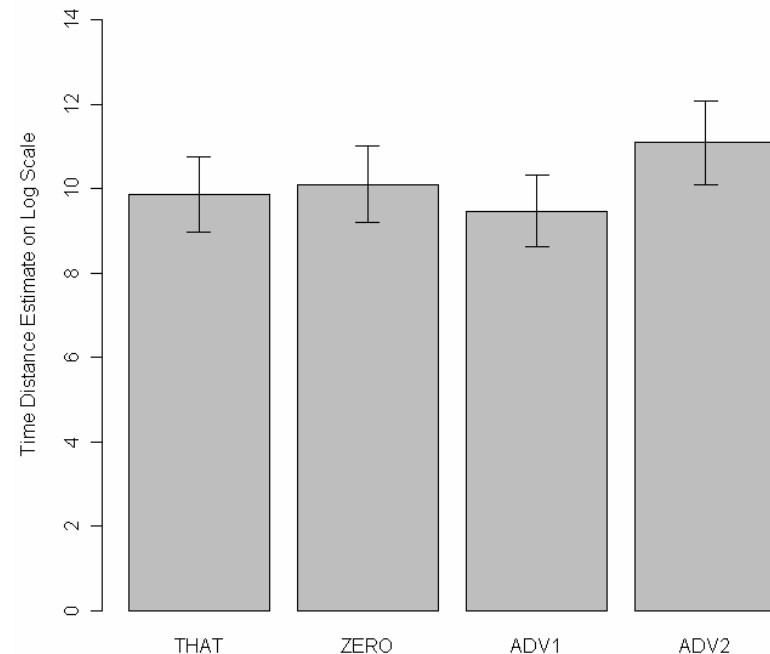
Analysis splitting up relativizer and complementizer cases does not differ qualitatively.

ANOVA:

THAT vs. ZERO	ADV 1 vs. ADV 2
F1(1,39) = .6, p > 0.4	F1(1,39) = 27.8, p < 0.0001
F2(1,47) = 2.2, p > 0.1	F2(1,47) = 87.5, p < 0.0001

Chart 2

**Average Time Distance Estimation
in Sentences with Optional
Complementizer or Relativizer THAT**



40 subjects with 48 items divided into 4 conditions; 95% confidence intervals

Note: in log-scale, 10 corresponds to approx. 15 days, 12 to approx. 4 months.

8 Discussion

8.1 What does this mean?

The significant differences in the adverb condition show that the methodology works for these types of meaning differences. And yet we find nothing for THAT vs. ZERO. So the claimed semantic effect of optional THAT for emotion & time-distance is either absent or extremely subtle.

These results suggest that the Principle of No Synonymy is not an inviolable constraint. Why, then, do both forms exist if not to express semantic difference?

8.2 An Alternative Explanation for the Phenomenon: Processing

Sometimes, it's really hard to understand sentences without the THAT:

- (6a) Go find the ball from my brother's school's playground **that** I hit.
- (6b) ?Go find the ball from my brother's school's playground \emptyset I hit.

Experimental and corpus research has found significant evidence for processing effects, for both production and comprehension (e.g., Ferreira & Dell 2000; Race & Macdonald 2003; Hawkins 2004; Jaeger 2006)

9. Potential Objections

9.1 Other Types of Meaning Differences

More claims in the literature—we did not test them all. But the burden of proof should be on those making the claims.

9.2 Too Subtle of a Semantic Effect

Cannot prove a null effect. But, again, the burden of proof should be on those making the claim.

10. Conclusion

This study finds no evidence for two of the claimed meaning differences between THAT and ZERO, thus buttressing a counterexample to Bolinger's principle.

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