



# What Does *That* Mean?

## Experimental Evidence Against the Principle of No Synonymy

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### Abstract

A foundational question of linguistics asks whether true synonymy can exist in natural language—that is, whether sentences of different syntactic form can truly have identical meaning. One *prima facie* counterexample to this hypothesis of no synonymy is the phenomenon of optional THAT: the sentences

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

differ in form but do not seem to differ in meaning. Some have argued that argued that there is indeed a subtle meaning difference between these sentences, yet they provide no more than anecdotal evidence. This study tested these meaning-difference claims empirically, finding no finding no evidence to support them. This questions the principle of no no synonymy, and suggests that a more nuanced approach must be taken to taken to account for the differing forms than this simple semantic account. account.

### Introduction

#### Principle of No Synonymy

Whether true paraphrase exists in natural language has been a foundational question in question in theoretical linguistics for decades. Bolinger (1968) famously proposed that proposed that “a difference in syntactic form always spells a difference in meaning,” a meaning,” a position directed against Chomsky’s (1955/1975) generative grammar, grammar, which posited shared deep structures between sentences with different forms different forms but seemingly identical meaning, such as:

- (1a) The dog chased the cat.
(1b) The cat was chased by the dog.

Various scholars from the functionalist paradigm have adopted Bolinger’s hypothesis— hypothesis—which, following Goldberg (1995), will be referred to as the Principle of Principle of No Synonymy—as axiomatic for their theories (Clark 1993; Croft 2001; 2001; Goldberg 1995; inter alia).

#### The Phenomenon: Optional THAT

One *prima facie* counterexample to this principle of no synonymy is the phenomenon of phenomenon of optional relativizer and complementizer THAT. When THAT serves as as a complement to verbs, it can often be omitted:

- (2a) I think **that** the sky is blue.
(2b) I think  $\emptyset$  the sky is blue. [ $\emptyset$  denotes a “zero” or omitted relativizer]
Similarly, when THAT serves as a relative pronoun in certain contents (when its its antecedent does not serve as the subject of the embedded sentence), it can be omitted:

- (3a) This is the ball **that** I hit.
(3b) This is the ball  $\emptyset$  I hit.

The two forms in these pairs seem to mean the same thing, contradicting the principle of principle of no synonymy.

### The Meaning-Difference Claims

Some have claimed that there is a meaning difference between these pairs with and and without THAT (Jespersen 1927; Storms 1966; Bolinger 1972; Yaguchi 2001, inter inter alia). Yet they present no more than anecdotal evidence in favor of the claims. claims. We focused on two of Yaguchi’s particular claims, as representative of the most the most easily testable meaning-difference claims in the literature: emotionality and emotionality and time-distance.

#### Emotionality

Yaguchi claims that the THAT-forms are less emotional than the NULL-forms. For For example, she cites two different newspaper quotations of Princess Diana’s father father after her death:

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

and claims that the Time journalist must therefore have interpreted the father as being being more emotional than the Newsweek journalist.

#### Time Distance

Yaguchi claims that presence of THAT suggests a temporal distance between the main the main clause and the embedded clause. Thus, in
(5a) He told me **that** he got divorced.
(5b) He told me  $\emptyset$  he got divorced.
according to Yaguchi’s theory, in the THAT-form there would be a bigger time distance distance between when he told the speaker this and when the divorce occurred.

### The Experiments

We tested these meaning difference claims.

We 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 relativizer THAT

For the emotion experiment, after reading the sentence as part of a longer paragraph, the paragraph, the experimental subject was asked how emotional the speaker was; for the for the time distance experiment, the subject was asked to estimate how the time gap gap between the main clause and embedded clause.

#### Example Experimental Item: Emotion

John and Mary were chatting at lunch about one of their colleagues. “I I surprised [that/empty] 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?

#### Example Experimental Item: Time

John was talking on the phone to his sister. “Yeah, I was talking to Bob I I told him [that/empty] I had divorced my wife recently.”

Estimate as closely as you can the time difference between when John was talking to Bob and when John divorced his wife.

There were four experimental conditions for each item: the first two conditions were the were the sentence with and without the optional THAT. The second two conditions conditions included an adverb that would clearly alter the meaning of a sentence; these sentence; these served as a control that our experimental paradigm could detect clear clear meaning differences when they did exist. In one of these conditions, the adverb adverb forced the meaning to {be more emotional/have more of a time gap} and in the and in the other, the adverb forced the sentence to {be more emotional/have more of a more of a time gap}.

### The Four Experimental Conditions

Table with 3 columns: No. Adv., THAT, ZERO. Rows include No. Adv., Adv. 1, and Adv. 2 with corresponding descriptions of the experimental conditions.

- 24 items (6 in each of 4 conditions) for emotion experiment
•48 items for time distance experiment (24 complementizers, 24 relativizers)
•24 fillers
•Experiments performed on a computer
•40 subjects, mostly Stanford undergraduates, all native English speakers

### Predictions

There will be clear meaning differences in the (control) adverb conditions, but none none between the sentences with and without THAT.

\*This poster represents work done in collaboration with T. Florian Jaeger Jaeger and Tom Wasow; a version of this was presented in Kinsey et al. al. 2007.

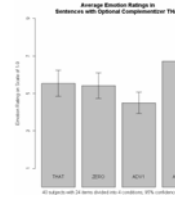
This research was funded through a Chappell-Lougee Scholarship from the from the office of Stanford’s Undergraduate Research Programs.

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### Results

As expected, we found no statistically significant difference between the sentences with sentences with and without THAT but did find an extremely significant difference for difference for the adverb-control conditions, for both experiments.

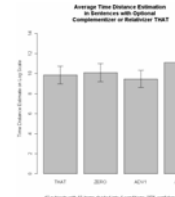
#### Experiment 1: Emotion



ANOVA Analysis table for Experiment 1: Emotion, comparing ZERO vs. THAT and ADV 1 vs. ADV 2 with F and p values.

ANOVA Analysis

#### Experiment 2: Time Distance



ANOVA Analysis table for Experiment 2: Time Distance, comparing ZERO vs. THAT and ADV 1 vs. ADV 2 with F and p values.

ANOVA Analysis

N.B. The analysis when splitting up relativizers and complementizers does not not differ qualitatively.

The times were analyzed on logarithmic scales.

### Discussion

Given the clear effects in the control conditions, the claimed semantic effect of optional optional THAT for emotion & time-distance is either absent or extremely subtle.

The meaning difference might be too subtle for our experiment to detect—but where is the where is the burden of proof?

This suggests that the Principle of No Synonymy is not an inviolable constraint. So, why do why do both forms exist if not to express a semantic difference?

#### An alternative explanation: 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 effects, for both production and comprehension (e.g. Jaeger 2006).

### Conclusion

This study finds no evidence for two of the claimed meaning differences differences between THAT and ZERO, thus buttressing a counterexample counterexample to Bolinger’s principle. The burden of proof is on those those claiming that there is a meaning difference.

#### References

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