

Multiple That: A strategy for reducing integration costs  
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When people encounter the word *that* in a sentence like (1), they formulate expectations about what will come next. Once they know that they're entering a complement clause (CC), they expect that this clause will have a subject and a verb.

1) I told him **that** for sure Dan and I would be around tomorrow afternoon for lunch.

In examples like (2) (Multiple That examples), a second complementizer appears before the subject of the CC:

2) I told him **that** for sure **that** Dan and I would be around tomorrow afternoon for lunch.

Although this complementizer does not provide any new information, and sounds ungrammatical to many people, it may have a function; the extra *that* may be a strategy for reducing integration costs in the CC.

Gibson's Dependency Locality Theory states that the cost of integrating an element increases as a function of its distance from the element it connects to (Gibson 2000). This suggests that when an adverbial (like *for sure* above) intervenes between the complementizer and the subject of the CC, the integration costs at the subject and the verb will be greater for longer adverbials.

Although it can't predict that extra *that* is helpful overall (because it is ungrammatical and may be hard to process itself), the DLT predicts an interaction between the effects of having an extra complementizer and of the length of the adverbial. Because the extra *that* is closer to the items to be integrated than the original complementizer, its presence should reduce integration costs in the CC. In cases with a long adverbial the costs to be reduced are high, and in cases with a short adverbial they are low, making the extra *that* more helpful when the intervening adverbial is long than when it is short.

To test this prediction, we conducted a self-paced reading study of Multiple That sentences. Twenty-three university students read sentences one word at a time in a moving window display and answered a comprehension question about each sentence. Reading times of >1000ms were removed (<1% of all observations).

Reading times were measured in two regions: the subject of the embedded clause (Subject) and the first three words of the VP in the CC (VerbRegion). The items were divided into bins by length of adverbial (Long or Short), and minimally paired for whether they contained an extra *that* (ExtraThat or NoExtraThat).

A 3-way repeated measures ANOVA (Region x Length x That) showed a significant 2-way interaction between length of the intervening adverbial and presence of an extra *that* ( $F(1,22)=4.38, p<0.05$ ). The extra *that* had a significantly more positive effect on sentences with long adverbials than on those with short adverbials (see Tables 1 and 2).

This suggests that although it adds no new information, the extra *that* in Multiple That examples is an effective strategy for reducing integration costs in the complement clause.

Table 1.

Subject	ExtraThat	NoExtraThat
Short	313 (18) ms	292 (16) ms
Long	284 (18) ms	294 (15) ms

Table 2.

VerbRegion	ExtraThat	NoExtraThat
Short	297 (15) ms	280 (12) ms
Long	283 (14) ms	283 (14) ms