syntactic “islands”: Why is a better?

a What did J think that M bought?
b factive: What did J know that M bought?
c manner: What did J whisper that M bought?

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In four acceptability judgement experiments, we found that verb-frame frequency offers the best explanation, as compared to syntax, semantics and discourse-based proposals.
Theory 1: extra nodes in syntax (e.g. Kiparsky & Kiparsky, 1971)

In factive and manner-of-speaking verbs, there is extra structure crossed in wh-movement, leading to ungrammaticality:

What did J whisper \([NP \ [S\ that\ Mary\ bought\ __]]\)  
What did J know \([NP \ [S\ that\ Mary\ bought\ __]]\)  

Theory 2: The lower acceptability of extractions across factive verbs may be because presupposition does not allow extraction (Kiparsky & Kiparsky, 1971)

What did J know \([NP \ [S\ that\ Mary\ bought\ __]]\) ?  
What did J discover \([NP \ [S\ that\ Mary\ bought\ __]]\) ?  

Theory 3: Perhaps complements of factive and manner-of-speaking verbs are more backgrounded:

Backgrounded Constituents are Islands (BCI):  

Backgrounded constituents may not serve as gaps in filler-gap constructions (Ambridge & Goldberg, 2008).
A&G test of backgroundedness: the more backgrounded a constituent, the less likely that sentential negation can fall on it

I didn’t think that M bought a car. can entail
M didn’t buy a car. 

but
I didn’t know/whisper that M bought a car. 
does not entail...

Theory 4:
Verb-frame Frequency: (cf. Dabrowska, 2008)
Acceptability depends on (i) the frequency of the construction (wh-question vs. declarative) and (ii) the frequency of the verb head-structure = P (matrix verb) * P (sentence complement | matrix verb)

According to the verb-frame frequency hypothesis, there is nothing special about wh-extraction structures, other than being lower frequency constructions. The same patterns of acceptability are expected in declaratives as wh-questions (or other extraction structures)
Predictions of the four theories:

declarative, bridge / factive / manner: Susan thought / knew / whispered that Anthony liked something.
wh-question, bridge / factive / manner: What did Susan think / know / whisper that Anthony liked?

here are the verbs in E1:

"Bridge" verbs: say, decide, think, believe, feel, hope, claim, report, declare
Factive verbs: know, realize, remember, notice, discover, forget
Manner-of-speaking verbs: whisper, stammer, mumble, mutter, shout, yell, scream, murmur, whine
Experiment 1 results n = 120. These results are far from what the syntactic and semantic theories predict. The predicted interactions aren’t close to being there.
To evaluate backgrounded-ness, we ran A&G’s negation test (n=60). The background account predicts a correlation between negation score and the difference in acceptability for the wh-question and declarative versions. We did not find a reliable correlation $r=-0.31$, $p=0.13$. 
The Verb-frame Frequency Hypothesis was supported: In an ordinal regression, we found strong effects of construction (declarative rated better than wh-question $\beta = -1.40, Z = -7.04, p < 0.001$) and verb-frequency ($\beta = 0.50, Z = 5.89, p < 0.001$), with no interaction.
There are 3 further experiments, all showing strong effects of construction (declarative vs wh-question or cleft) and verb-frequency, using either a 5-point rating scale or a binary acceptability rating scale.

Open question: why is it that the embedding verb matters so much in the acceptability of these materials? Do all words contribute similarly?

In addition, we found that the widely adopted approach in our field - application of linear models to Likert-scale acceptability data - can lead to false positives, especially for data skewed towards one end of the scale.