

Non-Canonical Question Intonation in American English

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1. Introduction

- It is widely assumed that yes-no questions in English tend to rise intonationally, while wh-questions tend to fall.
- In previous work, my colleagues and I confirmed this pattern in two corpus studies of American English.
- In that work, we reported on the pragmatic meanings conveyed by non-canonical intonational patterns on yes-no questions and wh-questions.
- Here I compare the inquisitive semantics account of non-canonical question intonation that we proposed before with a compositional semantics account that I look at for the first time now.

2. Data, methods and coding

- Our data came from the Callhome Corpus of American English (telephone conversations between people who know each other) and the Fisher [American] English Corpus (telephone conversations between people who do not know each other).
- We analyzed 410 yes-no questions and 200 wh-questions.
- The intonational notation was done using the ToBI system for American English.

2. Data, methods and coding

- ToBI tone categories that we used:
 - Pitch accents
 - H^* , L^* , $L+H^*$, L^*+H , $!H^*$
 - Edge tones:
 - Phrase accents: $L-$, $H-$: intermediate phrase.
 - Boundary tones: $L\%$, $H\%$: intonational phrase.

3. Prosodic annotation

- Final contour seems to be the major prosodic signal of question meaning.
- The vast majority of yes-no questions are pronounced with some kind of rise (373/410, or 91%).
- The vast majority of wh-questions are pronounced with some kind of fall (162/200, or 81%).

3. Prosodic annotation: Yes-no questions





Nuclear contour	Percentage	ToBI category	Total N
Low-rise	79.8%	L*H-H%	325
		L*L-H%	2
High-rise	10.7%	H*H-H%	39
		!H*H-H%	5
High-fall	2.4%	H*L-L%	9
		!H*L-L%	1
Rise-fall	1.7%	L+H*L-L%	7
Low-fall	1.5%	L*L-L%	6
Fall-rise	0.5%	H*L-H%	1
		L+H*L-H%	1
Level	3.4%	H*H-L%	9
		!H*H-L%	3
		L*+HH-L%	2
Total	100%		410

3. Prosodic annotation: Wh-questions

Nuclear Contour	Percentage	ToBI Category	Number
High Fall	49.0%	H*L-L%	64
		!H*L-L%	34
Rise Fall	25.0%	L+H*L-L%	44
		L+!H*L-L%	6
Low Fall	7.0%	L*L-L%	14
Low Rise	13.5%	L*H-H%	26
		L*L-H%	1
High Rise	2.0%	H*H-H%	3
		!H*H-H%	1
Fall Rise	1.0%	H*L-H%	2
Rise-Fall-Rise	1.5%	L+H*L-H%	2
		L+!H*L-H%	1
Level	1.0%	H*H-L%	1
		H*!H-L%	1
TOTAL			200

3. Prosodic annotation: Canonical yes-no questions

- There are 327 low-rises, or 79.8%.
- Often these are pronounced with a downstepped head followed by a low-rise nucleus:

- Can you **swim**?
L*H-H% 
- Is **Matt** through **school**?
H* L*H-H% 
- Do **you** still **work** for a **veterinarian**?
H* !H* L*H-H% 
- And **do** you have **time** to go **out** and- and **see** them and **enjoy** them?
H* !H* !H* L* H- L*H-H% 

4. Falling yes no questions

- Banuazizi & Cresswell (1999) classified yes-no questions that fail to conform to one or more of the felicity conditions of the question speech act as “non-genuine” questions.
 - a. The speaker S must not already know, or believe she knows, the answer to the question she is asking the hearer H.
 - b. S must desire a response from H.
 - c. S must believe that H can provide a response.

4. Falling yes-no questions

- They listened to 3,789 yes-no questions from the Switchboard Corpus and found that 217 or 5.7% were falling. 191/217 falling questions were non-genuine, or 88%.
- We found that 23/410 or 5.6% were falling. 22/23 falling yes-no questions were non-genuine, or 96%.
- We took a random sample of 100 low-rise yes-no questions and found that only 12% were non-genuine.

4. Falling yes-no questions

Category of Question	Falling questions	Low rise questions
Expected response is something other than yes/no.		
Introduction of the assigned topic.		
Introduction of new topics within the conversation.	2	1
Requests couched in question form.	4	
A particular response is clearly expected.	8	4
Discourse markers.	2	1
Conversation management.		
Quoted or reported questions, or questions in citation form.	2	
Questions followed immediately by another clause.	1	5
Correction question.		
Jokes.	1	
Information couched in question form.	2	1
Questions to self.		
Genuine question.	1	88
TOTAL	23	100

4. Falling yes-no questions

- (1) is a request for action instead of information, (2) is an announcement, (3) is a discourse marker, and (4) is an example of a question in which a particular answer is clearly expected.

(1) Can we **talk** about the **job** things now?

H*

L*L-L%



(2) Did I **tell** you that I have a new **job**?

L+H* !H*

!H*

L*L-L%



(3) Is **that** right?

L*L-L%



(4) Do you have a **cold**?

H*L-L%



4. Falling yes-no questions

- We concluded from this study that yes-no questions have non-canonical, falling intonation when the speaker is not conforming to the felicity conditions for questions, i.e. when the question is “non-genuine”.

5. High-rise yes-no questions

- 44/410 or 10.7% of yes-no questions were annotated with a high rise (H*H-H%).
- We couldn't find a distinct function for these questions.
- But we did notice that many of these H* pitch accents occur on words of the type that would often be left unaccented at the end of the intonation phrase:
 - Pronouns
 - Function words, e.g. some adverbs.
 - Second word of a compound noun.

5. High rises: Possible post-nuclear accents

(5) So **have** you been **able** to get **close** to them?

H* !H* L*H-H%



(6) Do you **know them**?

L* H*H-H%



(7) Can **you believe** that?

H* L*H-H%



(8) Could there **be a reason** for **that**?

L* L*+H H*H-H%



5. High rises: Possible post-nuclear accents

(9) Did you **get** my **letter** yet?

L+H* L*H-H%

(10) Did **she enjoy** **coming visiting** here?

H* L*HH% H* L*+H !H*H-H%

(11) Did I **send** it to **you** on **computer** paper?

H* !H* L*H-!H%



(12) Do y- would you like an **area code**?

L*+H H*H-H%



5. High rises: Post-nuclear accents

- Our hypothesis:
 - Some **L*H-H%** questions in American English associate the H- phrase accent with a post-nuclear stressed syllable, giving rise to an apparent **H*H-H%** tune, but where the pitch accent is really a “post-nuclear accent”.
- Grice, Ladd, Arvaniti 2000
 - In the Rise-Fall Question Tune of Greek, Romanian : **L*H-L%**
 - H- phrase-accent peak is attracted to a post-nuclear lexically stressed syllable if there is one, giving rise to a post-nuclear accent.
- Lickley, Schepman, Ladd 2005.
 - In the Fall-Rise Question Tune of German, Dutch: **H*L-H%**
 - L- phrase accent tone is associated to both a post-nuclear lexically stressed syllable and the final syllable.

5. High rises: Near-minimal pairs

(13) Did you **get** my **post** card?

H* !H*H-H%

(14) Did you **get** her **post card**?

L* L* H*H-H%

(15) 1096.37 1099.60 B: eh Lizzy Lizzy everybody feels that way whose worth his salt.

1097.98 1099.00 A: (())

1100.06 1100.83 B: Do you **know** that?

L*H-H%

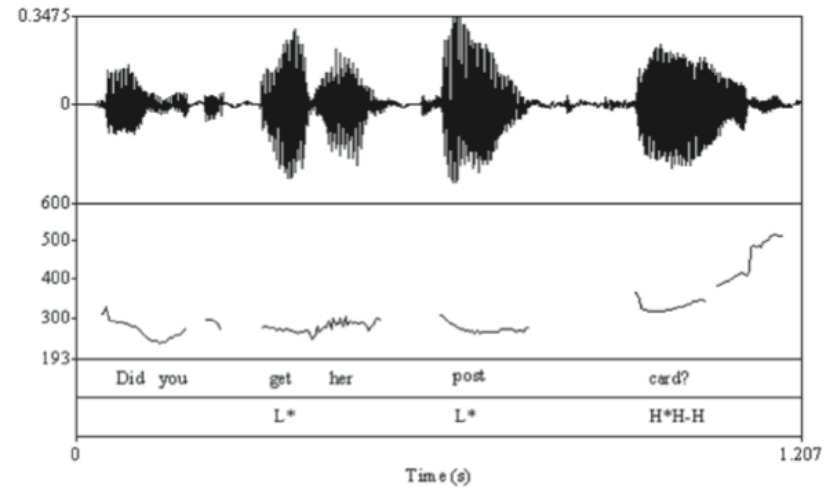
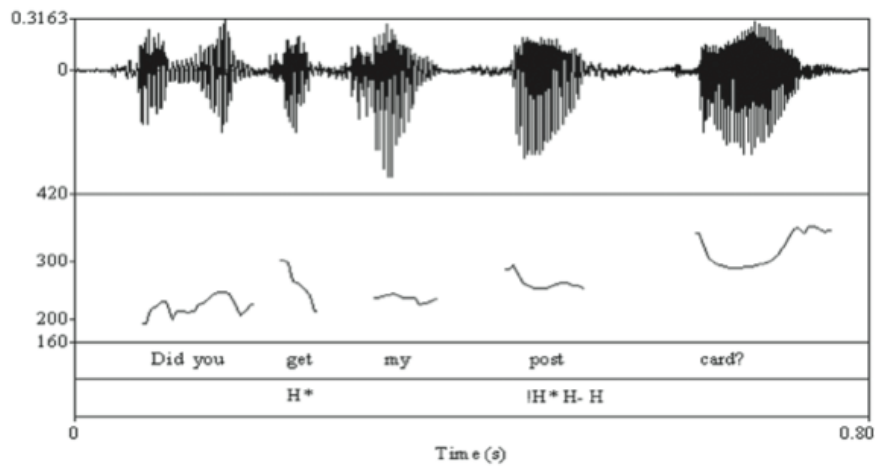
(16) 289.03 290.07 A: Is he working now?

290.63 292.55 B: No, in fact he got laid off. Did you **know that?**

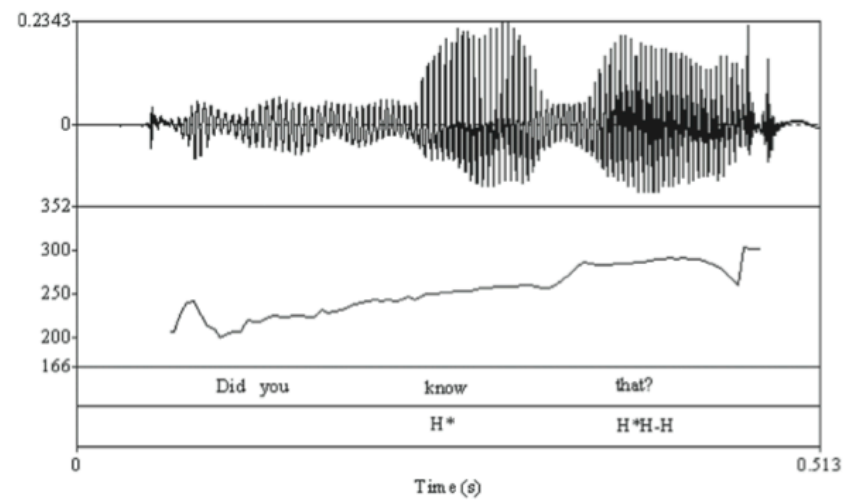
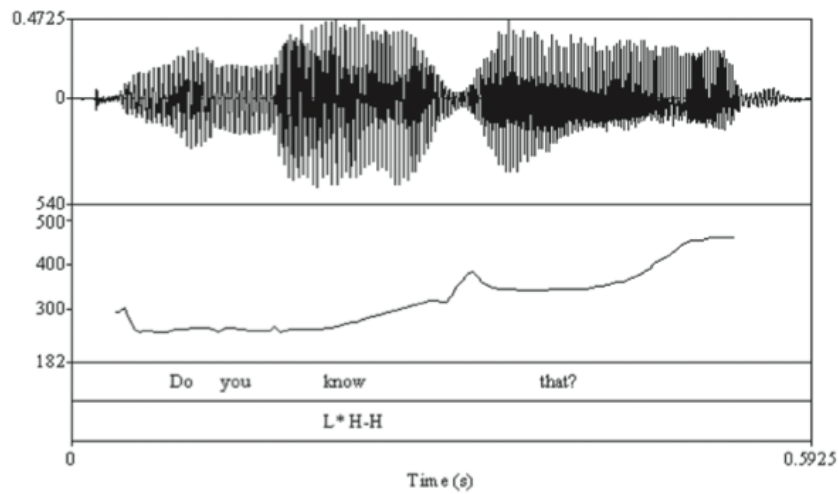
H*

H*H-H%

Pitch tracks



Pitch tracks



6. Pragmatic coding: Wh-questions

- For wh-questions we classified the 200 examples according to the dialogue function of the questions. We devised a system of binary features to classify each question along five dimensions, as summarized in the next slide.

6. Pragmatic coding: Wh-questions

- a. Does the question seek information?
- b. Does the question result in the floor being passed to the other participant?
- c. Does the question serve to change the topic of conversation?
- d. Does the question interrupt the flow of the current speaker's turn?
- e. Is the propositional content of the question already in the conversational record?

6. Pragmatic coding: Wh questions

- According to these dimensions, nine pragmatic subcategories of questions could be established:
 - a. **Elaborative detail:** The question asks for elaboration on the current topic of conversation without changing the topic and without taking over the floor.
 - b. **Floor Deferring:** The question is used to pass the floor to the other participant.
 - c. **Directing Information Flow:** The question is used to change the topic of conversation without passing the floor to the questioner.
 - d. **Rhetorical:** The question is not information seeking.
 - e. **Supplementary Information:** The questioner interrupts the current speaker in order to ask for background information necessary for understanding the current topic.
 - f. **Topic Initiator:** The question sets a new topic of conversation.
 - g. **Reciprocal Question:** A subset of Floor Deferring questions, whereby the questioner asks the same question he was just asked back to the other participant.
 - h. **Clarification Question:** The question asks for repetition of information that is already in the conversational record.
 - i. **Return to Old Topic:** The question changes the topic of conversation by returning to an earlier topic from which the conversation had diverged.²³

6. Pragmatic coding: Wh-questions

Pragmatic Category	High Fall	Rise-Fall	Low fall	Rise	Fall-Rise	Level	TOTAL
Elaborative Detail	37	12	4	3	2		58
Floor Deferring	15	8		2			26
Directing Information Flow	14	11			1		26
Rhetorical	10	8	3	5			26
Supplementary Information	1		1	13			15
Topic Initiator	5	4	2	2	1		14
Reciprocal Question	9	2	1		1		13
Clarification	3	2		6		1	12
Return to Old Topic	2	2	2				6
Unclassified	2	1	1				4
TOTAL	98	50	14	31	5	2	200

7. Rising wh-questions

- Non-canonical, rising intonation is typically used for Supplementary Information questions (13/15) and often used for Clarification questions (6/12). These two categories account for 19/31 or 61.3% of rising wh-questions. The next most frequent category of rising questions is Rhetorical questions, adding 5 more to the rising question category.
- The Interruptive dimension best predicts which questions are going to rise. Supplementary Information questions are always interruptive, Clarification questions typically are, and Rhetorical questions may be interruptive.

7. Rising wh-questions

Supplementary Information questions:

(17) [A has been worrying about where she could stay when she visits]

A: But if not I mean I'm just coming anyway but I have no idea like where I'll go-

B: **When** are you **planning** on **coming**?

L*+H

!H*

L*H-H%



(18) A:And the director's in Detroit.

B: Yeah, we're all in Detroit but the area directors um travel to the cities that the volunteers are in, and um you know meet with the communities and stuff like that. So-

A: **What's** your **area** then?

H*

L*H-H%



7. Rising wh-questions

Clarification questions:

(19)[A is citing an email address while B writes it down]

A: ... dot H I T C.

B: **What's** after the **dot**?
L*+H L*H-H%



(20) A: **Which** did you say you **preferred**?
H* L*H-H%



Rhetorical question:

(21) [Following a pause in the conversation, A recollects her thoughts]

A: **What** was I gonna **say**?
L*+H H*H-H%



7. Rising wh-questions

- Except for the Rhetorical questions, these rising wh-questions are genuine questions.
- Pragmatically, perhaps the rise serves to politely indicate that the questioner is not seeking to take the floor and that the interruption is necessary in order for the conversation to proceed.

8. Inquisitive semantics analysis: Rising wh-questions

- In listening to rising wh-questions occurring in everyday life, Hedberg & Mameni 2010 proposed a possible semantic function of rising wh-questions.
- I will now explain this semantic function and then extend it to the non-canonical, falling yes-no questions.

8. Inquisitive semantics analysis: Rising wh-questions

- Hamblin 1973 analyzed the semantic denotation of a question as the set of its possible answers, i.e. a set of propositions, each of which is an answer to the question. A proposition is viewed as a set of possible worlds.
- For a yes-no question, this means partitioning the set of possible worlds into two sets: those in which the proposition is true and those in which it is false.
- For a wh-question such as “Who called?”, with Peter, Bill and Mary as alternative answers, the question meaning again consists of a set of sets of worlds, those in which Peter called, those in which Bill called, and those in which Mary called.

8. Inquisitive semantics analysis: Rising wh-questions

- Hedberg & Mamani 2010 suggested that the general meaning of rising intonation on wh-questions is to convey that the set of possible answers actually under consideration is relatively small.
- A rising question is possible in (22b), which conveys that the questioner used to know but has forgotten.
 - (22) A: Did you hear? We have a new department secretary.
B: a. Yes, I heard. What's her **name**? ↓
b. Yes, I heard. What's her **name**? ↑
- The rise is not possible in (23b) where the questioner is just learning about the new secretary. The final rise seems to indicate that the questioner already has partial information.
 - (23) A: Did you hear? We have a new department secretary.
B: a. No, I didn't hear. What's her **name**? ↓
b. # No, I didn't hear. What's her **name**? ↑

8. Inquisitive semantics analysis: Rising wh-questions

- Even in the case of clarification questions, the questioner has some idea of what the addressee had said—thus the set of possible answers again is not wide open.

(24)[A is citing an email address while B writes it down]

A: ... dot H I T C

B: **What's** after the **dot**?

L^*+H

$L^*H-H\%$

- In (25), B is not sure what A had said but is sure that it wasn't "London."

(25)A: I visited Tokyo.

B: **Where** did you **visit**? ↑

A: London.

B: That's not what you said!

8. Inquisitive semantics analysis: Rising wh-questions

- In (26), an attested example I heard in everyday life, the speaker confirmed afterwards that he intended to convey that he was familiar with the psychology faculty at York. Again, the questioner has partial information as to the answer.

(26) **Who** did you **work** with at **York**?
L+H* !H* L*H-H%

- This is not a Supplementary Information question because it does not interrupt the other speaker. It is an Elaborative Detail question, but is still pronounced with rising intonation due to the implication of partial information.

8. Inquisitive semantics analysis: Rising wh-questions

- As suggested in Hedberg & Mameni 2010, the compositional denotation of the terminal wh-question rise can thus be viewed as shown in (27a), which conveys the information shown in (27b) when applied to the question in (22b):

(27) a. $\llbracket \uparrow \rrbracket = \lambda Q_{\langle \langle st \rangle t \rangle}. \lambda R_{\langle \langle st \rangle t \rangle}. R \subseteq Q$

b. $\llbracket \text{What's her name? } \uparrow \rrbracket \subseteq \llbracket \text{What's her name? } \downarrow \rrbracket$

- That is, the rising intonation pattern can be seen as signaling that the denotation of the question expressed semantically by the sentence should be mapped to a question with a more restricted domain of possible answers, and that it is this more restricted question that is actually being asked.

8. Inquisitive semantics analysis: Rising wh-questions

- Inquisitive Semantics (Groenendijk & Roelofsen 2009) is a theory of semantics that deals with how different types of sentences, including especially questions, update the common ground.
- A proposition constitutes a proposal to update the common ground in one or more ways.
- An utterance is “inquisitive” if the proposition it expresses allows for more than one way to update the common ground, and an appropriate response will establish one of the proposed updates.
- An utterance is “informative” if it narrows down the set of possibilities.

8. Inquisitive semantics analysis: Rising wh-questions

- We suggested that a wh-question with non-canonical, rising intonation conveys that the update to the common ground being proposed is relatively non-inquisitive compared to what it would have been like if pronounced with canonical intonation.
- In Hedberg & Sosa 2011, we suggested that this account can be extended to yes-no questions with non-canonical, falling intonation.

8. Inquisitive semantics analysis: Falling yes-no questions

- The fall in (28) conveys that the utterance is informative, so that the instruction is simply to add “I have a new job” to the common ground:

(28) Did I **tell** you that I have a new **job**?
L+H* !H* !H* L*L-L%

- Similarly, (29) is used as a request for action rather than a question. It conveys a single way of updating the common ground, by adding “we will talk about the job things now” to the hearer’s “plans set” (Han 2000).

(29) Can we **talk** about the **job** things now?
H* L*L-L%

8. Inquisitive semantics analysis: Falling yes-no questions

- Discourse markers like (30) make a comment about the previous conversational contribution and do not establish a choice between two alternative propositions.

(30) Is **that** right?

L*L-L%

- Finally, (31) simply conveys that the speaker is aware that the addressee has a cold and this proposition is placed in the common ground.

(31) Do you have a **cold**?

H*L-L%

8. Inquisitive semantics analysis: Conclusion

- We proposed that non-canonical, falling intonation on yes-no questions signals that the question is relatively non-inquisitive in that it is not seeking a choice between the positive and negative possibilities conveyed by its form. Instead the question is being used e.g. to make an assertion or to issue a request for action.
- Non-canonical wh-questions are rising, and convey that the question is relatively non-inquisitive, in that a relatively small set of answers is under consideration.

9. Compositional account: Truckenbrodt 2012

- H- presupposes that the speaker is putting a salient proposition up for question.
 - With a canonical L*H-H% yes-no question, the speaker puts the expressed proposition up for question.
- H* presupposes that the speaker is adding a salient proposition to the common ground.
 - In a canonical H*L-L% wh-question, the absence of H- corresponds to the absence of an obvious proposition put up for question.
 - H* looks for a speaker-asserted salient proposition and finds the existential implicature of the wh-question.

9. Compositional account: Truckenbrodt 2012

- Non-canonical H*L-L% yes-no questions.
 - Use 1: The speaker adds the expressed proposition to the common ground.
 - Does John have a **car** now. I didn't know that. (Bartels 1999)
H*L-L%
 - Do you have a **cold**?
H*L-L%
 - Use 2: The speaker endorses the associated salient alternative proposition, keeping the addressee to the point.
 - Do you **know** the defendant? (Bartels 1999)
H*L-L%

9. Compositional account: Truckenbrodt 2012

- Non-canonical L*L-L% yes-no questions.
 - Did I **tell** you that I have a new **job**?
L+H* !H* !H* L*L-L%
 - Can we **talk** about the **job** things now?
H* L*L-L%
 - Is **that** right?
L*L-L%
- “The current account is compatible with assigning L* a meaning that is the negation of H* [as in Pierrehumbert and Hirschberg 1990] and with assigning L- a meaning of speaker endorsement [as in Bartels 1999], but there is no clear evidence for either of these moves.”

9. Compositional account: Truckenbrodt 2012

- Non-canonical H*H-H% yes-no questions.
 - It's not clear whether there are any left in the corpus data.
 - Pierrehumbert & Hirschberg 1990 say that H*H-H% is more likely when the expected answer is 'yes'.
 - A: [Showing B how to make a blouse.] This is the left sleeve; and here is the right one.
 - B: Is there any **difference** between them? (Bartels 1999)
H*H-H%
 - “The *content* of the implicature is that there is a difference between them, but the *fact* of the implicature would be ‘I suppose there is a difference between them.’ Since endorsing the content of the implicature by H* would lead to an interpretation that conflicts with the questioning intention, it is reasonable that H* instead operates on the proposition that corresponds to the *fact* of the implicature....This would correctly represent the weak effect of H* in yes-no questions.”

9. Compositional account: Truckenbrodt 2012

- Non-canonical L*H-H% wh-questions.
 - **When** are you **planning** on **coming**?
L*+H !H* L*H-H%
 - **Which** did you say you **preferred**?
H* L*H-H%
- The friendly rise in wh-questions.
 - A: I was on holiday last month.
B: Where did you **go**? (Schubiger 1958)
 L*H-H%
 - “Following Hintikka 1975 the interpretation of ‘where did you go?’ would be ‘Bring it about that I know where you went.’ Putting a propositional form of this up for question results in ‘Will you bring it about that I know where you went?’ This would seem to add friendliness. It would show that it is up to the addressee to answer.”

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