Lost in Transmission*

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Abstract

For many economic decisions, people rely on secondhand information received from others by word of mouth. Does the process of oral transmission systematically distort economic information? In our experiment, participants listen to audio recordings containing forecasts of economic quantities and are paid to accurately relay the information via voice messages. Other participants listen either to the original recordings or transmitted versions of them and then state incentivized beliefs about the economic quantities. We show that information about the reliability of a forecast is much more strongly lost in transmission compared to the content of the forecast itself, and that this predictably distorts the posteriors of recipients of transmitted messages. Transmission-induced loss of reliability information dramatically increases the influence of unreliable forecasts relative to reliable forecasts on beliefs. We investigate potential mechanisms behind this differential information loss and provide evidence that difficulty articulating information about reliability plays an important role.

Keywords: Information Transmission, Level Information, Reliability, Speech, Beliefs, Narratives.

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1 Introduction

For many economic decisions, people rely heavily on secondhand information obtained from conversations with family, friends, colleagues, acquaintances, and strangers (e.g., Lazarsfeld et al., 1968; Conley and Udry, 2010; Bandiera and Rasul, 2006; Granovetter, 1973; Banerjee et al., 2013; Conlon et al., 2022; Breza, 2016; Chandrasekhar et al., 2022). The quality of individual decisions therefore critically hinges on the ability of word-of-mouth transmission to accurately preserve information.

A priori, we can expect oral information transmission to result in substantial information loss. As the classic game of *Telephone* illustrates, the meaning of even the simplest sentences can get garbled beyond recognition in the process of word-of-mouth transmission. Passing on economically relevant information accurately is cognitively demanding: it requires people to reconstruct the original content in their head and then pass it on faithfully and comprehensibly while facing potentially binding memory and articulation constraints.

How transmission loss shapes the supply of information and downstream belief formation depends both on the general degree of loss and on whether some types of content are systematically more likely to be compromised than other types, creating predictable distortions in behavior. Of course, distinguishing between different kinds of information is difficult. Information is high-dimensional: people tell and retell stories, anecdotes, opinions, and facts containing many kinds of information (Shiller, 2020). Characterizing the nature of transmission loss requires a framework that organizes the different types of information that are transmitted.

Building on Griffin and Tversky (1992), we rely on a taxonomy that distinguishes between communicating a forecast about the *level* or direction of change of a variable and the *reliability* or credence of the forecast. We hypothesize that people pass on signals about the level or change of a variable more accurately than information about the reliability of those signals, for example because information about the level comes to mind more easily or because the cognitive cost of articulating information about the level is lower than the corresponding cost of communicating reliability. This kind of differential information loss

would have far-reaching implications: if forecasts are accurately preserved by transmission but the reliability of those forecasts is garbled, downstream beliefs will be shaped excessively by low-reliability forecasts and insufficiently by high-reliability ones.

In this paper, we study the nature and consequences of oral information transmission. We examine (i) how oral transmission alters information about the level and reliability of a message, and (ii) the systematic implications of transmission for downstream beliefs. To address these questions, we conduct a series of tightly controlled pre-registered experiments with more than 2,000 U.S. participants.

We begin with a transmitter experiment: participants listen to two short recordings by "originators" who provide qualitative forecasts about the future paths of two economic variables. Then, they record their own verbalizations of the information content of the original recordings. These participants (henceforth "transmitters") are incentivized to pass on the contained information to a "listener" with maximum accuracy. Specifically, transmitters are told their payoff depends on the scores they receive from evaluators who will assess how accurately information about the *level* and *reliability* of the original forecast was passed on in the transmitted message. Each transmitter does this for narratives about two variables: home price growth in a US city and revenue growth of a US retailer.

Within each topic, we randomize two key features of the original message: its forecast about the level of the variable, and the reliability of the forecast. First, we randomize whether the originator argues for an increase or a decrease in the variable. Second, we randomize the reliability of the originator's message. We use two kinds of reliability manipulations. The first varies the originator's expressed confidence in their forecast by weaving in either certainty-denoting ("definitely," "undoubtedly") or uncertainty-denoting ("possibly," "conceivably") prefixes and explicit confidence statements ("I am highly confident" or "I am not at all confident") into an otherwise-identical text. The second manipulation simultaneously varies multiple implicit and explicit signals of reliability, including the originator's confidence, credentials, stated sources of evidence, fluency, and vocabulary. For example, a high-reliability message sounds highly fluent with a sophisticated vocabulary, cites respectable sources of

evidence, and mentions relevant credentials. A low-reliability message is full of disfluencies, expresses low confidence, cites obviously unreliable sources, and admits a lack of relevant credentials.

In a subsequent listener experiment, a separate sample of respondents ("listeners") listen either to the original recording or a transmitted version of the same recording, for each of the two topics. Respondents express incentivized beliefs about future changes in the variable, as well as incentivized quantitative beliefs about the information contained in the original message (both the originator's prediction about the level of the variable and the reliability of the prediction). Beliefs formed based on listening to the *original* recordings provide us with a measure of the (quantitative) information content of the original (entirely qualitative) recordings. This benchmark allows us to quantify the extent of information loss in the transmitted messages. In particular, we define information loss as the ratio of the belief movement induced by the transmitted messages to the belief movement induced by the corresponding original messages. For example, if a switch from a low-level-forecast to a high-level-forecast original message induces a belief movement of 8 percentage points on average, while the same switch among transmitted versions of those original messages induces a belief movement of just 4 percentage points on average, this would correspond to an information loss of 50%.

We begin by examining listeners' incentivized belief updates about the state of the world. Among listeners hearing the original messages, switching from a message forecasting a high level of the variable to a message forecasting a low level induces a 1.23 s.d. shift in belief updates on average. Among listeners hearing transmitted versions of the same messages, the corresponding shift is 0.87 s.d., indicating $100 \times [(1.23 - 0.87)/1.23] = 29\%$ information loss (s.e. 7) about the levels of forecasts.

Meanwhile, we observe much stronger information loss about the reliability of messages. Among listeners hearing the original messages, their belief updates based on a given forecast are strongly moderated by the reliability of the forecast: listeners hearing a low-reliability forecast in a certain direction update their beliefs only half as strongly as listeners hearing

a high-reliability forecast in the same direction. By contrast, among listeners hearing transmitted messages, this distinction between low-reliability and high-reliability messages nearly disappears: listeners hearing low- and high-reliability messages in a given direction update by almost the same amount. According to our measure of information loss, 65% (s.e. 23) of reliability information is lost in transmission: listeners hearing transmitted messages are only 35% as sensitive to the reliability of the original messages. Hence, the transmission process dramatically increases the relative influence of low-reliability forecasts on beliefs.

Examining respondents' belief updates about the state of the world is an imperfect way of calculating information loss, since belief updates are simultaneously determined by information about levels and reliability (meaning information loss in one domain potentially spills over into loss in the other), and belief updates are potentially polluted by respondents' own opinions about the narratives in the original messages. To deal with these challenges, we turn to beliefs about the originator's forecast and the reliability of that forecast. Again, we see that reliability information is lost about twice as much as information about the level of the forecast itself. Treatments manipulating the levels of the forecast induce a movement of 1.47 standard deviations in beliefs about the originator's prediction among respondents listening to the original messages, compared to a movement of 0.94 standard deviations among respondents listening to corresponding transmitted messages, corresponding to an information loss of 36.3% (s.e. 5.6) about the level of the forecast. For treatments manipulating the reliability of the message, original messages induce a movement of 1.24 sd in beliefs about the original message's reliability, while these treatments shift beliefs by only 0.38 sd among respondents listening to transmitted versions, corresponding to an information loss of 69.1% (s.e. 7.2) about reliability.

What drives this differential information loss? In general, differential loss could arise either because transmitters deliberately choose to focus on communicating level information (perhaps believing that such information is more decision-relevant), or because transmitters face memory or articulation constraints that are stronger for reliability information.

We rule out the first mechanism by carefully designing the incentives faced by transmitters

in our baseline experiment. Half of respondents are generically incentivized to pass on all of the information in the original messages, while half are explicitly and equally incentivized to pass on both the level and reliability of the original forecast. We observe virtually identical differential information loss in both groups.

This leaves two possible mechanisms: memory constraints (transmitters selectively forget reliability information and hence fail to pass it on) or articulation constraints (transmitters remember the reliability information, but struggle to communicate it effectively).

To distinguish the two, we directly measure memory loss among transmitters by eliciting their beliefs about the information content of the recordings after they have recorded their messages. Transmitters' post-transmission beliefs about both levels and reliability are just as sensitive to variations in the original recordings as the beliefs of listeners directly hearing original recordings, despite experiencing a much larger gap between hearing the original recordings and expressing beliefs. This indicates minimal memory loss among transmitters and accounting for transmitter beliefs in our analysis does not affect our differential loss results.

We hence find no evidence that memory constraints can explain the finding on differential information loss. This suggests that differential information loss is driven by articulation constraints: transmitters struggle to express reliability information. Consistent with this, we compare the transcripts of transmitted messages to the original messages and see a substantial drop in the presence of uncertainty- and certainty-denoting words, as well as a large share of transcripts that completely omit information about the reliability of the original message. Extensive-margin omission of reliability information explains the entirety of differential information loss.

Overall, our findings highlight strong differential loss of reliability information as well as a general weakening of belief updates on the basis of transmitted information (relative to original information). Our findings have two important implications. First, word-of-mouth transmission reduces the impacts of a piece of information on downstream beliefs, meaning people with initially disparate priors may fail to converge to common beliefs when

they receive information that has been weakened by the word-of-mouth filter. Second, our differential loss results imply that in the presence of word-of-mouth transmission, behavior will be insufficiently shaped by high-reliability information, especially compared to low-reliability information. This means that when low-reliability and high-reliability information conflict, low-reliability information can "win out."

Our paper ties into various literatures. First, it relates to a large literature on social learning (Golub and Sadler, 2016; Golub and Jackson, 2010; Dasaratha et al., 2018; DeMarzo et al., 2003) and information diffusion (Fehr et al., 2022; Banerjee et al., 2013, 2019; Chandrasekhar et al., 2022), as well as theoretical and empirical literatures on strategic communication (Cooper et al., 1992; Crawford and Sobel, 1982; Blume et al., 1998; Barron and Fries, 2023; Braghieri, 2023b). Most closely related, Conlon et al. (2022) show in the context of a classic balls and urns paradigm that people are much less sensitive to quantitative information discovered by others, compared to equally-relevant information they discover themselves. We differ from this literature in our focus on (i) the transmission of qualitative information in the form of narratives, and (ii) the investigation of underlying cognitive mechanisms.[1]

Our focus on qualitative stories about economic variables allows us to shed light on how cognitive constraints shape information transmission (Shiller, 2017, 2020). We thereby contribute to a new emerging literature on narratives and belief formation (Andre et al., 2022; Kendall and Charles, 2022; Bursztyn et al., 2023; Graeber et al., 2023b). Our experiments identify which basic features of a message are more likely to be successfully passed on from one person to another. We relate to work by Graeber et al. (2023a), who study how social learning from verbal explanations affects the proliferation of truths versus misbeliefs in the context of financial decisions.

Finally, we also relate to a literature on cognitive constraints and belief formation (Enke and Zimmermann, 2019; Graeber, 2022; Enke, 2020; Bordalo et al., 2021b,a; Ba et al., 2022; Hartzmark et al., 2021) and to an emerging literature on complexity and belief formation

[1]Braghieri (2023a) provides a theoretical framework to study the process of decoding for an agent who might have inaccurate beliefs about the information environment.

(Oprea, 2020; Enke and Graeber, 2023; Enke et al., 2023). Our paper offers a new perspective by analyzing how the transmission of information induces differential information loss for different types of information and thereby shapes downstream beliefs. Our results highlight an important role of articulation constraints in driving information loss.

Our paper proceeds as follows: Section 2 describes the design of our transmitter and listener experiments. Section 3 provides results on differential information loss. Section 4 provides evidence on mechanisms. Section 5 concludes with a summary.

2 Baseline Design

In this section, we describe our baseline design. It consists of two experiments. We start by describing the *transmitter experiment*, where respondents listen to a recording and are incentivized to pass on the information contained in the recording. We then describe the *listener experiment*, where another set of respondents listen to either the original recordings or transmitted versions of them before forming their beliefs.

Our baseline study design is guided by the following objectives: (i) an experimental setting in which one can quantify the transmission rates of different kinds of information, (ii) well-defined incentives for transmission, (iii) systematic variation in different types of information in the original recordings and (iv) an incentive-compatible belief elicitation in the listener experiment to quantify information loss due to transmission.

2.1 Logistics

Sample We conducted our transmission and listener experiments on Prolific, a widely used online platform to conduct social science experiments (Eyal et al., 2021). The transmission experiments and listener experiments were run with 501 and 1,509 US respondents, respectively, in September 2023. In order to participate in our transmission experiments, respondents needed to have a working microphone enabling them to record their voice. Our data collections were pre-registered on the AEA RCT registry: `https:`

//www.socialscienceregistry.org/trials/12119.

Voice Recordings Our transmitter experiments yield a total of 941 valid speech recordings. These are obtained by measuring speech recordings with *Phonic* which we embed into *Qualtrics*.[2] Our transcription of recordings allows for a rich analysis of the content distortions caused by the process of oral transmission.

2.2 Transmission Experiment

Structure of Experiment In the transmission experiment, respondents listen to one recording containing two opinions about the following economic variables, in a random order: home price growth in an anonymous US city and revenue growth of an anonymous US retail company. The opinions were written and recorded by us; respondents are told that these opinions are based on real opinions about these topics, and are told at the end of the survey that other participants heard recordings arguing for the opposite conclusions. The recording containing both opinions lasts for 2-3 minutes, with each opinion lasting 1-1.5 minutes. Then, respondents are asked to record their own verbalization of the first opinion they listened to, answer some beliefs questions about that topic, and then record their verbalization of the second opinion and answer further beliefs questions.

Speech Recordings Our experiments rely on speech recordings of people's economic forecasts.[3] Speech recordings have a series of advantages compared to written text. First, oral information transmission is of intrinsic interest because it is the dominant form of communication in daily life, and an important source of information for many people through conversations with friends, family, and colleagues as well as consumption of spoken content from TV, radio, or podcasts. Second, unlike written communication, the spontaneity of oral communication provides a natural testing ground for analyzing how cognitive constraints

[2]We rely on an Amazon Web Services (AWS) backend to manage and feed in the recordings into the Listener experiment.

[3]We implement the recording of speech data through Phonic (`https://www.phonic.ai`), which we embed in our Qualtrics survey.

affect information transmission. Third, speech data allows us to capture critical features of natural language, including tone, emphasis, and disfluencies.

Transmitter Incentives Respondents receive incentives to transmit all information contained in the original messages. Respondents are informed that one in 10 transmitters will be selected for bonus eligibility and that, if selected, a different group of participants will score their recordings on a scale of 0 to 10, where 0 corresponds to "Nothing conveyed in meaning" and 10 corresponds to "Everything conveyed in meaning". If the average score their recordings receive is at least an 8, they will receive a $20 bonus payment. Between subjects, we randomly assign respondents to two variants of the incentive scheme: In the "implicit incentive treatment" participants are given the following instructions:

> The other participants will answer the following question about your voice message: How accurately did the voice message convey the content and meaning of what the speaker said?

In the "explicit incentive treatment", respondents are explicitly told that the other participants will answer two questions, one about the point forecast implied by the message and one about the reliability of the message. In particular, they receive the following instruction:

> The other participants will answer two questions about your voice message.
> How accurately was the level of the speaker's prediction conveyed in the voice message?
> How accurately was the reliability of the prediction conveyed in the voice message?

Original Recording Conditions Within each of the two topics, we randomize three key features of the original recordings: First, we randomize whether the piece argues for an increase or a decrease in the level of the variable (*Level treatment*: increase or decrease). Second, we randomize the reliability of the original recording (*Reliability treatment*: weak

reliability, strong reliability, or neutral reliability). We focus on comparisons of weak reliability and strong reliability in the paper, as neutral reliability recordings induce belief updates very similar to those induced by strong reliability recordings.

We randomly assign respondents between two kinds of reliability manipulations. Respondents in the *naturalistic condition* hear recordings that vary reliability using a combination of explicit statements about confidence, evidence quality, and speaker competence, as well as implicit markers of reliability such as verbal fluency and vocabulary. The naturalistic condition contains just weak and strong reliability messages (no neutral messages). Meanwhile, respondents in the *modular condition* receive recordings that are identical except for a set of explicit markers indicating either high or low reliability (e.g., "definitely" vs. "possibly", "will" vs. "might", etc.) and explicit confidence statements ("I am highly confident" vs. "I am not at all confident"). Respondents in this condition are assigned to one of the following 3 conditions: (i) Strong reliability; (ii) Weak reliability; and (iii) Neutral reliability (where the markers and confidence statements are simply omitted).

Finally, we randomize whether the recording has a male or female voice. This is not a focus of analysis and we randomize simply for symmetry. Randomization is stratified: each transmitter hears two recordings, one with an "increase" and one with a "decrease," one with "strong reliability" and one with "weak reliability," and one with a male voice and one with a female voice.[4]

2.3 Listener Experiment

Structure and Treatments In this design, we aim to quantify information loss resulting from transmission by comparing the belief movements of listeners who listen to our original recordings to the belief movements of listeners who hear corresponding transmitted recordings. For each of the two topics, respondents first state their prior belief about the outcome variable of interest and then listen to a recording about the variable before answering a

[4]Then, if exactly one of the two topics is in the modular condition, that topic has a 33% chance of getting switched to "neutral reliability". If both topics are in the modular condition, there is a 66% chance that one of the two topics is randomly switched to "neutral reliability"

set of beliefs questions. As before, the order of the topics is randomized. For each topic, respondents are randomly matched to a transmitter and listen either to the same original recording as the transmitter heard, or that transmitter's transmitted message. There is a 30% chance of hearing the original and 70% chance of hearing the transmitted recording.

Beliefs After listening to a recording, respondents are incentivized to forecast the future development of the variable as well as to guess the prediction of the message originator and the reliability of the original message. Our experiments involve belief formation about two unknown states: (i) the change in home price growth in a US city and (ii) the change in revenue growth of a US retailer, both for the upcoming year. Each state has three key outcome variables associated with it: the respondent's belief movement (posterior minus prior) about the unknown state; the respondent's belief about the message originator's prediction about the state of the world; and the respondent's belief about the reliability of the originator's prediction.

To measure respondents' beliefs about the state of the world we ask them about the change of the variables of interest in the next 12 months. For home price growth we ask them the following question:

> How will house price growth in this city change over the next 12 months?

To measure respondents' beliefs about the originator's point forecast in the context of home prices, we ask them the following question:

> How do you think the person whose opinion was summarized in the recording predicts house price growth in this city will change over the next 12 months?

To measure the perceived reliability of the original message in the context of house price growth, we ask respondents the following question:

> How reliable do you think the prediction given by the person whose opinion was summarized in the recording is? [...] Concretely, assuming that the true change in house price growth is a number called X, what do you think is the likelihood

that this person's prediction will fall within 1% of X, i.e. between X-1% and X+1%?

Our two unknown states are changes in growth rates because this permits a natural prior of zero and reasonably symmetric possibilities around that prior. This lets us shift beliefs symmetrically up or down with our high- or low-level messages, creating clean variation in the information content of the recordings.

Incentives Respondents are told that one in 10 respondents will be randomly chosen to be eligible for a bonus payment and have one of the incentivized tasks be paid out. Beliefs about the state of the world are always directly incentivized based on the true development of the variable over the next year.[5] Beliefs about the message originator's prediction and reliability are not incentivized for 50% of respondents and posed as a first-order belief for these respondents. For the other half of respondents, the question is phrased as a second-order question ("your job is to predict what people would on average respond to the direct question") and responses are incentivized based on the accuracy of their guess about other participants' average guess.[6]

3 Characterizing Information Loss

3.1 Research Design

Quantifying Information Loss Beliefs formed based on listening to the original recordings provide us with a benchmark for the perceived information content of the original recordings, akin to the approach in Graeber et al. (2023b). This benchmark allows us to quantify the extent of information loss. In particular, we define information loss as the belief

[5]Beliefs about the true state of the world are incentivized with the following formula: Probability of winning \$20 [in %] = 100 10*(Estimate [in %] - True state of the world in 12 months [in %])^2.

[6]Responses are incentivized with the following formula for beliefs about the originator's prediction and reliability, respectively: Probability of winning \$20 [in %] = 100 10*(Response [in %] - Average response to direct question [in %])^2.

movement induced by transmitted messages divided by the belief movement induced by the original messages. For example, if the treatments manipulating the strength of the message induce a belief movement of 8 percentage points among listeners hearing the original recordings, while listeners hearing the corresponding transmitted recordings shift their belief by 4 percentage points, this would correspond to an information loss of 50%.

Figure 1 illustrates possible distortions that could arise through the transmission process. The y-axis shows listener beliefs and the x-axis two Messages, A and B. Panel (a) of this figure illustrates a situation where the process of transmission results in attenuation of belief differences as a result of information transmission, i.e. beliefs formed based on the transmitted recordings are more similar than beliefs formed based on the originals. This could arise, for example, as a result of the omission of information from the original messages. Panel (b), on the other hand, illustrates a situation of amplification, where beliefs formed based on the transmitted messages are more different than beliefs formed based on the original message. This could result from the omission of nuance. In the "attenuation" case, our measure of information loss would be the ratio of the orange slope to the blue slope.

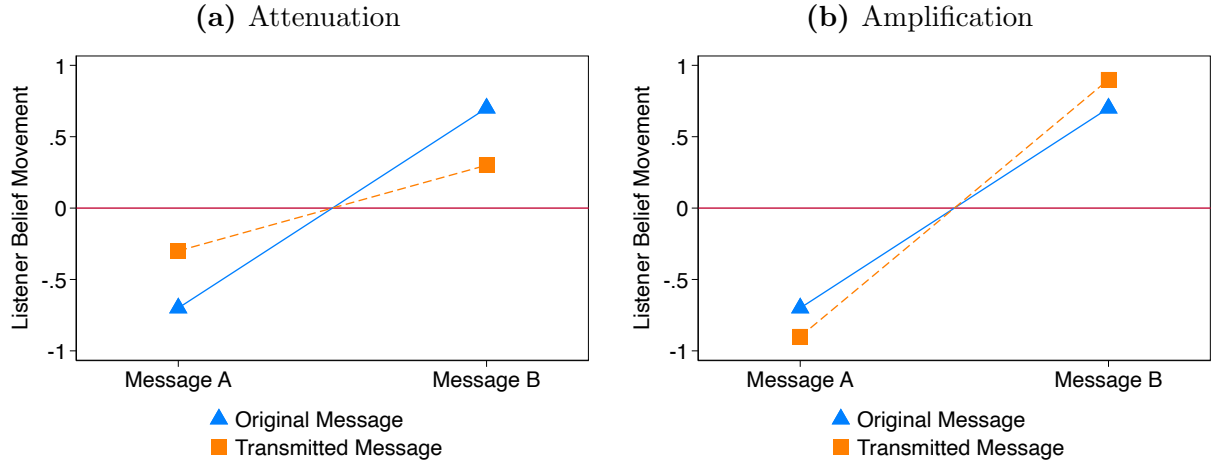


Figure 1: This figure illustrates our research design. Panel (a) depicts a situation where the process of information transmission results in an attenuation of belief differences. Panel (b) shows a scenario where information transmission leads to an amplification of belief differences.

3.2 Results: Differential Information Loss

Beliefs about the State of the World We begin by using data from the listener experiment to examine how the process of transmission affects beliefs about the future development of the variables. Figure 2 illustrates belief movements based on original and transmitted recordings across the different *original recording conditions*.

The blue dots, showing belief updates based on the original recordings, show that people adjust their beliefs in a basically Bayesian way: they update in the direction of the forecast they receive, with the strength of the update moderated by the reliability of the forecast.

The orange dots, showing belief updates based on corresponding transmitted recordings, show two things. On average people, update less from transmitted than from original recordings: the orange dots are on average closer to zero. This is driven by strong-reliability recordings (the first and fourth quadrants), from which people update much less as a result of transmission.

In turn, this means that the distinction between strong-reliability and weak-reliability has shrunk for the transmitted messages compared to the original messages: the first and second dots are much closer to each other for the orange than blue, and similarly for the third and fourth dots. This indicates *loss of reliability information.*

The distinction between the low-level and high-level messages has also shrunk, indicating *loss of level information.* The average of the first and second dots is closer to the average of the third and fourth dots for the orange than the blue. However, as Figure 3 shows, the loss of distinction between weak and strong reliability is about twice as strong compared to the loss of distinction between high and low levels (65% vs 29%).

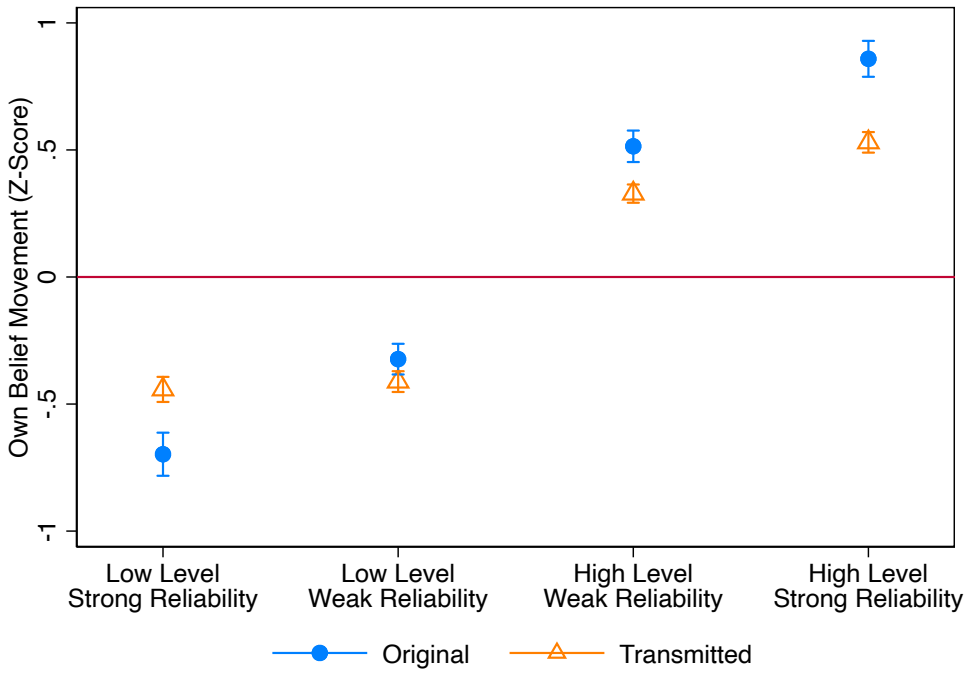


Figure 2: This figure presents belief movement about the true state of the world in response to original and transmitted recordings across the four different main recording conditions. Error bars in this and all subsequent figures represent 1 SE in either direction.

More specifically, Panel (a) of Figure 3 Panel (a) displays average beliefs about the state of the world for the low versus high level conditions, i.e. pooling across the weak and strong reliability treatments. Differences between high and low level original recordings induce a difference of 1.23 s.d., compared to 0.87 s.d. based on transmitted recordings, corresponding to an information loss of 28.7% (SE 7). Meanwhile, Panel (b) displays average beliefs for the weak and strong reliability conditions, i.e. pooling across the low and high level conditions and flipping the sign of the low level beliefs. While differences between high and low reliability recordings are 0.3 s.d. based on original recordings this differences shrinks to 0.1 s.d. based on transmitted recordings. This corresponds to an information loss of 65% (SE 23.4).

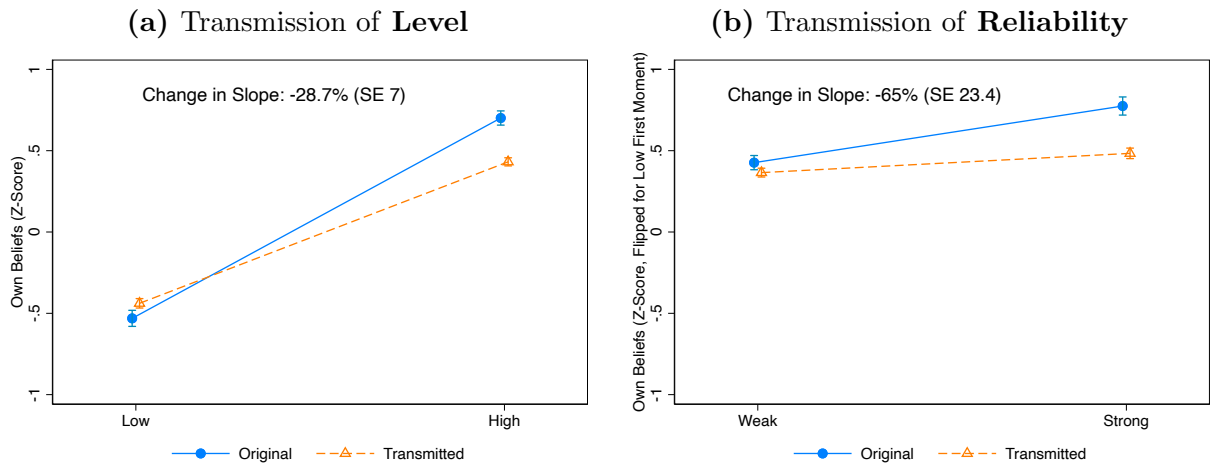


Figure 3: This figure presents belief movement about the true state of the world in response to original and transmitted recordings. Panel (a) shows the transmission of information about the level, pooling across the weak and strong reliability conditions. Panel (b) displays the transmission of reliability information about the level, pooling across the low and high level conditions.

Beliefs about Originators The previous figures do not allow us to cleanly separate loss of level and reliability information because Bayesian belief updates are simultaneously determined by level and reliability, meaning loss in one domain spills into the other. For example, if the average perceived reliability of forecasts decreased due to transmission, listeners would update less on average and the difference in belief updates from low-level versus high-level messages would hence shrink. In other words, distortions in the transmission of reliability information would create the appearance of loss of level information, even if the level information itself was communicated perfectly.

To corroborate our findings with a measure unaffected by these issues but perhaps of less direct economic interest, we additionally quantify information loss based on beliefs about the original message's point forecast and reliability.

Figure 4 illustrates results on the transmission of the level and reliability. Panel (a) examines differences in listener beliefs about the orator's level prediction between low and high level recordings, separately for original and transmitted recordings. This figure highlights that treatments manipulating the levels of the forecast induce a belief movement of 1.47 s.d.

among respondents listening to the original messages, compared to a belief movement of 0.94 s.d. among respondents listening to corresponding transmitted messages, corresponding to an information loss of 36.3% (s.e. 5.6) about the level of the forecast.

Panel (b) examines differences in listener beliefs about the orator's reliability based on weak and strong reliability recordings, separately for original and transmitted recordings. The figure showcases even more pronounced information loss for reliability information: While original messages induce a belief movement of 1.24 sd, these treatments shift beliefs by only 0.38 sd among respondents listening to transmitted versions, corresponding to an information loss of 69.1% (s.e. 7.2) about reliability.

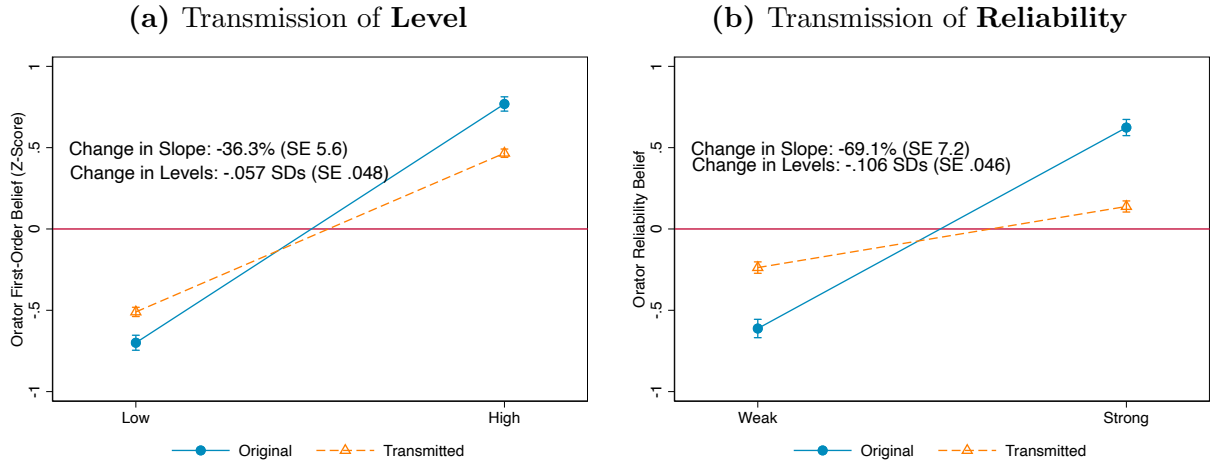


Figure 4: This figure presents beliefs about beliefs about originator's first-order belief and their reliability across the main recording conditions. Panel (a) presents results on beliefs about originator's first-order belief. Panel (b) presents results on beliefs about originator's reliability.

Result 1. *Oral transmission leads to substantial information loss: there is substantial attenuation of belief movement in response to transmitted recordings. This information loss differs for different types of information: Information loss about reliability is almost twice as large as information loss about the level.*

4 Mechanisms

4.1 Incentives for transmission

To study the role of incentives for transmission, we randomized transmitter incentives in our baseline experiment. In particular, next to the baseline incentives used in the main experiment presented in Section 2, we also randomized a separate set of respondents into a treatment that increased the salience of incentives to transmit reliability information. This treatment helps determine whether differential information loss is driven by transmitters believing that reliability information is less important or relevant to transmit: it explicitly tells transmitters that the accuracy of their transmission of reliability information will be weighed identically to their transmission of level information when determining their bonus payment.

In that treatment, respondents are explicitly told that the other participants will answer two questions, one about the point forecast implied by the message and one about the reliability of the message. In particular, they receive the following instruction:

> The other participants will answer two questions about your voice message.
> How accurately was the level of the speaker's prediction conveyed in the voice message?
> How accurately was the reliability of the prediction conveyed in the voice message?

This incentive scheme thus ensures that respondents are explicitly told that the transmission of the reliability of the prediction is equally as payoff-relevant as the transmission of the prediction's level.

Figure 6 showcases that information loss is fairly similar across the implicit and explicit incentives. Information loss for the level is 39.8% for explicit incentives and 32.1% for implicit incentives. Loss of reliability information is at 65.1% for explicit incentives and 73% for implicit incentives. Therefore, perceptions about the relative importance of transmit-

ting level and reliability information are unlikely explain our main results on differential information loss.

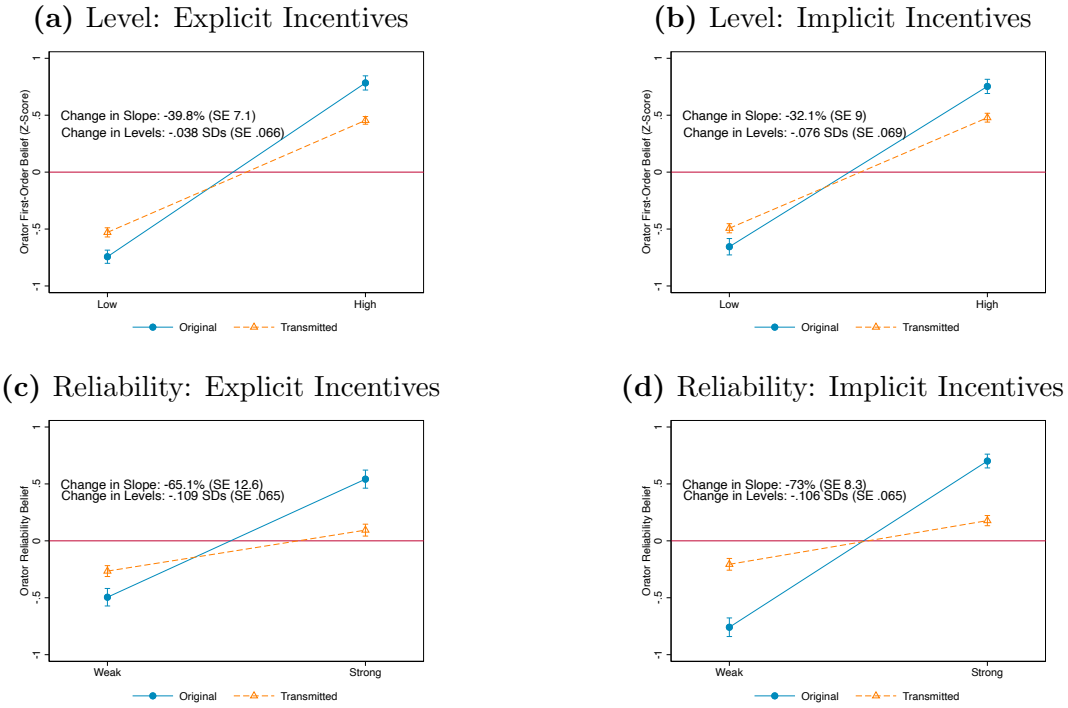


Figure 5: This figure displays information loss for the level and reliability separately by respondents randomized into explicit and implicit incentives.

4.2 Cognitive constraints

In this section, we discuss two different margins of cognitive constraints that might induce information loss: memory constraints and articulation constraints.

4.2.1 Memory Constraints

To test for the role of *memory constraints* among transmitters in driving differential information loss, we analyze transmitter beliefs, which we measure after they complete their recording.[7] Specifically, we present transmitters with the exact set of three beliefs questions

[7]This should provide us with an upper bound for the role of memory constraints as beliefs are elicited after and not during the recording.

we later present to listeners.

Figure 6 illustrates that there is virtually no differential memory loss in transmitter beliefs about the originator's prediction and their reliability: transmitters, whose beliefs are elicited several minutes after hearing the original recording and who performed cognitively demanding tasks in the interval, are just as sensitive to variations in both level and reliability as listeners whose beliefs are elicited immediately after hearing the original recordings. This indicates minimal memory loss for transmitters.

We also calculate the change in slope between original and transmitted recordings, accounting for memory constraints, by comparing the belief slope of listeners hearing transmitted recordings to the belief slope of transmitters (rather than the belief slope of listeners hearing original recordings). Our finding of differential information loss is robust to this, with reliability information loss of 64.3% and level information loss of 35.5%. Taken together, our evidence shows that memory constraints cannot explain differential information loss.

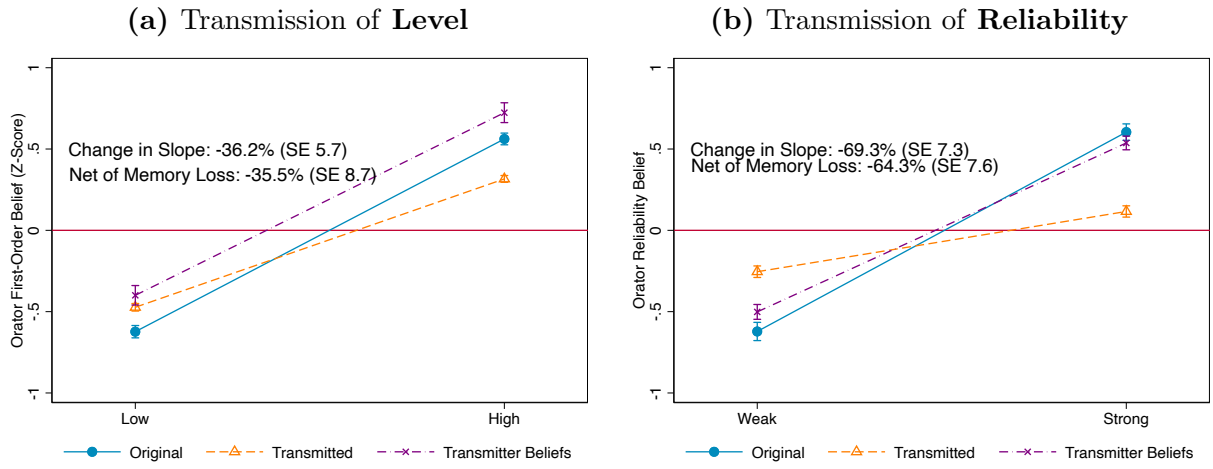


Figure 6: This figure displays information loss for the level and reliability among listeners as well as among transmitters who all receive original recordings. The figure also calculates information loss net of memory loss, meaning the difference between the orange and purple slopes. Beliefs in this case are Z-scored after pooling transmitters' beliefs into the sample.

4.2.2 Articulation Constraints: Loss of Reliability markers

Differences Between Original and Transmitted Scripts To shed light on what drives differential information loss, we characterize how the transcripts of orators' transmissions differ from the transcripts of the original messages.

Panel (a) Figure 7 displays the percent of transmitter transcripts that we classify as containing statements about the level of the original prediction or about the reliability of the original prediction. This figure shows results of human coding and text annotation using large language models. Human coders were instructed to code whether a given script contained information about the level/direction of the original forecast or the reliability of the original message. The figure illustrates that the different coders and the large language model come to similar conclusions.[8]

The key finding of Panel (a) is that while most transmitted scripts contain information about the level (between 88 and 93 percent), a much smaller fraction of transmitted scripts contain information about the reliability of the original message (between 41 and 30 percent). These differences are substantial in magnitude and highly statistically significant ($p < 0.001$). This in turn indicates that extensive margin loss of information may play an important role in driving information loss.

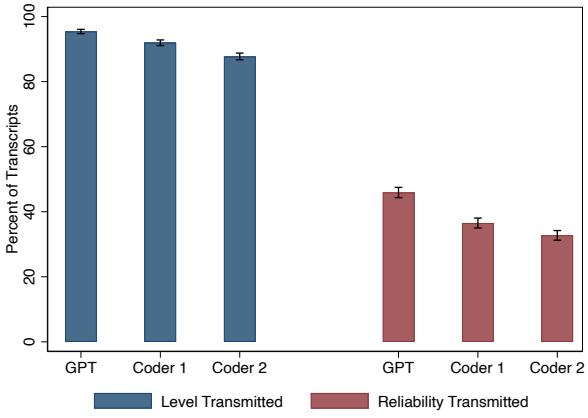
Panel (b) of Figure 7 shows the share of uncertainty words in the original versus the transmitted scripts. It highlights a significant drop in the share of uncertainty words in the transmitted scripts, compared to the original scripts, for the weak reliability treatment. While the share of uncertainty words in original transcripts is close to 6 percent, they are below one percent in transmitted transcripts ($p < 0.01$). There is almost no difference in the share of uncertainty words between transmitted versions of the strong and weak reliability scripts, indicating loss of reliability distinctions.

This loss of uncertainty words in transmitted scripts matters for downstream beliefs. Panel (c) of Figure 7 shows a binscatter of beliefs about forecast reliability on the uncertainty

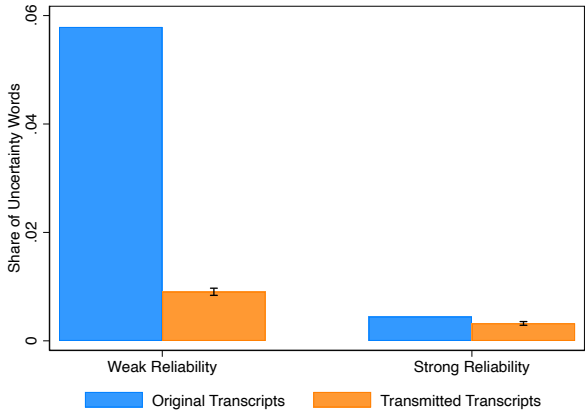
[8]The interrater-reliability of the two human graders for the transmission of reliability is 0.73, and between GPT and each human grader is 0.62-0.64.

word count (residualized on total word count and topic fixed effects), among transmitter scripts only. It shows that the more that uncertainty words survive in the transmitted scripts, the more listeners believe that the original message was unreliable. Residualized counts of certainty words, on the other hand, are not predictive of listeners' beliefs about forecast reliability.

(a) Extensive-Margin Transmission of Level and Reliability



(b) Intensive-Margin Transmission of Uncertainty Words



(c) Uncertainty Words in Transmitted Scripts Affect Listener Beliefs

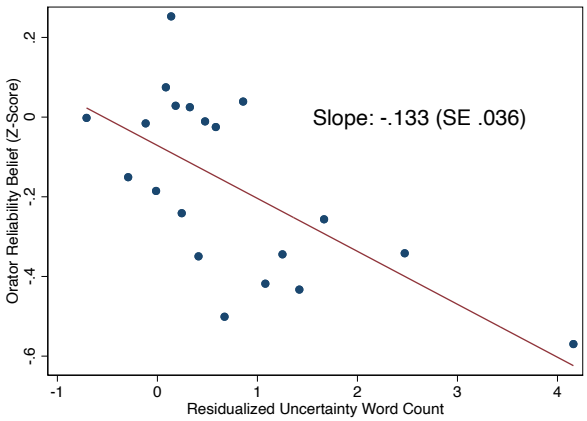


Figure 7: This figure displays results on (i) the loss of reliability markers, (ii) the share of uncertainty words and (iii) the link between uncertainty words and beliefs about originator beliefs. Panel (c) restricts to listeners hearing transmitted recordings.

Decomposition To understand the relative importance of extensive or intensive margin loss of information in the transmitted scripts, we characterize information loss about level and reliability separately for scripts where the respective information was passed on or not.[9]

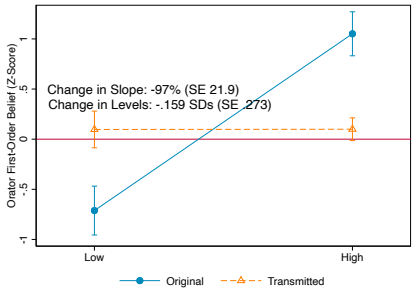
Panels (a) and (c) of Figure 8 show information loss for level information for scripts where level information was not passed on and passed on respectively. The figure shows an information loss of approximately 30% for scripts in which level information was passed on, and close to 100% information loss for scripts in which no level information was passed on.

Panels (b) and (d) of Figure 8 show analogous patterns for reliability information. The figure shows that for scripts where the reliability information is passed on, information loss drop to approximately 30% (the same as the information loss for level information), while it is at close to 100% for respondents exposed to scripts where the reliability information is not passed on.

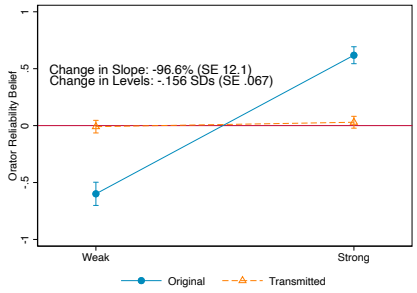
Taken together, these results highlight that virtually all of the differential information loss between level and reliability information is accounted for by differences in whether level and reliability is at all mentioned in the transmitted scripts. This indicates that it is *whether* and not *how* people transmit information about the different types of information that drives differential information loss. This further suggests that other differences in scripts, such as disfluencies or voice features, cannot explain differential information loss.

[9]To minimize measurement error, we restrict to transcripts where GPT and both human coders agree unanimously on whether the relevant information has been passed on.

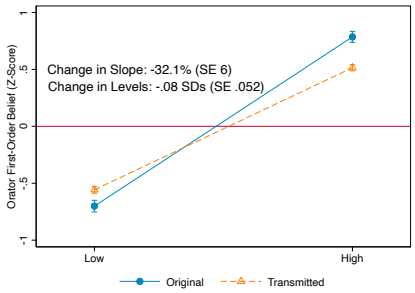
(a) Level Info Loss: Not Passed On



(b) Reliability Info Loss: Not Passed On



(c) Level Info Loss: Passed On



(d) Reliability Info Loss: Passed On

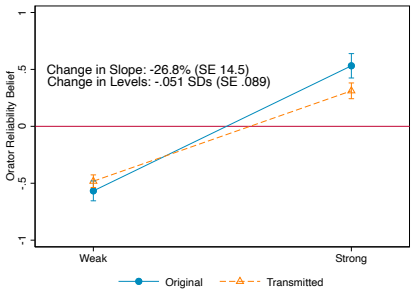


Figure 8: This figure displays information loss for level and reliability by whether the transmitted scripts contain any level and reliability information respectively. We restrict to cases where GPT-4 and both human coders agree unanimously on whether or not the information was passed on.

Result 2. *Our mechanism evidence suggests a limited role of transmitter incentives and thus perceived benefits of transmission. Turning to cognitive constraints, we provide evidence that memory constraints cannot account for differential information loss. Articulation constraints, on the other hand, likely play an important role. This is corroborated by the evidence of content distortions in the scripts, which highlights that virtually all of the differential information loss between level and reliability information is accounted for by differences in whether level and reliability is at all mentioned in the transmitted scripts.*

5 Conclusion

Our economic decisions often rest on information sourced from others through spoken narratives, through which information gets told and retold. Does this process of oral transmission

systematically distort economic information? We conduct experiments to scrutinize this. Participants are tasked with listening to audio clips discussing economic narratives, and conveying the information in the clips as accurately as possible through voice messages. Another group of participants listens to either the original recordings or the transmitted messages, then state their incentivized beliefs. Our research uncovers substantially different information loss for different types of information: the reliability of a message tends to dissipate more in the transmission process compared to information about effect sizes and directions. This appears to be driven by articulation constraints, rather than memory constraints or beliefs about the relative importance of different kinds of information.

Our findings suggest that in the presence of word-of-mouth transmission, individual beliefs and behaviors will be too insensitive to highly reliable messages, especially compared to less reliable information. This in turn implies that if people start with polarized priors, new evidence challenging these priors filtered through word of mouth would only insufficiently shape beliefs and thereby fail to strongly reduce belief polarization. Moreover, it implies that weakly reliable information could beat conflicting strongly reliable information if both were first filtered through speech.

Future research avenues could include further examining the cognitive and social mechanisms behind differential information loss and understanding how this affects economic decisions on a larger scale. It could be beneficial to study whether the same patterns of distortion occur in other types of information transmission, such as written communication or digital media.

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A Additional Exhibits

A.1 Summary Statistics

Appendix Table A1: Summary Statistics: Listener and Transmitter Experiments

	Transmitter Mean	Listener Mean
Age	37	38
Female	.52	.49
Employed	.8	.75
Education: BA+	.59	.56
Race: White	.73	.72
Race: Black	.12	.14
Observations	501	1509

A.2 Regression Tables

Appendix Table A2: Belief Updates About State of the World

	(1) Pooled	(2) Modular Only	(3) Naturalistic Only	(4) Explicit Incentives	(5) Implicit Incentives
Low Level × Strong Reliability	-0.515***	-0.393***	-0.634***	-0.512***	-0.518***
	(0.044)	(0.062)	(0.059)	(0.068)	(0.057)
Low Level × Weak Reliability	-0.385***	-0.424***	-0.362***	-0.404***	-0.364***
	(0.035)	(0.051)	(0.045)	(0.046)	(0.052)
High Level × Weak Reliability	0.381***	0.368***	0.390***	0.371***	0.392***
	(0.033)	(0.055)	(0.041)	(0.046)	(0.048)
High Level × Strong Reliability	0.626***	0.644***	0.615***	0.623***	0.630***
	(0.038)	(0.068)	(0.043)	(0.053)	(0.054)
Nb. obs	2,500	1,288	1,212	1,245	1,255

Standard errors in parentheses

* p¡0.1, ** p¡0.05, *** p¡0.01

Note: This table shows regressions of respondents' belief updates (posterior minus prior, z-scored at the topic × reliability randomization type level) on dummy variables representing the four quadrants of our 2 × 2 level-reliability randomization, with no constant. Standard errors are clustered at the listener by transmitter level. Column (1) does this for our full pooled sample, Column (2) for our subsample hearing the "modular" reliability manipulation, Column (3) for the "naturalistic" reliability manipulation, Column (4) for the explicit-incentives group (where incentives to transmit level and reliability are explicitly separated), and Column (5) for the implicit-incentives group (where transmitters are generically incentivized to pass on all information).

Appendix Table A3: Beliefs About Level of Original Message's Prediction

	(1) Pooled	(2) Modular Only	(3) Naturalistic Only	(4) Explicit Incentives	(5) Implicit Incentives
High Level	1.468***	1.325***	1.628***	1.527***	1.408***
	(0.065)	(0.091)	(0.089)	(0.086)	(0.097)
High Level × Transmitted	-0.492***	-0.406***	-0.588***	-0.543***	-0.437***
	(0.073)	(0.108)	(0.104)	(0.096)	(0.114)
Transmitted	0.190***	0.109	0.279***	0.214***	0.162*
	(0.054)	(0.077)	(0.079)	(0.070)	(0.085)
Constant	-0.700***	-0.578***	-0.838***	-0.743***	-0.655***
	(0.047)	(0.065)	(0.065)	(0.059)	(0.074)
Nb. obs	2,500	1,288	1,212	1,245	1,255

Standard errors in parentheses

* p¡0.1, ** p¡0.05, *** p¡0.01

Note: This table shows regressions of respondents' beliefs about the level of the prediction in the original message on a dummy for the original message being in the high-level condition, a dummy for the respondent hearing a transmitted version of the message, and the interaction of those dummies. Standard errors are clustered at the listener by transmitter level. Column (1) does this for our full pooled sample, Column (2) for our subsample hearing the "modular" reliability manipulation, Column (3) for the "naturalistic" reliability manipulation, Column (4) for the explicit-incentives group (where incentives to transmit level and reliability are explicitly separated), and Column (5) for the implicit-incentives group (where transmitters are generically incentivized to pass on all information).

Appendix Table A4: Beliefs About Reliability of Original Message's Prediction

	(1) Pooled	(2) Modular Only	(3) Naturalistic Only	(4) Explicit Incentives	(5) Implicit Incentives
Strong Reliability	1.236***	0.751***	1.567***	1.037***	1.460***
	(0.077)	(0.120)	(0.096)	(0.112)	(0.105)
Strong Reliability × Transmitted	-0.860***	-0.433***	-1.130***	-0.677***	-1.076***
	(0.098)	(0.156)	(0.119)	(0.138)	(0.131)
Transmitted	0.375***	-0.032	0.628***	0.230**	0.553***
	(0.073)	(0.118)	(0.088)	(0.092)	(0.105)
Constant	-0.612***	-0.304***	-0.802***	-0.495***	-0.759***
	(0.058)	(0.093)	(0.072)	(0.079)	(0.084)
Nb. obs	2,082	870	1,212	1,052	1,030

Standard errors in parentheses

* p¡0.1, ** p¡0.05, *** p¡0.01

Note: This table shows regressions of respondents' beliefs about the reliability of the prediction in the original message on a dummy for the original message being in the strong-reliability condition, a dummy for the respondent hearing a transmitted version of the message, and the interaction of those dummies. Standard errors are clustered at the listener by transmitter level. Column (1) does this for our full pooled sample, Column (2) for our subsample hearing the "modular" reliability manipulation, Column (3) for the "naturalistic" reliability manipulation, Column (4) for the explicit-incentives group (where incentives to transmit level and reliability are explicitly separated), and Column (5) for the implicit-incentives group (where transmitters are generically incentivized to pass on all information).

B Scripts for original recordings: Transmission Experiment

Revenue growth of a retail company

Modular

Introduction

This prediction is about the annual revenue growth of a large US retail company, and specifically whether it will be higher or lower than it was last year.

Increase

This company provides products and services at prices that are [according to some metrics /clearly] more affordable than those of its competitors. The current economic environment is, and [possibly / without a doubt] will continue to be, one of high interest rates. High interest rates [sometimes / inevitably] translate to higher borrowing costs. For consumers with variable-rate debts, their monthly payments [potentially / undoubtedly] increase as a consequence. This means that a larger portion of their income goes [could go / will go] towards servicing these debts, [conceivably / definitely] leaving them with less disposable income for other expenditures.

As discretionary income decreases, consumers [may sometimes / always] become more price-sensitive. As a result, they [might / inevitably] start to prioritize essential purchases and seek out value deals to stretch their diminished budgets. In this scenario, low-cost retailers, who offer products at competitive prices, [could potentially / unquestionably] stand to benefit as they [partially / fully] align with shifting consumer spending behavior. Taking this into account, this company's company's revenue growth will [could possibly / will without the slightest doubt] strongly increase over the forthcoming year. I am highly

confident [I am not at all confident] about my prediction.

Decrease

Economic forecasts [tentatively suggest / suggest with near certainty] that we are [may be/inevitably] due for a downturn in consumer spending. Persistent inflation, which will [potentially/certainly] remain elevated for the foreseeable future, has eaten into consumers' savings. Inflation both raises prices and reduces the real value of existing savings. Meanwhile, higher interest rates have [appear to have/have clearly] raised general borrowing costs, which [may be/are definitely] further constraining consumers' purchasing power. Overall, the economic outlook for consumers is [unclear but broadly/unequivocally] negative.

The combination of these factors will [may arguably/will obviously] lead to cuts in nonessential spending. This, in turn, will [might conceivably/will by necessity] reduce the revenue flowing into this company, because while some purchases at retail stores are essential, [there is tentative evidence that/it is perfectly well-known that] most reflect non-essential spending. This is precisely the type of spending that will [might potentially/will undoubtedly] fall as consumers change their behavior. Overall, [I think it is conceivable that/I am confident] this means that the revenue growth of this company will [imaginably/definitely] fall strongly over the forthcoming year. I am highly confident [I am not at all confident] about this forecast.

Outro

This chain is one of the biggest employers and providers of consumer goods in the US, so it is important to understand how its performance will evolve over the next year.

Naturalistic

Introduction

This prediction is about the annual revenue growth of a large US retail company, and specifically whether it will be higher or lower than it was last year.

Increase and High Reliability

This enterprise has strategically positioned itself in the market by offering cheaper and more cost-effective products than its competitors. This strategic position is about to pay off, driving up the company's revenue growth going forward. What is the basis for this prediction?? 20 years of professional experience in this sector, as well as a comprehensive set of reports and historical analyses compiled by our market analysts, tell me that recent economic developments, including elevated inflation rates and an uptick in interest rates, are certain to cause a critical shift in consumer behavior.

Specifically, consumers will gravitate towards cheaper, cost-effective options like the ones offered by this company. As their disposable income decreases due to the adverse macroeconomic conditions, they'll inevitably reorient themselves towards more affordable retailers. In other words, I'm highly confident that economic conditions are driving buyers towards the exact, cost-competitive market niche occupied by this enterprise. This is a well-documented dynamic and has formed part of this company's core business strategy for many decades. It has also been replicated successfully by retailers in other countries, so there's a mountain of evidence backing this strategy. I can therefore predict that this company's revenue growth over the next year will very strongly increase.

Increase and Low Reliability

This company, um, has prices that might be, like, a bit lower than other companies selling similar stuff, like that convenience store around the corner here and I think they're getting

less (...?), wait no, yeah, more money recently because... uh... things are costing more and the banks are charging more to borrow money... or something like that. I think, like, that's because of the interest rate (?) situation, I don't really know who sets the interest rates, I think it's maybe some part of the government, but anyways I've heard they've been higher recently, because they've been raised by whoever controls them.

I heard from a buddy of mine whose cousin - or uncle? not sure - uh is an economist that this kind of economic stuff probably makes people want to buy cheaper things, like uh, like from this company. But I don't understand much about how all this business stuff works and don't have much confidence in any of this, you know. I'm guessing, um, this whole thing with people buying more from this company probably is going to keep happening, and so probably, uh, the amount of money this company makes over the next year is gonna very strongly increase.

Decrease and High Reliability

This enterprise is bracing for a significant headwind, as there's a tangible drop in consumer spending on non-essential items. The background here is a combination of escalating interest rates and sustained inflation, which have substantially depleted consumers' piggy banks. Higher interest rates increase payment requirements for variable-rate mortgages, squeezing the disposable income of families holding those mortgages, and elevate borrowing costs more generally. Inflation, meanwhile, eats into consumers' savings and incomes, reducing their purchasing power. The well-documented consequence of these dynamics is that consumers cut back on nonessential spending, hurting the bottom line of retail businesses that rely on that spending. This pattern has been well-known and feared in the retail sector for decades.

To arrive at my forecast, I've thoroughly sifted through economic indicators and market analytics, collecting analyses from a wide range of perspectives, all of which point in the same fundamental direction. My highly confident assessment—based on this examination

of the evidence as well as several decades working in this industry—is that consumer purse strings will undoubtedly continue to tighten, with no sign of relief for at least the next several months. As a result, I'm projecting that this particular company's revenue growth over the next year will very strongly decrease.

Decrease and Low Reliability

So, this company might be about to have a, uh, rough time, 'cause, um, people aren't wanting to spend their money on things they don't really need. I was talking to some guys at a bar last night and they were saying that this maybe had something to do with... like, the central bank printing more money or something like that... oh, right, I remember, the central bank prints more money, I guess, and prices of stuff go up as a result—I can't remember why but I think that's the idea. And so anyways, this has been, like, chewing up people's savings, I guess, although I don't understand much about how all this economy stuff works and don't have much confidence in any of this you know.

I'm thinking, um, that because people may not wanna spend as much, this company might not make as much money as before, because people are buying less of its stuff. Which obviously is pretty bad from, like, a money-making perspective, and, I mean, revenue is just about making money, right? Or is that profit? Anyways... uh, I think this means the company's revenue growth is going to very strongly decrease in the next year.

Outro

This chain is one of the biggest employers and providers of consumer goods in the US, so it is important to understand how its performance will evolve over the next year.

Home price growth in a large US city

Modular

In the module treatment respondents receive either markers indicating (i) low reliability, (ii) high reliability or (iii) they receive no such markers. The markers are displayed in [].

Introduction

This prediction is about annual house price growth in a large US city, and specifically whether it will be higher or lower than it was last year.

High

The latest figures [seem to/clearly] show a steep plunge in the issuance of new residential construction permits in this city. This [possibly/inevitably] means fewer houses will be built in the near future, due to these regulatory barriers. This [tentative evidence/obvious fact] is notable given that housing supply is already lagging behind fast-growing demand in this city, as people look to move to the economically booming metropolis. The [admittedly mixed/unshakably consistent] evidence suggests that these kinds of supply/demand gaps are [in some cases/always] important drivers of house price growth.

Specifically, if supply lags behind demand, competition among buyers for the limited pool of available houses [under very specific conditions/necessarily] increases house price growth. This is a dynamic that has been theorized for a long time and that is backed by [some suggestive/ironclad] statistical evidence. Given the [vague/clear] evidence for a widening supply-demand gap caused by reduced construction permitting, my overall conclusion is that house price growth in this city [might conceivably/will certainly] will strongly increase substantially over the next 12 months. I am highly confident [That said, I am not at all confident] about this prediction.

Low

Mortgage rates, which have been climbing rapidly over the past several months, [appear to be/are very clearly] are pricing out millions of potential homebuyers [in specific markets/nationwide]. Higher mortgage rates raise the total expected cost of buying a first home, and research [in certain conditions/consistently] shows strong sensitivity of housing demand to mortgage rates [, although the overall picture is very mixed/a universal phenomenon]. Additionally, higher mortgage rates [in some cases/inevitably] raise refinancing costs for families interested in selling and upgrading their homes, causing them to never look for a new home in the first place.

Overall this means that higher mortgage rates [might have the potential to/definitely] strongly drive down housing demand, which will [potentially/certainly] increase house price growth if supply remains constant. Since the supply of housing [sometimes/always] remains static in the short term because houses take a long time to build, we can conclude [with considerable uncertainty/with complete certainty] that demand-side factors will drive changes in house price growth over the next 12 months. As a consequence of all these factors, we can therefore conclude [with significant doubt/with very high confidence] that house price growth will strongly decrease over the next year. I am highly confident [That said, I am not at all confident] about this forecast.

Outro

House prices in a city are a key indicator of economic activity with important implications for the health of the city's economy.

Naturalistic

Introduction

This prediction is about annual house price growth in a large US city, and specifically whether it will be higher or lower than it was last year.

Increase and High Reliability

A careful inspection of recent trends in housing supply and housing demand in this city lead to the unavoidable conclusion that house price growth in the city is due for a substantial increase. Specifically, I've extensively analyzed the latest data on the issuance of new residential construction permits within this city which makes me highly confident about what's going on. The data clearly show a sharp drop, which will lead to a noticeable slowdown in the supply of new housing over the next 12 months as construction stalls in the face of bureaucratic restrictions. In addition to documenting this in the data, I've spoken to a set of major housing developers I know through two decades of professional experience in this sector, who have unanimously confirmed this key observation.

Demand, meanwhile, shows no sign of slowing down its rapid growth; a range of flagship indicators show that migration into this city is continuing steadily. It's well-known that a supply slump combined with consistently roaring demand leads necessarily to increasing house price growth. The consistent story told by the variety of data sources and consultations I've drawn on leads me to predict that house price growth in this city will very strongly increase over the next year.

Increase and Low Reliability

So, this is not my wheelhouse, but I got to thinking recently that, uh, house prices here might start growing even faster. I mean, basically, I talked to some people on the street the other day and one of them told me, uh, that they did not get their - I think - building license

recently. They basically complained about the city and, like, how slow they've recently become with these things, or something like that. And I was trying to figure out what that might mean, for like, the housing market, and the best I could come up with is, well, if it's harder to build houses, because of, you know, these licensing problems, then... there'll be fewer houses to go around!

And that means houses will become cheaper. No, sorry, more expensive. Yeah. I can't really think of anything else that might, uh, conflict with this prediction, but I mean I'm not confident, this is all not my cup of teas. But I like making predictions and bets on markets, it's like sports betting, you know, it's fun and exciting. So anyways, if all that is true,I guess that house price growth over the next year might, um, very strongly increase, but you know, it's all Greek to me really.

Decrease and High Reliability

Every reputable forecasting institution agrees that recent increases in mortgage rates, driven by the Federal Reserve's interest rate hikes, will undoubtedly lead to a sharp decline in house price growth in this city. The basic principles and mechanisms that underlie this phenomenon are straightforward and backed by an abundance of empirical evidence, making them extremely well-documented. When mortgage rates go up, financing home purchases becomes considerably more difficult for most potential buyers, causing demand for homes to rapidly drop off. Supply of housing, meanwhile, remains rigid in the short run. Falling relative demand therefore drives declines in house price growth.

I'm confidently making this prediction because the relationship between changing mortgage rates and house prices is extremely well established and robust in the data, and mortgage rates have strong predictive power, especially on short-run horizons in the vicinity of a year or two. We can therefore formulate a virtually definitive prediction about the near-term future of house prices in this city. Given that the signs are entirely clear, and based on my

professional experience and careful data analysis, I'm projecting that house price growth over the next year in this city will very strongly decrease.

Decrease and Low Reliability

So, you know, I've never bought a house, don't own a house, but I've heard from some friends that, um, the amount of money people are paying on their mortgages is going up, or for some people at least, I think. And according to, I think one of my friends, this means house price growth is going to, uh, drop off, yeah. I'm pretty sure it was "drop off." I'm trying to remember exactly what they were saying because honestly, I was pretty tired, and I'm not sure if I remember it correctly, I'm doing my best.

So anyways, mortgages are a pretty important issue; I don't follow the news much in general but I've definitely heard the news people talk a lot about, em, mortgages. And I guess what my friend was saying was that when mortgages, uh, get more expensive, then people buy houses less, right. And they were saying mortgages were, like, going up because of the Feds, some part of the Feds. And so when people buy less houses, that means house prices don't grow as much, so house price growth decreases very strongly, so I guess that's what's going to happen here over the next year, but you know, it's all Greek to me really.

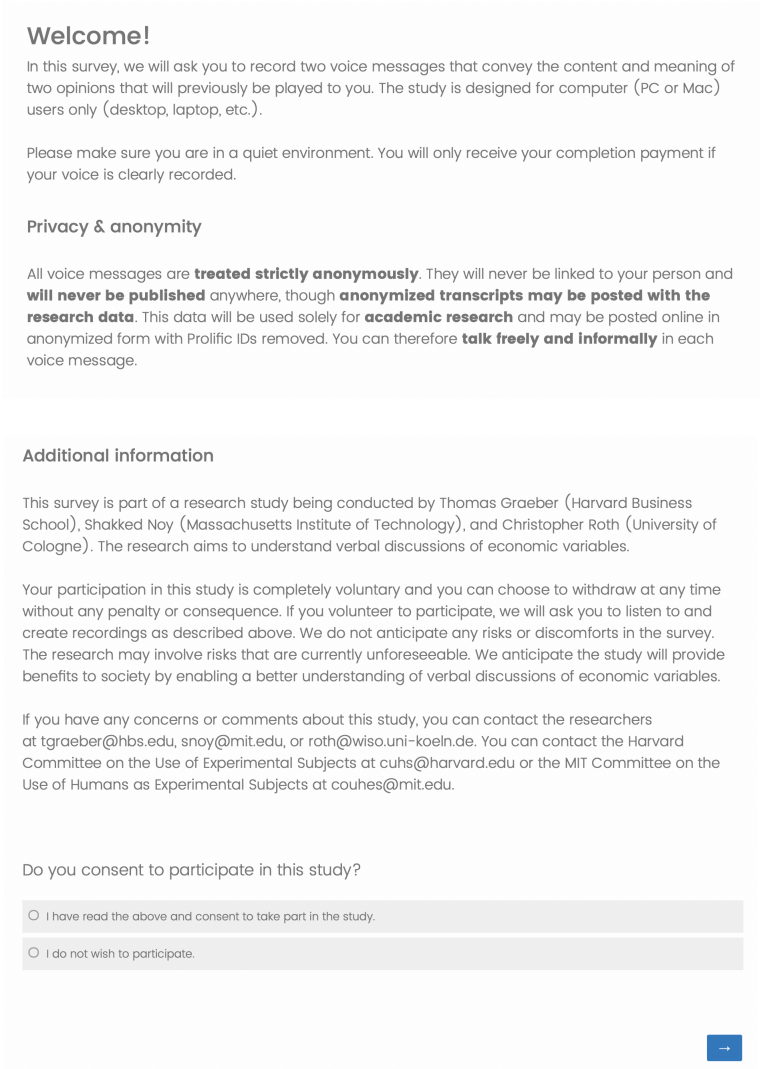
Outro

House prices in a city are a key indicator of economic activity with important implications for the health of the city's economy.

C Experimental Instructions

C.1 Instructions: Main Transmitter experiment

Introduction



Welcome!

In this survey, we will ask you to record two voice messages that convey the content and meaning of two opinions that will previously be played to you. The study is designed for computer (PC or Mac) users only (desktop, laptop, etc.).

Please make sure you are in a quiet environment. You will only receive your completion payment if your voice is clearly recorded.

Privacy & anonymity

All voice messages are **treated strictly anonymously**. They will never be linked to your person and **will never be published** anywhere, though **anonymized transcripts may be posted with the research data**. This data will be used solely for **academic research** and may be posted online in anonymized form with Prolific IDs removed. You can therefore **talk freely and informally** in each voice message.

Additional information

This survey is part of a research study being conducted by Thomas Graeber (Harvard Business School), Shakked Noy (Massachusetts Institute of Technology), and Christopher Roth (University of Cologne). The research aims to understand verbal discussions of economic variables.

Your participation in this study is completely voluntary and you can choose to withdraw at any time without any penalty or consequence. If you volunteer to participate, we will ask you to listen to and create recordings as described above. We do not anticipate any risks or discomforts in the survey. The research may involve risks that are currently unforeseeable. We anticipate the study will provide benefits to society by enabling a better understanding of verbal discussions of economic variables.

If you have any concerns or comments about this study, you can contact the researchers at tgraeber@hbs.edu, snoy@mit.edu, or roth@wiso.uni-koeln.de. You can contact the Harvard Committee on the Use of Experimental Subjects at cuhs@harvard.edu or the MIT Committee on the Use of Humans as Experimental Subjects at couhes@mit.edu.

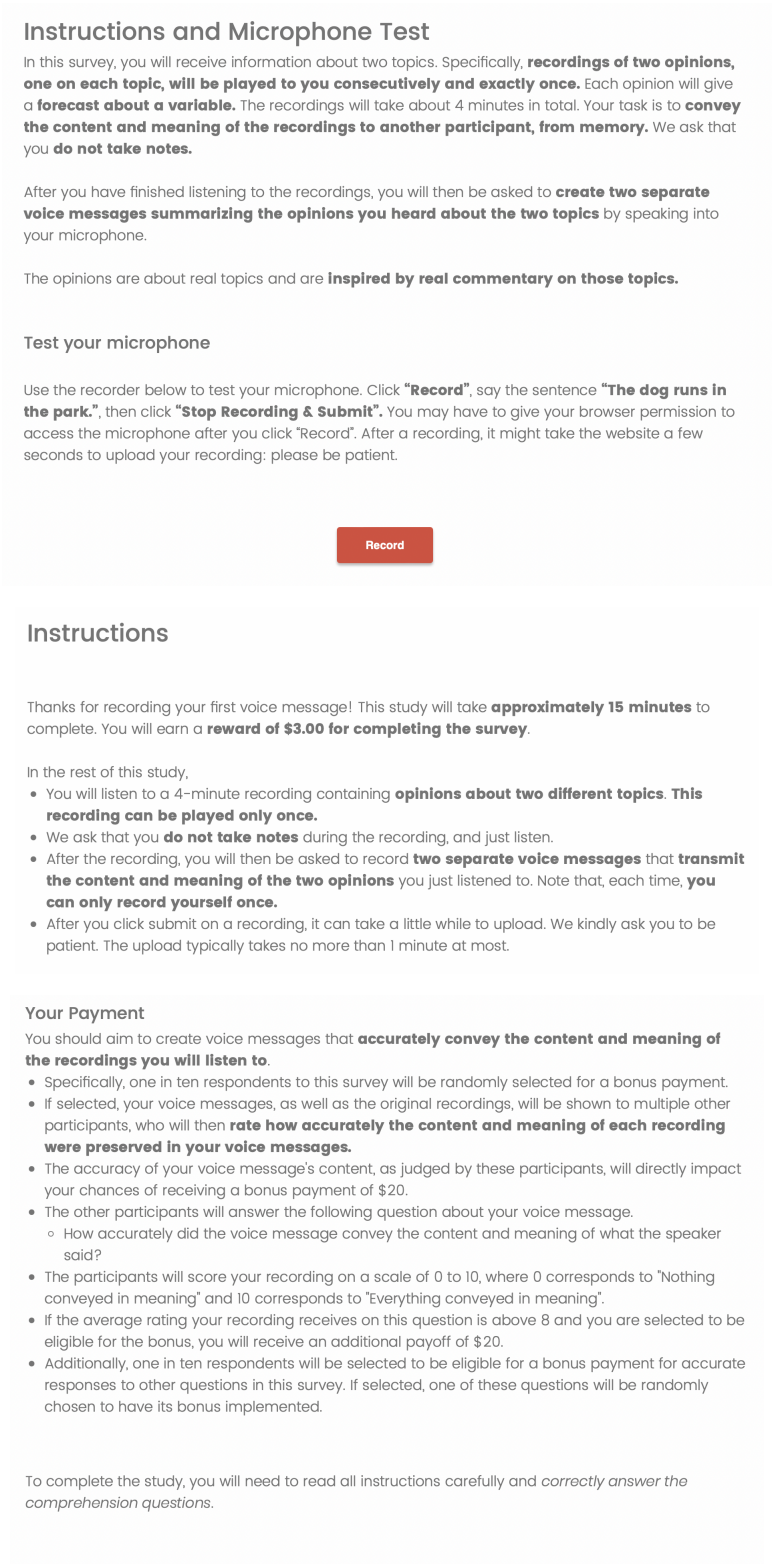
Do you consent to participate in this study?

○ I have read the above and consent to take part in the study.

○ I do not wish to participate.

→

Instructions and Microphone Test



Instructions and Microphone Test

In this survey, you will receive information about two topics. Specifically, **recordings of two opinions, one on each topic, will be played to you consecutively and exactly once.** Each opinion will give a **forecast about a variable.** The recordings will take about 4 minutes in total. Your task is to **convey the content and meaning of the recordings to another participant, from memory.** We ask that you **do not take notes.**

After you have finished listening to the recordings, you will then be asked to **create two separate voice messages summarizing the opinions you heard about the two topics** by speaking into your microphone.

The opinions are about real topics and are **inspired by real commentary on those topics.**

Test your microphone

Use the recorder below to test your microphone. Click **"Record"**, say the sentence **"The dog runs in the park."**, then click **"Stop Recording & Submit".** You may have to give your browser permission to access the microphone after you click "Record". After a recording, it might take the website a few seconds to upload your recording: please be patient.

Record

Instructions

Thanks for recording your first voice message! This study will take **approximately 15 minutes** to complete. You will earn a **reward of $3.00 for completing the survey**.

In the rest of this study,

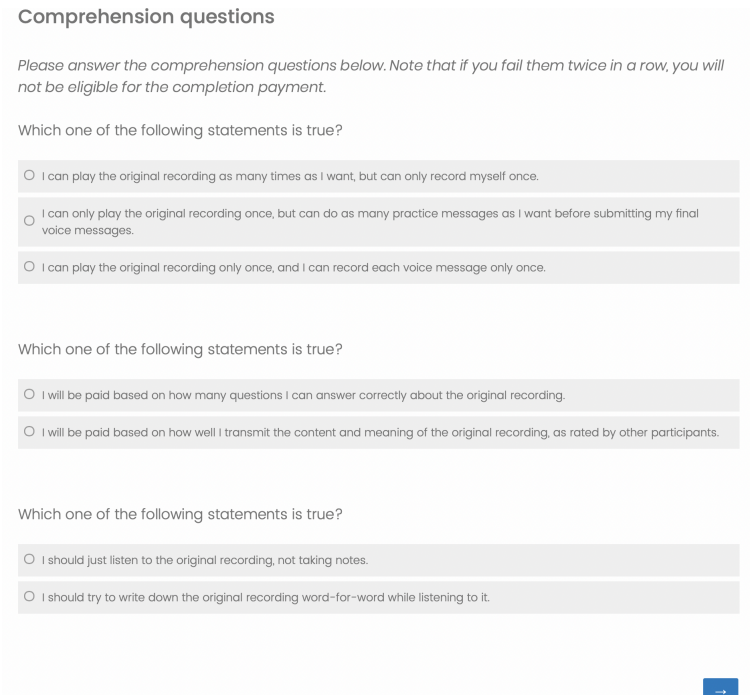
- You will listen to a 4-minute recording containing **opinions about two different topics**. **This recording can be played only once.**
- We ask that you **do not take notes** during the recording, and just listen.
- After the recording, you will then be asked to record **two separate voice messages** that **transmit the content and meaning of the two opinions** you just listened to. Note that, each time, **you can only record yourself once.**
- After you click submit on a recording, it can take a little while to upload. We kindly ask you to be patient. The upload typically takes no more than 1 minute at most.

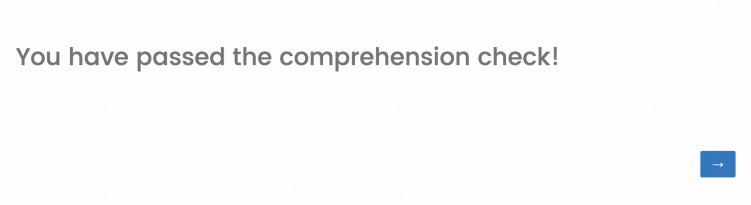
Your Payment

You should aim to create voice messages that **accurately convey the content and meaning of the recordings you will listen to**.

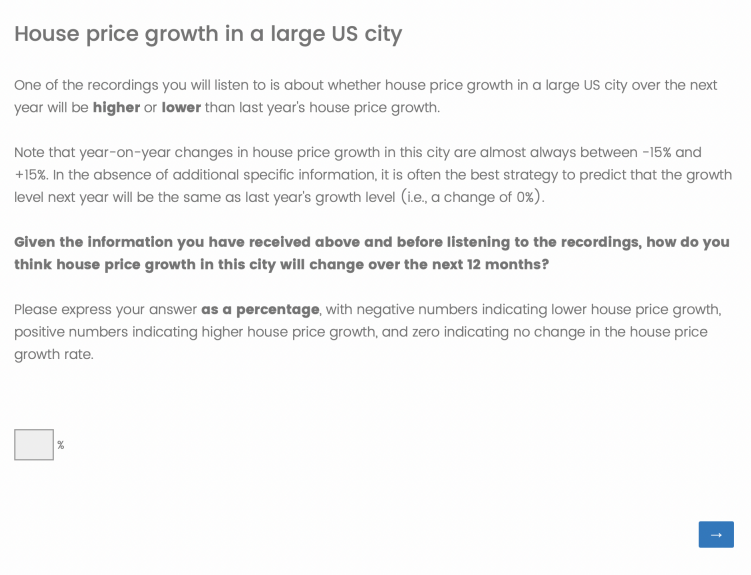
- Specifically, one in ten respondents to this survey will be randomly selected for a bonus payment.
- If selected, your voice messages, as well as the original recordings, will be shown to multiple other participants, who will then **rate how accurately the content and meaning of each recording were preserved in your voice messages.**
- The accuracy of your voice message's content, as judged by these participants, will directly impact your chances of receiving a bonus payment of $20.
- The other participants will answer the following question about your voice message.
  - How accurately did the voice message convey the content and meaning of what the speaker said?
- The participants will score your recording on a scale of 0 to 10, where 0 corresponds to "Nothing conveyed in meaning" and 10 corresponds to "Everything conveyed in meaning".
- If the average rating your recording receives on this question is above 8 and you are selected to be eligible for the bonus, you will receive an additional payoff of $20.
- Additionally, one in ten respondents will be selected to be eligible for a bonus payment for accurate responses to other questions in this survey. If selected, one of these questions will be randomly chosen to have its bonus implemented.

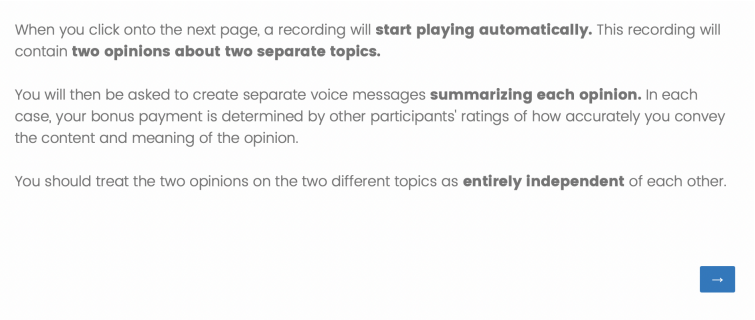
To complete the study, you will need to read all instructions carefully and *correctly answer the comprehension questions*.



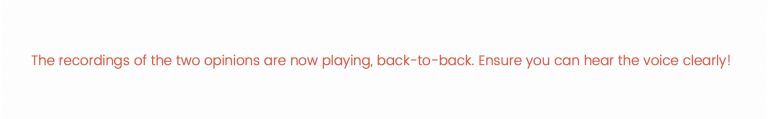


Prior Beliefs

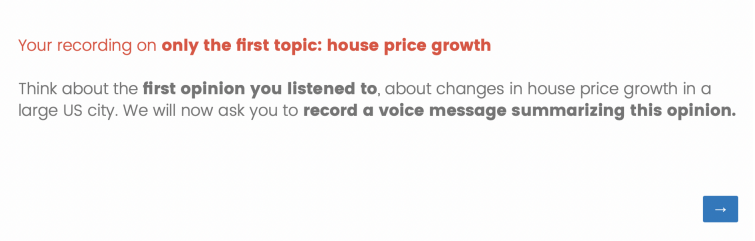




Original Recordings



Recording the Voice messages



When you click onto the next page, **a recording of you will start automatically** and you will have to start talking. You'll click "Stop Recording" when you finish talking. You can only record yourself once.

Your recording should **only be about** the opinion you heard about **changes in house price growth in a large US city,** NOT about the other opinion.

Remember that your bonus payment is determined by other participants' ratings of how accurately you convey the content and meaning of the opinion about house price growth.

→

Your voice message about **the change in house price growth in a large US city.**

The recording of your voice message has started automatically. Please talk into your microphone, and submit once you're done.

After submitting, it may take a few seconds before the next page appears.

Stop Recording & Submit

Your recording on **only the second topic: change in revenue growth in a retail company**

Think about the **second recording you listened to**, about the change in revenue growth of the large US retail company. We will now ask you to **record a voice message summarizing this opinion.**

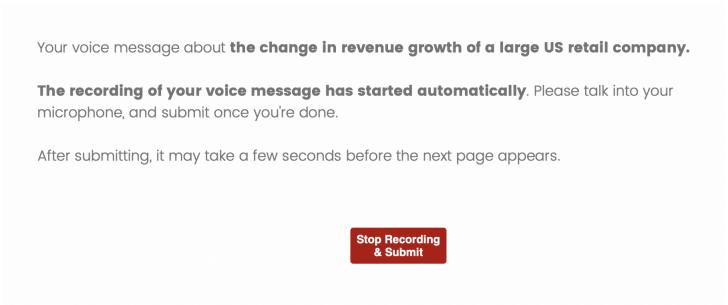
→

When you click onto the next page, **a recording of you will start automatically** and you will have to start talking. You'll click "Stop Recording" when you finish talking. You can only record yourself once.

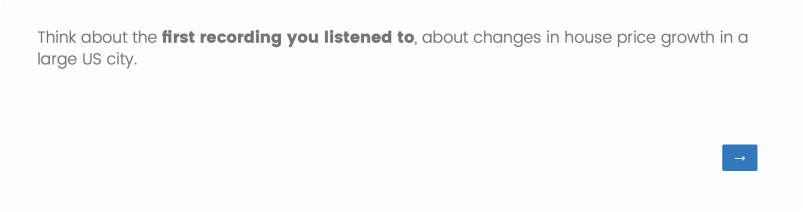
Your recording should **only be about** the opinion you heard about **the change in revenue growth of a large US retail company,** NOT about the other opinion.

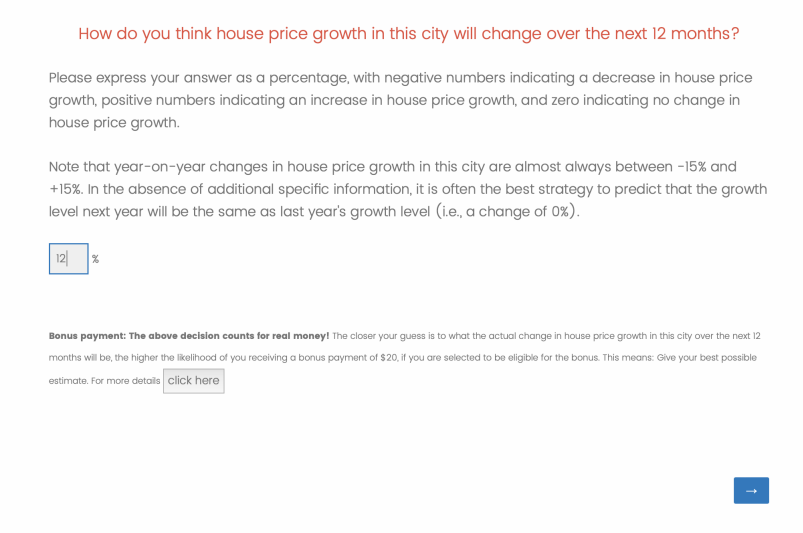
Remember that your bonus payment is determined by other participants' ratings of how accurately you convey the content and meaning of the opinion on revenue growth.

→


Your voice message about **the change in revenue growth of a large US retail company.**
The recording of your voice message has started automatically. Please talk into your microphone, and submit once you're done.
After submitting, it may take a few seconds before the next page appears.
Stop Recording & Submit

Own Beliefs


Think about the **first recording you listened to**, about changes in house price growth in a large US city.
→


How do you think house price growth in this city will change over the next 12 months?
Please express your answer as a percentage, with negative numbers indicating a decrease in house price growth, positive numbers indicating an increase in house price growth, and zero indicating no change in house price growth.
Note that year-on-year changes in house price growth in this city are almost always between -15% and +15%. In the absence of additional specific information, it is often the best strategy to predict that the growth level next year will be the same as last year's growth level (i.e., a change of 0%).
12 %
Bonus payment: The above decision counts for real money! The closer your guess is to what the actual change in house price growth in this city over the next 12 months will be, the higher the likelihood of you receiving a bonus payment of $20, if you are selected to be eligible for the bonus. This means: Give your best possible estimate. For more details click here
→

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Please express your answer as a percentage, with negative numbers indicating a decrease in house price growth, positive numbers indicating an increase in house price growth, and zero indicating no change in house price growth.

Note that year-on-year changes in house price growth in this city are almost always between -15% and +15%. In the absence of additional specific information, it is often the best strategy to predict that the growth level next year will be the same as last year's growth level (i.e., a change of 0%).

[ ] %

Bonus payment: The above decision counts for real money! The closer your guess is to what the actual change in house price growth in this city over the next 12 months will be, the higher the likelihood of you receiving a bonus payment of $20, if you are selected to be eligible for the bonus. This means: Give your best possible estimate. For more details click here

Probability of winning $20 [in %] = 100 - 10 (Estimate [in %] - True change in house price growth [in %])^2. While this formula might look complicated, what it means is simple: To maximize your chances of winning the bonus, you should give your best possible estimate given the information you have.

→

Now think about **the person whose opinion about house price growth you learned about.**

How do you think **this person predicts** house price growth in this city will change over the next 12 months?

[ ] %

→

Your task is to guess how other people would respond to the following question. Below, enter your best guess of what people would on average respond if asked the question in red.

How **reliable** do you think this person's prediction is?

Specifically, what do you think is **the probability** that this person's forecasts about changes in house price growth in this city **are roughly correct?** Concretely, assuming that the true change in house price growth is a number called X, what do you think is the likelihood that this person's prediction will fall within 1% of X, i.e. between X-1% and X+1%?

Extremely unreliable 0% 10% 20% 30% 40% 50% 60% 70% 80% 90% Extremely reliable 100%

Bonus payment: The above decision counts for real money! The closer your guess is to the average guess that a different group of participants made for the same question after listening to the same recording, the higher the likelihood of you receiving a bonus payment of $20, if you are selected to be eligible for the bonus. This means: Give your best possible estimate. For more details click here

Probability of winning $20 [in %] = 100 - 2 (Estimate [in %] - Average estimate of others [in %])^2. While this formula might look complicated, what it means is simple: To maximize your chances of winning the bonus, you should give your best possible answer given the information you have.

→

Think about the **second recording you listened to**, about the change in revenue growth of the large US retail company.

→

How do you think the revenue growth of this company will change over the next 12 months?

Please express your answer as a percentage, with negative numbers indicating a decrease in revenue growth, positive numbers indicating an increase in revenue growth, and zero indicating no change in revenue growth.

Note that year-on-year changes in revenue growth of this company are almost always between -10% and +10%. In the absence of additional specific information, it is often the best strategy to predict that the growth level next year will be the same as last year's growth level (i.e., a change of 0%).

%

Bonus payment: The above decision counts for real money! The closer your guess is to what the actual change in revenue growth in this company over the next 12 months will be, the higher the likelihood of you receiving a bonus payment of $20, if you are selected to be eligible for the bonus. This means: Give your best possible estimate. For more details click here

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Now think about **the person whose opinion about revenue growth you learned about.**

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How do you think **this person predicts** revenue growth in this company will change over the next 12 months?

[ ] %

Bonus payment: The above decision counts for real money! The closer your guess is to the average guess that a different group of participants made for the same question after listening to the same recording, the higher the likelihood of you receiving a bonus payment of $20, if you are selected to be eligible for the bonus. This means: Give your best possible estimate. For more details click here

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→

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How **reliable** do you think this person's prediction is?

Specifically, what do you think is **the probability** that this person's forecasts about changes in this company's revenue growth **are roughly correct?** Concretely, assuming that the true change in revenue growth is a number called X, what do you think is the likelihood that this person's prediction will fall within 1% of X, i.e. between X-1% and X+1%?

Extremely unreliable — Extremely reliable

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Bonus payment: The above decision counts for real money! The closer your guess is to the average guess that a different group of participants made for the same question after listening to the same recording, the higher the likelihood of you receiving a bonus payment of $20, if you are selected to be eligible for the bonus. This means: Give your best possible estimate. For more details click here

Probability of winning $20 [in %] = 100 - 2 (Estimate [in %] - Average estimate of others [in %])^2. While this formula might look complicated, what it means is simple: To maximize your chances of winning the bonus, you should give your best possible answer given the information you have.

→

Thank you for completing that section. Please remember that these were **example opinion pieces inspired by real commentary, not themselves real opinion pieces.**

Other people saw opinion pieces arguing for the opposite conclusions.

Did you experience any technical difficulties? If so, please let us know below.

While you were listening to the audio recordings, did you take written notes on their contents?

Please answer honestly. Your answer to this question will not affect your payment in any way.

- ○ Yes
- ○ No

→

Eliciting Participant Characteristics

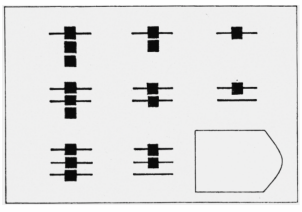
We will now ask you a series of timed questions.

Please do your best and do not use the Internet or other external resources. Your answers to these questions will not affect your bonus payment.

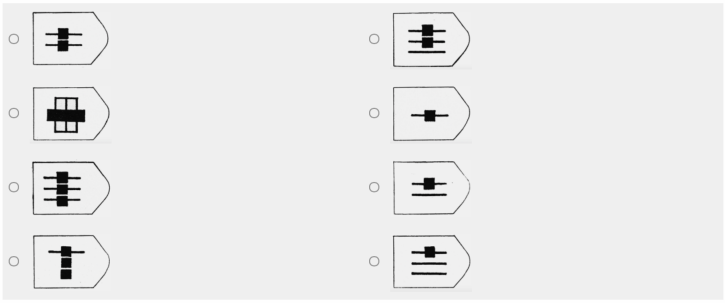
→

Picture Puzzle (45 second timer)

Each row below gives an example of the **same pattern.** Your job is to **guess which of the 8 pictures below completes the third row.**



Which of the following options **completes the third row?**

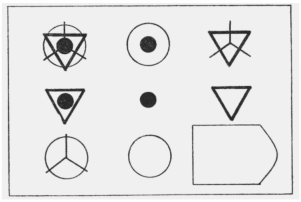


3|2

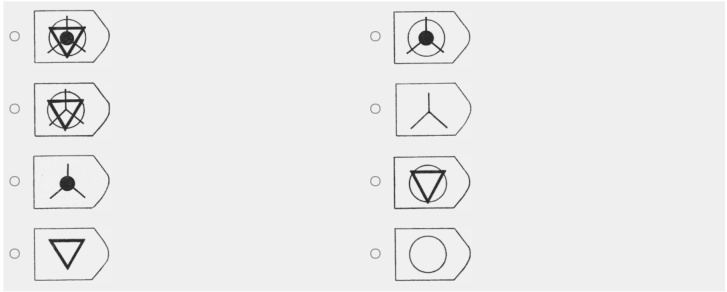
→

Picture Puzzle (45 second timer)

Each row below gives an example of the **same pattern.** Your job is to **guess which of the 8 pictures below completes the third row.**



Which of the following options **completes the third row?**

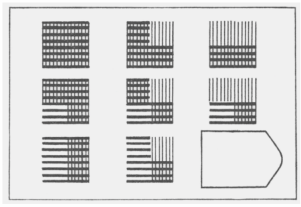


3|3

→

Picture Puzzle (45 second timer)

Each row below gives an example of the **same pattern.** Your job is to **guess which of the 8 pictures below completes the third row.**



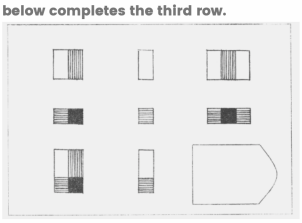
Which of the following options **completes the third row?**

33

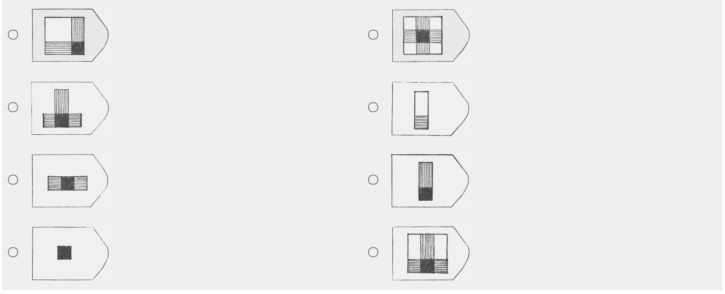
→

Picture Puzzle (45 second timer)

Each row below gives an example of the **same pattern.** Your job is to **guess which of the 8 pictures below completes the third row.**



Which of the following options **completes the third row?**

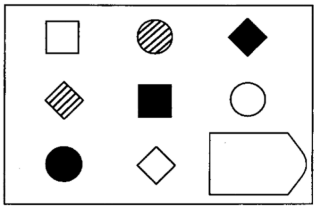


3|6

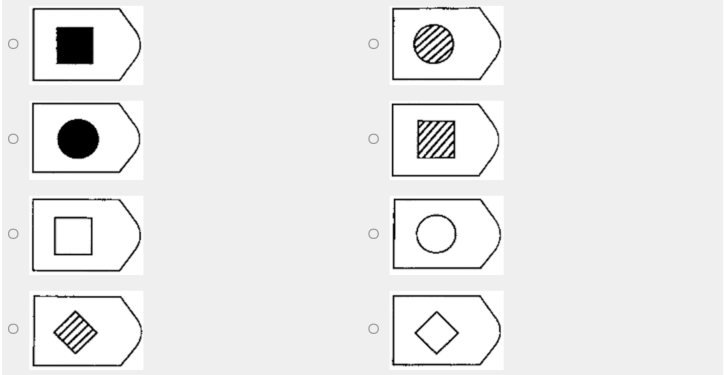
→

Picture Puzzle (45 second timer)

Each row below gives an example of the **same pattern.** Your job is to **guess which of the 8 pictures below completes the third row.**



Which of the following options **completes the third row?**

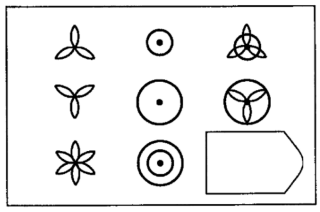


3|4

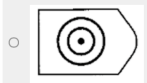
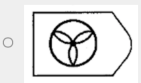
→

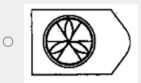
Picture Puzzle (45 second timer)

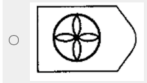
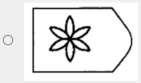
Each row below gives an example of the **same pattern.** Your job is to **guess which of the 8 pictures below completes the third row.**



Which of the following options **completes the third row?**



3 4

→

Final questionnaire

To complete, please fill out the following questionnaire.

Your sex:

- Male
- Female
- Other

Your age:

What is the highest level of school you have completed or the highest degree you have received?

- ○ Less than high school degree
- ○ High school graduate (high school diploma or equivalent including GED)
- ○ Some college but no degree
- ○ Associate degree in college (2-year)
- ○ Bachelor's degree in college (4-year)
- ○ Master's degree
- ○ Doctoral degree
- ○ Professional degree (JD, MD)

Which statement best describes your current employment status?

- ○ Working (paid employee)
- ○ Working (self-employed)
- ○ Not working
- ○ Prefer not to answer

C.2 Instructions: Main Listener experiment

Introduction

Welcome!

In this survey, we will ask you to **listen to two voice message** and **answer various questions about them**. The study is designed for computer (PC or Mac) users only (desktop, laptop, etc.) and only works on Firefox and Chrome.

Instructions

In this survey, you will hear two **1-2 minute voice recordings** about two topics: one about changes in house price growth in a large US city, and one about changes in the revenue growth of a large US retail company.

Each time, the recording will be either

- **an original opinion** about the topic, or
- a **voice message summarizing the original opinion,** recorded by another participant in this study who previously listened to the original opinion.

The voice recording will be played to you exactly once.

The original opinions are are about changes in revenue growth of an actual company and changes in house price growth in a large US city, and are inspired by real commentary on those topics.

Your task is to **answer questions on what you think will happen to the variable that the recording is about** (change in house price growth or change in revenue growth). We will also ask you questions about what you guess **the person who recorded the original opinion thinks** about the variable.

Test your speaker

Use the play button below to test your speaker. Click "Play" to play back a voice message and select the sentence that you heard in the text box below.

Please select the sentence that you listened to in the voice message above:

The koala climbs up the tree.	The cat waits for the mouse to come back.
The dog runs in the park.	The fox sneaks through the garden.
The lion looks at the gazelle.	The turtle swims in the sea.

Instructions

Instructions

Thanks for listening to your first recording! This study will take **approximately 10 minutes** to complete. You will earn a **reward of $2.00 for completing the survey**.

In the rest of this study, there will be two blocks, covering changes in house price growth in a large US city and changes in revenue growth in a large US company, not necessarily in that order. In each block, the following will happen.

- You will listen to a **short 1-2 minute recording** about a topic. The recording will either be **an original opinion**, or **another participant's summary of that original opinion.** The other participant was paid to pass on the content and meaning of the original opinion as accurately as possible.
- The recording can be played exactly once.
- Each time, you should pay attention to the recording's **prediction** about the variable being discussed, and the recording's assessment of the **reliability of that prediction.**
- After listening to the recording, you will be asked several questions relating to **what you think** about the variable discussed in the recording over the next 12 months, and about **what you guess the person giving the original opinion thinks** about the variable.
- In some voice messages you only hear the other person speaking after a small delay, because the speaker may have paused before speaking. Please be patient.

Your Bonus Payment

One of every 30 participants is eligible for a **bonus payment** of up to $10. Whether and how large a bonus payment is that you receive depends on how **accurately you answer the questions about the variable over the next 12 months and about the expert's opinion**.

If you are selected to be eligible for a bonus payment, one of the questions will be randomly selected and your answer to that randomly-chosen question determines your bonus. On each question, you will receive information on how the bonus is calculated. Your bonus payment will be made as soon as the true house price growth rate in the city over the next 12 months, and the true revenue growth rate of the company over the next 12 months, has been announced.

Comprehension questions

Please answer the comprehension questions below. Note that if you fail them twice in a row, you will not be eligible for the completion payment.

Which one of the following statements is true?

- The recordings will be about a new line of products released by the company conducting this survey.
- The recordings will be about US Federal Reserve interest rate policy over the next year.
- The recordings will be about changes in house price growth in a large city and changes in revenue growth in a large company.

Main Experiment

Which one of the following statements is true?

The voice recording will either be a clip from a live TV broadcast, or a recording of someone reading out loud from a major newspaper.

The voice recording will either be an original opinion, or a recording of another participant summarizing the original opinion.

Which one of the following statements is true?

I can listen to the voice recording only once.

I can repeat the voice recording as many times as I want before proceeding to the next page.

I can go back onto the voice recording page and listen to it again, later in the survey.

→

Revenue growth of a large US company

On the page after next, a recording will **start playing automatically.** The recording is **a summary of an original opinion** about **changes in revenue growth of a large US company in the next 12 months.**

Please pay close attention to the recording. It may take a few seconds for the recording to start. We ask you to **not** take notes but focus on listening.

After listening to the recording, you will be asked the following questions:

> How do you think the revenue growth of this company will change over the next 12 months?
>
> Thinking about the person whose opinion was summarized in the recording, how do you think this person predicts the revenue growth of this company will change over the next 12 months?
>
> Thinking about the person whose opinion was summarized, how reliable do you think their prediction is?

Each question is equally likely to be chosen for the bonus payment.

→

For context, note that year-on-year changes in revenue growth in this company are almost always between -10% and +10%. In the absence of additional specific information, it is often the best strategy to predict that the growth level next year will be the same as last year's growth level (i.e., a change of 0%).

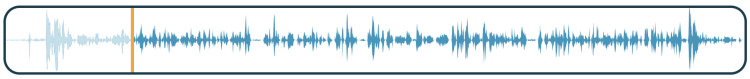
Given the information you have received above and before listening to the recording, how do you think revenue growth in this company will change over the next 12 months?

Please express your answer **as a percentage**, with negative numbers indicating a decrease in revenue growth, positive numbers indicating an increase in revenue growth, and zero indicating no change in revenue growth.

[ ] %

On the next page, a recording will start playing automatically.

→



We will now ask you questions relating to **what you think** about the revenue growth of this company over the next 12 months.

→

How do you think the revenue growth of this company will change over the next 12 months?

Please express your answer as a percentage, with negative numbers indicating a decrease in revenue growth, positive numbers indicating an increase in revenue growth, and zero indicating no change in revenue growth.

Note that year-on-year changes in revenue growth of this company are almost always between -10% and +10%. In the absence of additional specific information, it is often the best strategy to predict that the growth level next year will be the same as last year's growth level (i.e., a change of 0%).

[ ] %

Bonus payment: The above decision counts for real money! The closer your guess is to what the actual change in revenue growth of this company over the next 12 months will be, the higher the likelihood of you receiving a bonus payment of $20. This means: Give your best possible estimate. For more details click here

→

You just listened to a **summary of an original opinion** about changes in revenue growth in a large US company. The person providing the summary was incentivized to pass on the original opinion as accurately as they could.

Please think of your best guess about **how the person whose opinion was summarized predicts revenue growth in this company will change over the next 12 months.**

Note the following questions are **not about the opinion of the person you just listened to**, but about **the opinion of the person they were summarizing.**

→

How do you think **the person whose opinion was summarized in the recording predicts** the company's revenue growth will change over the next 12?

Please express your answer as a percentage, with negative numbers indicating a decrease in revenue growth, positive numbers indicating an increase in revenue growth, and zero indicating no change in revenue growth.

[ ] %

Bonus payment: The above decision counts for real money! The closer your guess is to the average guess that a different group of participants made for the same question after listening to the same recording, the higher the likelihood of you receiving a bonus payment of $20. This means: Give your best possible estimate. For more details click here

→

How **reliable** do you think the prediction given by the person whose opinion was summarized in the recording is?

Specifically, what do you think is **the probability that this person is roughly correct** about their forecast? Indicate the likelihood with which you think the change in revenue growth over the next 12 months will fall between 2% and 4%.

Extremely unreliable									Extremely reliable
0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

Bonus payment: The above decision counts for real money! To maximize your chances of winning a bonus payment of $20, you should express your true belief about the level of reliability of the person's prediction. For more details click here

→

How clear was the audio in the recording?

Not clear at all — Extremely clear

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

→

How easy did you find it to follow the reasoning in the recording?

Not easy at all — Extremely easy

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

→

House price growth in a large US city

On the page after next, a recording will **start playing automatically.** The recording is **a summary of an original opinion** about **changes in house price growth in a large US city in the next 12 months.**

Please pay close attention to the recording. It may take a few seconds for the recording to start. We ask you to **not** take notes but focus on listening.

After listening to the recording, you will be asked the following questions:

> How do you think house price growth in this city will change over the next 12 months?
>
> Thinking about the person whose opinion was summarized in the recording, how do you think this person predicts house price growth in this city will change over the next 12 months?
>
> Thinking about the person whose opinion was summarized, how reliable do you think their prediction is?

Each question is equally likely to be chosen for the bonus payment.

→

Note that year-on-year changes in house price growth in this city are almost always between -15% and +15%. In the absence of additional specific information, it is often the best strategy to predict that the growth level next year will be the same as last year's growth level (i.e., a change of 0%).

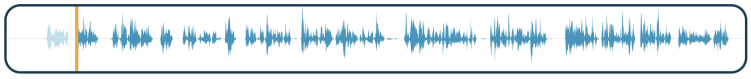
Given the information you have received above and before listening to the recording, how do you think house price growth in this city will change over the next 12 months?

Please express your answer **as a percentage**, with negative numbers indicating a decrease in house price growth, positive numbers indicating an increase in house price growth, and zero indicating no change in house price growth.

[ ] %

On the next page, a recording will start automatically.

→



You just listened to a **summary of an original opinion** about changes in house price growth in a large US city. The person providing the summary was incentivized to pass on the original opinion as accurately as they could.

Please think of your best guess about **how the person whose opinion was summarized predicts house price growth in this city will change over the next 12 months.**

Note these questions are **not about the opinion of the person you just listened to,** but **about the opinion of the person they were summarizing.**

→

How **reliable** do you think the prediction given by the person whose opinion was summarized in the recording is?

Specifically, what do you think is **the probability** that this person's forecasts about house price growth in this city are **roughly correct?** Concretely, assuming that the true change in house price growth is a number called X, what do you think is the likelihood that this person's prediction will fall within 1% of X, i.e. between X-1% and X+1%?

Extremely unreliable — Extremely reliable

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Bonus payment: The above decision counts for real money! The closer your guess is to the average guess that a different group of participants made for the same question after listening to the same recording, the higher the likelihood of you receiving a bonus payment of $20. This means: Give your best possible estimate. For more details click here

We will now ask you questions relating to **what you think** about house prices in this city over the next 12 months.

→

How do you think house price growth in this city will change over the next 12 months?

Please express your answer as a percentage, with negative numbers indicating a decrease in house price growth, positive numbers indicating an increase in house price growth, and zero indicating no change in house price growth.

Note that year-on-year changes in house price growth in this city are almost always between -15% and +15%. In the absence of additional specific information, it is often the best strategy to predict that the growth level next year will be the same as last year's growth level (i.e., a change of 0%).

[ ] %

Bonus payment: The above decision counts for real money! The closer your guess is to what the actual change in house price growth in this city over the next 12 months will be, the higher the likelihood of you receiving a bonus payment of $20. This means: Give your best possible estimate. For more details click here

→

How clear was the audio in the recording?

Not clear at all — Extremely clear

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

→

How easy did you find it to follow the reasoning in the recording?

Not easy at all — Extremely easy

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

→

Did you take notes while listening to the recordings? Your answer to this question will **not** affect your bonus payment, so you can answer honestly.

Yes

No

→

How comfortable did you feel listening to voice recordings of previous respondents?

Very comfortable | Comfortable | Not comfortable | Not at all comfortable

→

Thank you for listening to the recordings! Please remember that the original opinion pieces were inspired by real commentary, they were not themselves real opinion pieces. Other people listened to original opinion pieces arguing for the opposite conclusions.

→

Eliciting Participant Characteristics

Final questionnaire

To complete, please fill out the following questionnaire.

Your sex:

Male

Female

Other

Your age:

Your ethnicity:

- White
- Black or African American
- American Indian or Alaska Native
- Asian
- Native Hawaiian or Pacific Islander
- Other

What is the highest level of school you have completed or the highest degree you have received?

- Less than high school degree
- High school graduate (high school diploma or equivalent including GED)
- Some college but no degree
- Associate degree in college (2-year)
- Bachelor's degree in college (4-year)
- Master's degree
- Doctoral degree
- Professional degree (JD, MD)

Which statement best describes your current employment status?

- Working (paid employee)
- Working (self-employed)
- Not working
- Prefer not to answer

In politics, as of today, do you consider yourself a Republican, a Democrat, or an Independent?

- Democrat
- Republican
- Independent
- Other