ONLINE APPENDIX
for
Intrinsic Information Preferences and Skewness

Appendix A. Experiment 1

A.1. **Protocol Details.** The experiment was run in two waves. A total of 223 subjects participated in treatments T1-T5 in the summer semester of 2015, and a total of 477 subjects participated in treatments T1-T10 in the winter and spring semesters of 2017. There were no differences in subject choices across the two waves in treatments T1-T5. Table 5 reports results by waves.

Table 5. Experiment 1 – Two waves of data collection

		1st wave		Difference	2nd wave	
		N	Percentage	p-value	Percentage	N
T1	$(1,1) \succ (.5,.5)$	43	65%	.341	75%	36
T2	$(.5,1) \succ (1,.5)$	45	82%	.485	76%	33
T3	$(.3,.9) \succ (.9,.3)$	47	68%	.891	67%	36
T4	$(.6,.9) \succ (.9,.6)$	46	70%	.245	81%	32
T5	$(.5,1) \succ (.5,.5)$	42	88%	.681	85%	33

The table reports frequencies of choice and the p–values from χ^2 tests evaluating the significance of the difference in choice frequencies across the two waves of data collection in the Summer semester of 2015 and Winter/Spring semesters of 2017.

A.2. Experimental Materials.

A.2.1. *General Instructions.* Welcome to our informational decision making session. Please read the instructions carefully. We will ask comprehension questions in a little bit. You may have participated in different kinds of studies across campus. The instructions we give in this study are accurate and reflect exactly how the study will unfold. We will explain how the study is programmed, how the computer will determine the questions and information you will see and how you will get paid in accordance with what actually will happen. In other words, there is no deception of any kind and you will be fully informed of the workings of the study at all times.

The session will last 60 minutes. You will receive $7 for your participation. You will also get a pen or a postcard and may earn an additional $10 as a result of luck. If you fail to follow the instructions or disturb the flow of the study in any way, you will be asked to leave the study.

Please silence your phones and put your belongings under the table, and leave them alone during the entire study. We need your full engagement; even when you are not actively participating in the study, please wait patiently and refrain from using your cell phone, checking email, surfing the internet, etc.

This is a silent study. Please do not make any noise, you will be asked to leave the study without any compensation if you do. If you are having technical difficulties at any time, raise your hand quietly and the experimenter will come to help. You are not allowed to ask questions about the content of the study to the experimenter, please read and listen to the instructions very carefully to avoid confusion. All information pertinent to the study is contained in the instructions. Therefore it is of utmost importance that you follow the instructions carefully. At certain points in time, we may also ask you basic facts about the study to make sure you are following what is going on.

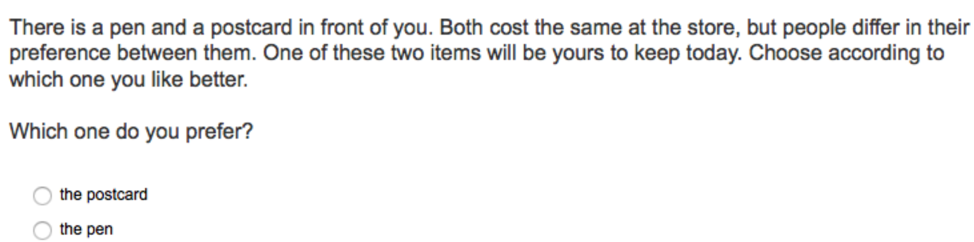
In this session, you will participate in two different studies. In Study 1, we will ask you to indicate your preference between the pen and the postcard and answer related questions. In Study 2, you will participate in a lottery with the raffle ticket you got when you arrived. If you win the lottery, you will earn an additional $10. If you lose the lottery, you will not get any additional money. Both studies will be explained in detail with video instructions. Your decisions and payments will depend on your understanding of these instructions.

In both studies, we will be using an independent web service (http://reporting.qualtrics.com/projects/randomNumGen.php) to randomly pick numbers between 1 and 10. These numbers will be helpful in determining outcomes in uncertain events. Each number has an equal chance of being picked for any given event. The numbers are drawn completely randomly and do not follow any particular sequence.

All payments will be made in cash at the end of the study.

A.2.2. *Practice Round.* The participants made a choice between a pen and a postcard and indicated the preference strength for their choice in a seemingly unrelated task. This task was included to provide practice with the willingness to switch elicitation.

Figure 5. Screenshot: Elicitation of preference in the practice round


There is a pen and a postcard in front of you. Both cost the same at the store, but people differ in their preference between them. One of these two items will be yours to keep today. Choose according to which one you like better.

Which one do you prefer?

- the postcard
- the pen

Willingness to Switch Elicitation: Transcription of video instructions

Thank you for indicating your choice between the pen and the postcard. Whether you get what you chose, or the other item will depend on your answers in the next task. The next task will help us put a monetary value on the strength of your preference between the two options. You've already indicated your strength of preference. Now, we will ask you

Figure 6. Screenshot: Elicitation of preference strength in the practice round

You indicated that you like the postcard more than the pen. Please indicate the strength of your preference for the postcard over the pen below.

(The higher the number, the more you preferred the option you selected over the alternative.)

0 Completely indifferent between the two options	1	2	3	4	5	6	7	8	9	10 Very strong preference for the postcard
○	○	○	○	○	○	○	○	○	○	○

Figure 7. Screenshot: Willingness to switch elicitation in the practice round

You chose the postcard over the pen.

Whether you get the postcard or get the pen will be determined by your choices in the following decisions.

The task below asks you to make 10 decisions, indicating whether you would change your choice from the postcard to the pen in exchange for some monetary compensation at the end of the study. If you change your choice, you would receive the option you liked less (the pen) instead of the option you liked more (the postcard).

If you like the postcard much more than the pen, then you would require a higher payment in order to give the postcard up and settle for the pen. If you don't have a strong preference, then this payment does not have to be very high for you to change your choice. In sum, the more you like the postcard over the pen, the more compensation you should require in order to switch your choice.

Please indicate your choices.

	No	Yes
Q1. For a compensation of 1 cent I would change my choice	○	○
Q2. For a compensation of 5 cents I would change my choice	○	○
Q3. For a compensation of 10 cents I would change my choice	○	○
Q4. For a compensation of 15 cents I would change my choice	○	○
Q5. For a compensation of 20 cents I would change my choice	○	○
Q6. For a compensation of 25 cents I would change my choice	○	○
Q7. For a compensation of 30 cents I would change my choice	○	○
Q8. For a compensation of 35 cents I would change my choice	○	○
Q9. For a compensation of 40 cents I would change my choice	○	○
Q10. For a compensation of 50 cents I would change my choice	○	○

a list of questions that will translate the difference in your liking to how much we would have to compensate you in order to give you the item you did not want to receive. You will see 10 questions, each of which will ask you whether you would change your choice if we compensated you for the amount specified in the question. You will answer by selecting yes or no. The stronger your preference for the item you chose over the item you rejected, the more money we would need to pay you to give you the item you did not want to receive rather than the item you chose. Let's look at what these questions will look like. On your screen, you will see the following list. [screenshot of the list] Question 1 asks whether you would change your choice if we paid you 1 cent to do that. If you say no, you will get the item you preferred to take with you at the end of the study today. If you say yes, you will receive 1 cent and instead get the item you did not prefer. Question 2 increases the compensation to 5 cents and asks if you would switch to that amount. In this manner, questions keep increasing the compensation amount, until Question 10, which offers you 50 cents to change the item you will get at the end of the study. Clearly, you may say No to all the questions if you would need more than 50 cents to be OK with getting the item you rejected. Or you can say yes to all these questions if you don't care much about which item you get. Everyone's preferences are different, so everyone will require different amounts to change their choice. For example, if 15 cents is not enough compensation to give up your choice, but you would be OK with getting your unpreferred item if we paid you 20 cents or more, your answers would look like this. Or instead, if 30 cents is not enough compensation to give up your choice, but you would be OK with getting your unpreferred item if we paid you 35 cents or more, your answer would look like this. There are no right or wrong answers. Please think about how much you like the item you chose versus the item you rejected. This task is designed to elicit your true preferences. As such, we will randomly draw a number between 1 and 10 using the online random number generator. This will determine the question we will carry out. For example, if the number 6 comes up, we will look at Question 6. If you said No to that question, you will keep the item you prefer. If you said Yes, you will let that item go and switch to the other item, and receive the monetary compensation specified in Question 6. You should consider each question independently and indicate your true preferences. If you say No when you would rather take the money, or if you say Yes when you'd rather keep the item you prefer, you may feel regret when we carry out your choice. So please think carefully and answer these questions according to your own preferences. We show you the task one more time before you proceed. Think about what compensation is too little for you to switch your choice, and what compensation would be enough. Accordingly, click Yes or No for each question. Please raise your hand now if you had any technical difficulties in hearing or reading these video instructions. Otherwise, click the next button.

A.2.3. *The Main Experiment.* After completing the practice round, participants were told that they were now moving on to the second task in the study, and were asked to put on their headphones to listen to several video instructions.

Transcription of video instructions

You will participate in a lottery with the raffle ticket you were given. The chances of winning are 50%. If you win the lottery, you will get an additional $10. If you do not win the lottery, you will not get any additional payment. We will determine whether you won or did not win right after these instructions. The experimenter will roll a 10-sided die and cover it with a cup. The die outcome can be 0, 1, 2, 3, 4, 5, 6, 7, 8, or 9, each with equal chance. If the die outcome is even, and your ticket's last digit is even, it means that you have won the lottery. If the die outcome is odd, and your ticket's last digit is odd, it also means that you have won the lottery. Otherwise, it means that you did not win the lottery. So, you have a 50% chance of winning and 50% chance of not winning. Note that the chance of winning and not winning is equal for everyone and does not depend on how many people are in the session. Multiple people in the same session will win the lottery. Whether you win or do not win is entirely determined by your ticket number and the die roll. There is an important detail about how we will reveal the outcome of the die roll. When the experimenter rolls the die, she or he will hide the outcome with a cup placed over the die until the end of the study. The experimenter will know the outcome at that time, but the cup will only be removed at the end of the study. So, you will not learn about the outcome of the die roll until the very end of the study. So, even though you know your ticket number, since you don't know the die roll, you will not know whether you won the lottery, even though it is determined already. At the end of the study, the experimenter will remove the cup and everyone will be able to see the die roll. Even though you will not learn the outcome of the die roll right away, the experimenter will give you a code to enter, in order to let your computers know what the outcome of the die roll was. For example, say that we programmed the survey such that the computer knows that the die roll was 4 if you typed in the code word "mouse", and that the die roll was 5 if you typed in the code word "house". If the die roll is 4, the experimenter will instruct you to enter the code word "mouse". Of course, we will be using different code words in the study. You will not know the number a given code word corresponds to, but the computer will. You will also be asked to enter the last digit of your ticket number. Having both pieces of information, the computer will be able to know immediately whether you won or lost the lottery. Now, let's talk about the study itself. During the first half of the study, we will ask your preference regarding the type of clue you would like to get about whether your ticket won you an additional $10. Remember that the outcome of the lottery is determined at the beginning of the study, but stays hidden from you until the experimenter removes the cup. However, the computer knows if you won, and as a result, it is able to give you additional information. You will choose between two clue-generating options, each of which can provide a different kind of information. Please choose between these two options carefully. After you make your choice and answer a few related questions, the computer will show you the information generated by the option you chose. Once you observe this information, you will sit with it until the end of the study. Please take this into account when making your choice. While everyone will eventually learn whether they won the additional $10 at the end of the study, people may differ in their preferences regarding the type of clue they want to sit with until they learn whether they won. As you are waiting to learn the lottery outcome, you will be sitting with the information you learned. In the meantime, in the second part of this study, we will ask you other questions that are unrelated to the lottery. Please take your time in working on this part. If you finish early, please wait patiently and do not engage in any distracting activities. Even if you finish early, you cannot leave early. At the very end of the study, the experimenter will invite a participant to lift the cup and announce the winning ticket numbers. At that time you will fill out the receipt forms and get paid. Please make sure that you understand the flow of this study. When you are ready, please click next to proceed with the study.

A.2.4. *Introducing the choice between information structures.* The choice between two information structures was first presented in instructional videos. The videos were all structured in the following manner: 1) The two options in the question were presented, and the text indicating the contents of each box in the options were read. 2) For each option, the box from which the ball would be drawn if the participant won the lottery was highlighted, followed by the box from which the ball would be drawn if the participant lost the lottery. 3) The percentage of the instances, a red or a black ball would be drawn from Option 1 was indicated and explained, 4) The meaning (posterior probability of winning or losing) associated with observing a red or a black ball from Option 1 was defined and explained, 5) steps 3 and 4 were repeated for Option 2, 6) Option 1 and Option 2 were displayed next to one another and a summary of the information regarding the likelihood of observing each ball color and the posterior probability of winning associated with each color was included below each option. This final comparison visual is the same graphic as the one that the participants saw when they were making a choice between the two options. The video instructions did not provide any additional information than the information already included on their screens right at the time of making a choice, however, we believe that watching the video instructions before making a choice forced participants to pay more close attention to this information and provided them with more of an understanding of how the posterior probabilities were calculated.

Transcript of instructions common to all treatments

We will now introduce the type of questions you will be asked in this part of the study. Please pay close attention to this video. We will be asking comprehensive questions before the decision task. The question presents two clue-generating options. Option 1 on the left and Option 2 on the right. You will choose one of the options. Each of these options will have two boxes inside, as shown on this slide. However, the options will differ in the content of these boxes. Each box will have a combination of red and black balls. We will give an example of this in the next slide. What are these boxes for? When you choose one of the two options, the computer will draw a ball from the left box if you won the lottery, and then draws a ball from the right box if you did not win the lottery. Remember that the computer knows whether your ticket number is a winning number or not because you entered its last digit and the code that the experimenter supplied. Since the number of red and black balls in each box may differ, the color of the ball that the computer draws from the option you chose can be an informative signal about your chances of winning the lottery. Depending on the content of the boxes, the options can give you further information about the likelihood that you won or did not win the lottery. The option you will choose will differ in the amount and kind of information it can provide. We are interested in how much and what kind of information you would like to get. This question asks you to choose between these two options. Please pay close attention to the contents of the boxes of each option. We will now talk about them in detail.

Transcript of T1 instructions

Let's first look at Option 1. In the left box, there are 100 red balls and 0 black balls. In the right box, there are 0 red and 100 black balls. If you pick Option 1 and you won the lottery, the computer will draw a ball from the left box with 100 red balls. And if you did not win, it will draw a ball from the right box with 100 black balls. Now, let's look at Option 2. In the left box, there are 50 red and 50 black balls. In the right box, there are 50 red and 50 black balls. So, if you pick Option 2 and you won the lottery, the computer will draw a ball from the left box with 50 red and 50 black balls. And if you did not win the lottery, the computer will draw a ball from the right box with 50 red and 50 black balls. For this question, we will ask you to pick between these two clue-generating options. Think about what kind of clue you would like to get about whether you won or not. How do these two options differ in the type of clue they can provide? Let's look into these options one by one. First, let's look at Option 1. You can expect to see a red ball from this option 50% of the time, and a black ball from this option 50% of the time. Why? Remember that the computer is equally likely to draw a ball from either of the boxes because the chances of winning are 50%. So, 50% of the time you will see a red ball, and 50% of the time you will see a black ball. If you see a red ball from Option 1, you learn right away that you won the lottery for sure. This is because red balls can only come from the left box and the computer draws from the left box only if it determines that you have won the lottery. And, if you see a black ball from Option 1, you learn right away that you did not win the lottery for sure. This is because black balls can only come from the right box and the computer draws from the right box only if it determines that you did not win the lottery. We reviewed Option 1. Now, let's look at Option 2. You can expect to see a red ball from Option 2 50% of the time and a black ball 50% of the time. This is because 50% of the time, the computer will draw a ball from the left box with a 50% chance of getting a red ball. The other 50% of the time, the computer will draw a ball from the right box, with a 50% chance of getting a red ball. So, overall you can expect to see a red ball 50% of the time, and a black ball 50% of the time. So, if you see a red ball from Option 2, it means that the chances that you won are 50%. Therefore, observing a red ball from this option gives you no additional information about whether your ticket has already been won. Similarly, if you see a black ball, you also learn that your chances of winning are 50%, giving you no additional information about whether or not you have won the lottery. Now, let's review the two options side by side. In both options, the chances of seeing a red or a black ball are equal to 50%. When you see a ball drawn from Option 1, regardless of its color, you immediately learn whether you have won the lottery or not. Conversely, when you see a ball drawn from Option 2, regardless of its color, you do not learn anything new about whether you have won the lottery. Therefore, a choice between these two options is a choice about when you would like to learn the outcome of a lottery. Option 1 reveals the outcome immediately, and Option 2 does not give you any new information until the end of the study. Please think about which option you would prefer to see a ball drawn from. Remember, you will get this information at the end of part one and you will sit with it, until you learn the outcome of the die roll at the end of the study. Now, please move on to the comprehension and choice questions by clicking the next button when it appears.

Transcript of T2 instructions

Let's first look at Option 1. In the left box, there are 100 red balls and 0 black balls. In the right box, there are 50 red and 50 black balls. If you pick Option 1 and you won the lottery, the computer will draw a ball from the left box with 100 red balls. And if you did not win, it will draw a ball from the right box with 50 red and 50 black balls. Now, let's look at Option 2. In the left box, there are 50 red and 50 black balls. In the right box, there are 0 red and 100 black balls. If you pick Option 2 and you won the lottery, the computer will draw a ball from the left box with 50 red and 50 black balls. And if you did not win, the computer will draw a ball from the right box with 100 black balls. For this question, we will ask you to pick between these two clue-generating options. Think about what kind of clue you would like to get about whether you won or not. How do these two options differ in the type of clue they can provide? Let's look into these options one by one. You can expect to see a red ball from Option 1 75% of the time, and a black ball 25% of the time. This is because 50% of the time, the computer will draw a ball from the right box, getting a black ball 25% of those times. The other 50% of the time, the computer will draw a ball from the left box, never getting a black ball. So, there is a 75% chance of seeing a red ball, and a 25% chance of seeing a black ball. Now, what happens if you see a black ball? If you see a black ball from Option 1, you learn right away that you did not win the lottery. Why? Black balls can only come from the right box, and the computer draws from the right box only if it determines that you did not win the lottery. How about if you see a red ball? Not that the red ball could have come from either the left or the right box. But there are twice as many red balls in the left box than there are in the right box. So, seeing a red ball means that the chances that you have won the lottery is higher than 50%. When we calculate the odds, observing a red ball, means your chances of having won are 67%. We've reviewed Option 1. Now, let's look at Option 2. You can expect to see a red ball from Option 2 25% of the time and a black ball 75% of the time. This is because 50% of the time, the computer will draw a ball from the left box getting a red ball 50% of those times. The other 50% of the time, the computer will draw a ball from the right box, never getting a red ball. So, there is a 25% chance of seeing a red ball, and a 75% chance of seeing a black ball. What happens if you see a red ball? If you see a red ball from Option 2, it means that you have won the lottery. You know this for sure because the only way you can see a red ball, is it if comes from the left box and the computer only draws from that box if you won. How about if you see a black ball? Note that the black ball could have come from either the left or the right box, but there are twice as many black balls in the right box than there are in the left. So, seeing a black ball is a signal that your chances of winning are a bit worse than 50%. When we calculate the odds, we learn that seeing a black ball from Option 2 means that your chances that your ticket won is 33%. Now, let's look at these two options side by side. When Option 1 shows a red ball, which happens 75% of the time, you know that your chances of having won the lottery are 67%. When Option 1 shows a black ball, which happens 25% of the time, you learn for sure that you have lost the lottery. When Option 2 shows a red ball, which happens 25% of the time, you know for sure that you have won the lottery. When Option 2 shows a black ball, which happens 75% of the time, you learn that your chances of having won the lottery are 33%. Therefore, while the chances of getting good news is higher than Option 1, the good news from Option 2 is much stronger. Similarly, while the chances of getting bad news is higher from Option 2, the bad news from Option 1 is much stronger. Please think about which option you would prefer to see a ball drawn from. Remember, you will get this information at the end of part one and you will sit with it, until you learn the outcome of the die roll at the end of the study. Now, please move on to the comprehension and choice questions by clicking the next button when it appears.

A.2.5. *Checks and Ancillary Questions.* [Instruction comprehension questions]: We already determined who won and who did not win the lottery by rolling the die. When will you learn whether you did not win or won? What is your chance of winning the lottery? Can you, another participant or the experimenter influence whether you won or did not win the lottery?

[Attention checks]: (after the ball color is indicated) Given this clue, what are the chances that you won the lottery? (Next page) Please indicate the color of the ball you observed.

[Confusion prompt]: We want to know if there was any part of the study that was confusing. Please think about what instructions or procedures in this study that were confusing and list your confusions/questions below.

[Demographics questionnaire]: Please indicate your age. What is your gender? Please indicate how many experimental studies you participated in at the [blinded for review] Lab in the past. Please indicate how many experimental studies you participated in on the [blinded for review] campus (any lab) in the past. Please choose all departments on campus where you have participated in experiments before.

[Happiness questionnaire]: Please indicate how happy/unhappy you are feeling in the current moment by sliding the scale. -100 means you are feeling 'very unhappy', 100 means you are feeling 'very happy', 0 means you are feeling 'neutral'. After reading the initial instructions presented in D.1., participants were asked to rate their happiness. The same question was repeated after the participants received a signal from the information structure, after the lottery outcome was announced, and after the participants got paid.

A.2.6. *Choice, Preference Strength, and Willingness to Switch.* Figure 8 shows a screenshot of the page participants made a choice on (for T3). Figure 9 shows the question that elicited preference strength after the choice. Figure 10 shows a screenshot of the page participants read the explanation of the willingness to switch elicitation and Figure 11 shows the elicitation. As Figure 12 shows, participants were shown the random question chosen from the willingness to switch elicitation task and were asked a comprehension question about which information structure they would observe a ball from given their choice in that question. Figure 13 shows a screenshot of how the color of the ball drawn from the information structure is communicated and how the posteriors were confirmed.

Filler Task Instructions and Payment. Thank you for your answers. We will now ask you to work on an unrelated study while you sit with the information you received and wait for the outcome of the lottery to be revealed. There are only a few questions in this part. Please take your time answering them in detail. Please think carefully. You have plenty of time to answer these questions. Please do not rush. If you finish early, you will sit and wait for the end of the experiment.

[For about 30 minutes, the participants worked on the filler tasks. They saw the following instructions upon completion of these tasks.]

Thank you. You've reached the end of the study. Please wait patiently for the announcement of the roll die which will determine whether you won or lost the lottery. It is likely that others have not yet finished answering all questions. Please wait silently in your seat. Do not distract others in any way. Do not engage with any electronic devices (e.g., cell phones, iPods,..). Do not browse the web or open any other tab. Do not proceed without further instructions. You will be given a code to proceed once the winning last digits are announced. While waiting, you may fill out the receipt form on your desk as much as you can. Please do not guess how much you earned, we will complete that part last when you get paid in cash.

[The participants were given a passcode to enter once all participants arrived at this page. Therefore, all participants proceeded to the next page at the same time.]

[Instructions on the payment page depended on the die outcome, the last digit of the raffle ticket the participant was holding, and the participants' decisions in the experiment. An example is provided below.]

We rolled a 10-sided die to determine the winning last digits at the beginning of this study. The code you entered in the program told the computer that the die came up even. You indicated that the last digit of your lottery ticket number is 4. You won the lottery. You will get an additional $10.

As a result, your total payment will be the sum of $17 + 0 cents + 10 cents. Please enter the total amount on your receipt form and complete all fields of the form. You are also taking a pen with you.

Explanation: You are getting $7 for participation, $10 from the lottery. In the question concerning the choice between the postcard and the pen, you chose the pen. In Q4, "For compensation of 15 cents I would change my choice," you indicated No. In the question concerning the choice between clue-generating Option 1 and Option 2, you chose option 1. In Q3 "For a compensation of 10 cents I would change my choice." you indicated Yes.

[After the participants were paid in private, they returned back to their computers to fill in the receipt forms and to share final comments about the study if they had any. All sessions ended on time.]

FIGURE 8. Screenshot: Choice page for T3

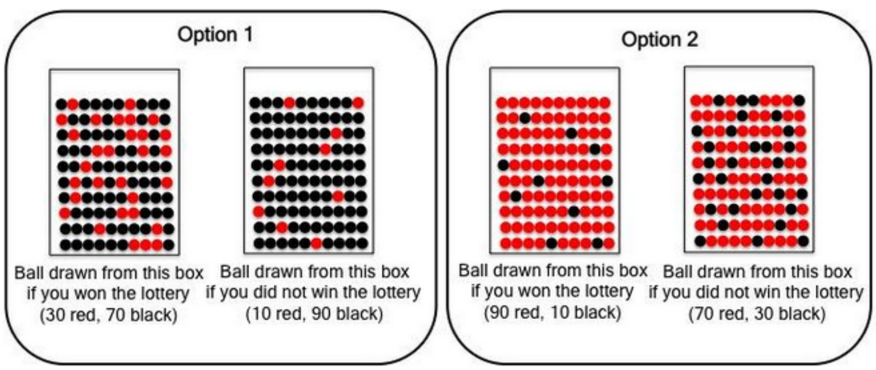
Remember that the chances of winning this lottery is 50%.

When you choose one of the two options below, a ball from a box will be drawn based on the specifications of that option. You will observe the color of the ball immediately. The color of the ball is a clue about the likelihood of you winning the lottery. Different options may present different types of information you can learn about whether you won or not from the color of the drawn ball. The ball draw will be made based on whether you won the lottery or not, which is predetermined earlier in the study.

Option 1: If you won the lottery, a ball will be drawn from a box that contains 30 red and 70 black balls. If you did not win the lottery, a ball will be drawn from a box that contains 10 red and 90 black balls. You will observe the color of the ball only (not which box it comes from). Your chances of observing a red ball is 20%. Your chances of observing a black ball is 80%. If you observe a red ball, it means that your chances of winning the lottery is 75%, which is higher than what you thought it was before. If you observe a black ball, it means that your chances of winning the lottery is 44%, which is lower than what you thought it was before.

Option 2: If you won the lottery, a ball will be drawn from a box that contains 90 red and 10 black balls. If you did not win the lottery, a ball will be drawn from a box that contains 70 red and 30 black balls. You will observe the color of the ball only (not which box it comes from). Your chances of observing a red ball is 80%. Your chances of observing a black ball is 20%. If you observe a red ball, it means that your chances of winning the lottery is 56%, which is higher than what you thought it was before. If you observe a black ball, it means that your chances of winning the lottery is 25%, which is lower than what you thought it was before.

These options are also presented graphically below. People differ in their preferences in this choice. Consider what kind of information you may get from each option. Please pick according to your own preferences. There are no right or wrong answers.



20% red, 80% black
Black: 44% win
Red: 75% win

80% red, 20% black
Black: 25% win
Red: 56% win

Which option do you prefer to see a ball from?

Figure 9. Screenshot: Preference Strength

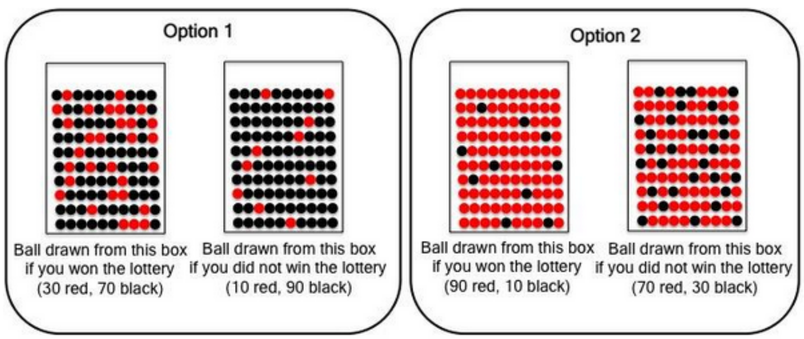
You indicated that you would prefer to see a ball drawn from Option 2 rather than a ball drawn from Option 1. Please indicate the strength of your preference below.

(The higher the number, the more strongly you preferred Option 2 over Option 1.)

0 Completely indifferent between the two options	1	2	3	4	5	6	7	8	9	10 Very strong preference for Option 2
○	○	○	○	○	○	○	○	○	○	○

Figure 10. Screenshot: Preamble to willingness to switch elicitation

You chose Option 1 among the options below.



20% red, 80% black	80% red, 20% black
Black: 44% win	Black: 25% win
Red: 75% win	Red: 56% win

We now offer you the option to change your choice in exchange for some money. In particular, we will ask, if for a given amount, you would be willing to switch you choice to (Option 2), instead of the option you chose (Option 1). If you care about your choice, then you would require a higher payment in order to give it up and settle for the other alternative. If you don't have a strong preference, then this payment does not have to be very high for you to change your choice.

When you are done with answering the 10 questions below, we pick a random number between 1 and 10 to select the question to be carried out. Therefore, please take each question seriously, as they all have the same chance to be selected.

Given this setup, your choices here should truthfully reflect your preferences, such that you have no regrets when we carry out your decision in any of these questions.

FIGURE 11. Screenshot: Willingness to switch elicitation

Please indicate your choices.

Think about how much compensation you would need in order to see a ball that is drawn from the option you did not prefer (Option 2) instead of a ball that is drawn from the option you preferred (Option 1).

	No	Yes
Q1. If you give me 1 cent I would change my choice	○	○
Q2. If you give me 5 cents I would change my choice	○	○
Q3. If you give me 10 cents I would change my choice	○	○
Q4. If you give me 15 cents I would change my choice	○	○
Q5. If you give me 20 cents I would change my choice	○	○
Q6. If you give me 25 cents I would change my choice	○	○
Q7. If you give me 30 cents I would change my choice	○	○
Q8. If you give me 35 cents I would change my choice	○	○
Q9. If you give me 40 cents I would change my choice	○	○
Q10. If you give me 50 cents I would change my choice	○	○

FIGURE 12. Screenshot: Randomly chosen willingness to switch question

You chose Option 1 over Option 2.

The randomly chosen question was:
Q8. If you give me 35 cents I would change my choice.

Your answer was Yes.

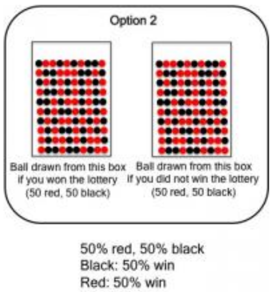
Explanation:
If your answer was "No", you will see a ball drawn from Option 1.
If your answer was "Yes", you will instead see a ball drawn from Option 2 and receive an additional 35 cents at the end of the study as compensation for switching your choice.

As a confirmation that you understand the explanation above, which of the following is correct?

○ I will see a ball drawn from Option 1
○ I will see a ball drawn from Option 2

Figure 13. Screenshot: Observing a signal

According to your choices, on the next page, you will see a random ball drawn according to the specifications of Option 2.



The color of the ball randomly drawn from Option 2 according to whether you won or lost the lottery was:

RED

Given this clue, what are the chances that you won the lottery?

Chance that I won	0	%
Chance that I lost	0	%
Total	0	%

Table 6. Experiment 1: Preference Intensity Distribution

		Preference Strength											Avg.	Difference p-value
		0	1	2	3	4	5	6	7	8	9	10		
Early vs. Late														
T1	$(1,1) \succ (.5,.5)$	0	1	1	2	2	2	4	5	8	7	23	8.05	.016
	$(.5,.5) \succ (1,1)$	0	0	1	1	0	3	5	5	6	2	1	6.71	
Positively Skewed vs. Negatively Skewed														
T2	$(.5,1) \succ (1,.5)$	1	0	2	3	4	4	3	11	16	6	12	7.19	.099
	$(1,.5) \succ (.5,1)$	1	1	0	0	0	2	4	4	3	0	1	6.06	
T3	$(.3,.9) \succ (.9,.3)$	2	2	2	5	2	7	9	14	4	3	6	5.98	.776
	$(.9,.3) \succ (.3,.9)$	2	0	1	0	3	3	5	7	5	1	0	5.81	
T4	$(.6,.9) \succ (.9,.6)$	1	0	3	1	3	5	9	20	10	5	1	6.47	.903
	$(.9,.6) \succ (.6,.9)$	1	0	1	1	0	1	3	6	6	0	1	6.40	
Positively Skewed vs. Late														
T5	$(.5,1) \succ (.5,.5)$	1	0	0	1	0	4	9	8	12	5	25	8.06	.001
	$(.5,.5) \succ (..5,.1)$	1	0	1	0	1	1	1	3	2	0	0	5.40	
T6	$(.3,.9) \succ (.5,.5)$	1	0	2	0	2	2	10	12	8	7	12	7.38	.012
	$(.5,.5) \succ (.3,.9)$	0	2	1	1	0	1	2	3	0	0	2	5.42	
Negatively Skewed vs. Late														
T7	$(1,.5) \succ (.5,.5)$	1	0	2	1	0	3	8	7	3	2	14	7.34	.048
	$(.5,.5) \succ (1,.5)$	1	1	1	1	1	4	0	2	1	1	3	5.69	
T8	$(.9,.3) \succ (.5,.5)$	3	0	1	3	1	5	13	1	8	0	11	6.50	.068
	$(.5,.5) \succ (.9,.3)$	3	0	0	1	1	2	2	3	1	0	1	4.86	
(Symmetric) Gradual vs. Late														
T9	$(.79,.79) \succ (.5,.5)$	2	0	3	0	3	2	5	8	9	6	13	7.25	.184
	$(.5,.5) \succ (.79,.79)$	1	0	0	1	2	0	2	1	3	1	1	6.08	
T10	$(.63,.63) \succ (.5,.5)$	3	1	1	3	2	3	8	6	3	2	12	6.52	.041
	$(.5,.5) \succ (.63,.63)$	2	1	0	2	1	1	3	4	1	0	0	4.67	

The table reports the distribution of preference intensity of participants preferring each option across treatments. It also reports the average preference intensity of each group, and p−values from two-sided t−tests of the null hypothesis that the average preference intensity reported by individuals who chose each option is the same.

Table 7. Experiment 1: Information Premia Distribution

		Minimum Compensation Required to Switch (cents)											Avg. Cond'l Premia.	Difference p-value
		0.1	1.1	5.1	10.1	15.1	20.1	25.1	30.1	35.1	40.1	50.1		
Early vs. Late														
T1	$(1,1) \succ (.5,.5)$	9	5	5	2	2	7	1	1	2	9	12	23.83	.209
	$(.5,.5) \succ (1,1)$	2	1	0	3	0	2	3	0	1	7	5	29.72	
Positively Skewed vs. Negatively Skewed														
T2	$(.5,1) \succ (1,.5)$	6	0	1	1	2	11	2	3	4	18	14	31.79	.070
	$(1,.5) \succ (.5,1)$	4	0	1	0	0	5	1	0	0	1	4	23.22	
T3	$(.3,.9) \succ (.9,.3)$	6	4	5	0	2	20	1	1	0	10	7	22.67	.762
	$(.9,.3) \succ (.3,.9)$	4	1	0	2	1	8	0	1	1	7	2	23.84	
T4	$(.6,.9) \succ (.9,.6)$	7	3	4	0	2	12	3	2	5	10	10	26.01	.724
	$(.9,.6) \succ (.6,.9)$	3	1	1	0	0	5	0	0	1	4	5	27.65	
Positively Skewed vs. Late														
T5	$(.5,1) \succ (.5,.5)$	5	6	2	1	0	5	7	2	2	8	27	32.42	.625
	$(.5,.5) \succ (.5,.1)$	1	1	1	0	0	1	1	0	0	1	4	29.20	
T6	$(.3,.9) \succ (.5,.5)$	8	5	0	2	1	18	0	1	5	8	8	23.76	.858
	$(.5,.5) \succ (.3,.9)$	1	2	1	0	1	2	0	0	2	1	2	22.77	
Negatively Skewed vs. Late														
T7	$(1,.5) \succ (.5,.5)$	4	5	2	1	1	6	1	0	0	14	7	26.81	.782
	$(.5,.5) \succ (1,.5)$	0	2	2	0	1	2	1	0	0	4	4	28.35	
T8	$(.9,.3) \succ (.5,.5)$	10	5	6	2	0	10	1	1	2	5	4	17.06	.258
	$(.5,.5) \succ (.9,.3)$	5	0	0	1	0	1	0	0	1	4	2	23.31	
(Symmetric) Gradual vs. Late														
T9	$(.79,.79) \succ (.5,.5)$	5	2	2	2	2	15	2	1	2	8	10	26.22	.959
	$(.5,.5) \succ (.79,.79)$	1	0	0	2	0	5	0	0	0	1	3	25.93	
T10	$(.63,.63) \succ (.5,.5)$	7	4	2	2	3	7	0	0	2	9	8	23.94	.142
	$(.5,.5) \succ (.63,.63)$	1	2	4	1	0	3	0	1	1	2	0	15.90	

The table reports the distribution of the minimum compensation required to switch reported by participants preferring each option. It also reports the average conditional information premia by choice, and p−values from two-sided t−tests of the null hypothesis that the average conditional premium is the same across individuals who made different choices within a treatment.

Appendix B. Experiment 2

B.1. **Protocol Details.** The protocol of this experiment was identical to that of Experiment 1 except this experiment 1) did not include Study 1, 2) presented five binary comparisons of information structures to each participant, 3) did not elicit willingness to switch, and 4) asked a broader set of hypothetical filler questions. We only detail the protocol associated with these differences. B.2.1 details the initial instructions participants received. The participants listened to video instructions (as detailed in B.2.2) introducing the setup of the experiment, and informing participants that they would be making five choices, and one choice would be chosen at random to be carried out. This information was repeated in written instructions that followed, as detailed in B.2.3. Before each decision task, participants listened to video instructions that presented the options in the question. The transcription of the instructions for Q2 is included as an example in B.2.4. After participants answered all five questions, one question was randomly chosen for each participant to be carried out and the program randomly drew a ball from the option the participant chose in that question and displayed it to the participant.

In the remaining time before the outcome of the lottery was to be revealed, participants were asked a series of hypothetical questions across 5 blocks. Each block featured 10 questions, asking whether individuals preferred to take Option A or Option B. In blocks 1-3, Option B was receiving some amount of money for sure, beginning with \$2 and increasing in \$2 increments to \$20 dollars. In block 1, Option A was a gamble that was structured as follows: "a ball will be drawn from a box with 50 white and 50 blue balls. If a blue ball is drawn you receive \$30, otherwise nothing." In block 2, Option A was a gamble that was structured as follows: "a ball will be drawn from a box with white and blue balls (the respective number were not specified). If a blue ball is drawn you receive \$30, otherwise nothing." Option B was receiving some amount of money for sure, beginning with \$2 and increasing in \$2 increments to \$20 dollars. In block 3, Option A was a gamble that was structured as follows: "a ticket will be drawn from an urn that features 101 tickets labeled from 0 to 100. The number on the ticket determines how many blue balls will be in a box of 100 blue and white balls. Next, a ball will be drawn from the box. If a blue ball is drawn you receive \$30, otherwise nothing." In block 4, Option A allowed the individual to receive \$30 for sure. Option B was a gamble that paid an 80% of x and a 20% of 0, where x varied from \$34 to \$74 in \$4 increments. In block 5, Option A was a gamble which allowed the individual to receive a 25% chance of \$30 and 75 % chance of \$0. Option B was a gamble that paid a 20% of x and a 80% of 0, where x varied from \$34 to \$74 in \$4 increments.

B.2. **Experimental Materials.**

B.2.1. *General Instructions.* [The beginning of these instructions are identical to that of Experiment 1.]

This study will take 75 minutes and has two parts. You will receive \$7 for your participation. If you fail to follow the instructions or disturb the flow of the study in any way, you will be asked to leave the study. In addition to the \$7 for participation, you may also win an additional $10 in the lottery we will conduct. The chances of winning are 50% and whether you win $10 will be determined by the ticket number you have.

[The rest of these instructions are identical to that of Experiment 1.]

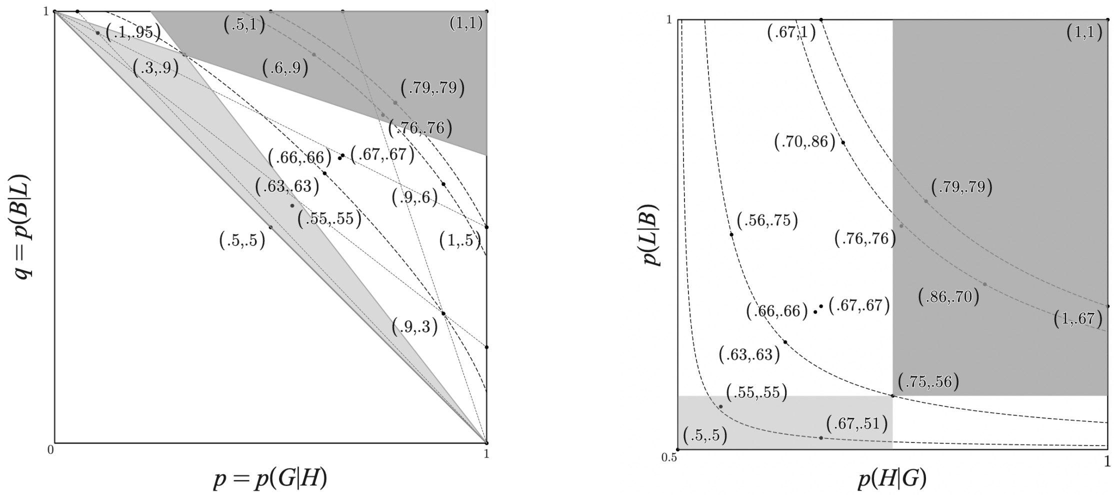
B.2.2. *Lottery and Information: Transcription of video instructions.* [The beginning of these instructions are identical to that of Experiment 1.]

Now, let's talk about the study itself. During the first half of the study, we will ask your preferences about what kind of clues you would like to get about whether your ticket won or lost. Remember, the outcome of the lottery is determined at the beginning of the study, but stays hidden from you until the experimenter removes the cup. However, the computer whether you won or lost, and as a result, it is able to give you signals about the outcome. These signals will come from your choice of clue generating options. You will make five decisions across five different questions, each presenting two clue generating options. Each of the clue generating options has the potential to provide signals about whether you won or lost. The amount and the type of information will differ across these options. We are interested in learning about your preferences regarding different types of clue generating options. Before each decision, you will watch an instructional video that explains each of the clue generating options. It is very important that you pay attention to these videos. At the moment you started the study, the computer picked one question at random among the 5 questions you will answer. Each question has equal chance of being picked. Your decision in the question that is picked at random will be carried out at the end of Part 1. In other words, at the end of Part 1, you will observe a signal generated by the option you chose in that question. This is done in order to make sure that you answer each of the 5 questions as if it were the only question being asked. So please pay attention to each question. One will be carried out to give you the type of clue you prefer about whether you won or lost. Once you observe a clue according to your choice in the chosen question, you will sit with that clue until the end of the study. Please take this into account when making your choices. While everyone will eventually learn the winning lottery numbers at the end of the study, people may differ in their preferences regarding the type of clue they want to sit with until they learn the winning ticket numbers. As you are waiting to learn the winning ticket numbers, we will ask you other questions that are unrelated to the lottery in the Second Part of the Study. Please take your time in answering all questions carefully. Finishing early does not mean you get to leave. Please wait patiently and do not engage in any other activity such as using your phone, web browsing, etc. Please also make sure not to make any distracting noises At the very end of the study, the experimenter will invite a participant to lift the cup hiding the die roll outcome and announce the winning ticket numbers. At that time you will fill out the receipt forms and get paid.

B.2.3. *Introduction to Information Structure Choices.* In the first half of the study, there will be 5 questions, each asking you to choose 1 out of 2 options that generate different clues about your chances of having won the lottery. Some options can give you further information about the likelihood that you won or lost the lottery. Some options do not give any additional information at this time. Some options give more information than others.

And importantly, all these options differ in the kind of information you can get. Please pay close attention to the instructional videos and the options descriptions to make sure you understand these differences before you make a choice. At the end of Part 1, we will ask you to provide a brief description of why you made each choice, so please consider the options carefully, remembering that each option can provide different amounts and types of information. The computer randomly picked a question among these 5 questions at the time you started the survey. Your choice in that question will be honored and you will get the clue you expressed a preference for. You will sit with the information you gained (if you gained any) for the rest of the experiment. Until you are done answering all questions, you will not know which question is picked. The chances of each question being picked are the same. Therefore, please treat each question as if that is the only question being asked. These questions are independent of one another. Only one is selected randomly, and you will receive information based on your preferred option. Now, please make sure that you have your headphones on. You will be asked to keep them on until you are done with the first half of the study.

B.2.4. *Introducing Q2: Transcription of video instructions.* We want to overview some of the general points at this time. Remember that regardless of which Option you pick, the computer draws a ball from the left box in that option if you won the lottery, and it draws a ball from the right box if you lost the lottery. Before you see the color of the ball drawn from an option, you know that the overall chances of winning are 50%. If your ticket number is an odd number and die roll is also an odd number: you win Also, if your ticket number is an even number and die roll is also an even number: you win Otherwise: you lose. So there is an equal chance of that you won or lost the lottery. Remember that the computer knows whether you won or lost, and, the color of the ball the computer draws from an option may give you more information. Also, another common feature you may have already realized in the first Question, is that across all the questions, seeing a red ball means that your chances of having won are either equal to or higher than 50%, and seeing a black ball means that your chances are either equal to or lower than 50%. How much your expectations of having won changes after you see a red or a black ball depends on the contents of the boxes. Now, let's move onto Question 2 and examine the options it presents. Now, we will review Question 2. Question 2 asks you to choose between these two options. These options are quite different than the simpler options you saw in Question 1. So, take a moment to inspect them carefully. If you pick Option 1 and you won the lottery, the computer draws a ball from the box with 50 red and 50 black balls, and if you lost the lottery, it draws a ball from the box with 100 black balls. If you pick Option 2 and you won the lottery, the computer draws a ball from the box with 100 red balls; and if you lost, it draws a ball from the box with 50 red and 50 black balls. How do these two options differ in the type of information they can provide about whether you won or lost the lottery? Let's look into Option 1 first. [Description of option 1 is identical to that of the main experiment, and is omitted here for brevity.] Now, let's look at Option 2. [Description of option 2 is identical to that of the main experiment, and is omitted here for brevity.] Question 2 asks you to choose between these two options. These options are quite different than the simpler options you saw in Question 1. So, take a moment to inspect them carefully. In Option 1 you are more likely to see a black ball and



(A) Blackwell Experiment

(B) Posterior Space

FIGURE 14. Examples of Information Structures used in Experiment 2

in Option 2 you are more likely to see a red ball. In Option 1, Seeing a black ball means that your chances of winning are 33%. Seeing a red ball means that you won for sure. In comparison, in Option 2, seeing a black ball means that you lost for sure and seeing a red ball means that your chances of winning are 67%. Please take a moment to think about the kind of information these options offer and what kind of information you would like to get about your chances of winning. Remember you will get this information at the end of Part 1, sit with it and learn the outcome of die roll at the end of the study. Now, please move on to the comprehension and choice questions by clicking the next button when it appears.

B.3. **Blackwell Ranked Information Structures.** In Experiment 2, participants who preferred early resolution in Q1 were asked Q4a which presented a choice between a positively skewed signal and a symmetric signal that was Blackwell more informative than it. Participants who preferred late resolution in Q1 were asked Q4b, which presented a choice between a positively skewed signal and a symmetric signal that was Blackwell less informative than it. Blackwell's ranking of information structures is incomplete — there are many structures that are neither (strictly) more or (strictly) less informative than a given other. The left panel in Figure 14A provides an illustrative example, indicating the set of information structures that are ranked higher (lower) in terms of their Blackwell informativeness with respect to the information structure $(.3, .9)$ with the darker (lighter) shaded area. Notice that Q4a of Experiment 2, we asked half the individuals who chose $(1, 1)$ in Q1 to evaluate $(.3, .9)$ vs. $(.76, .76)$ – a symmetric structure that is included in the more Blackwell informative set. In Q4b, we asked half the individuals who chose $(.5, .5)$ in Q1 to evaluate $(.3, .9)$ vs. $(.55, .55)$ – a symmetric structure that is included in the less Blackwell informative set. Figure 14B illustrates the corresponding Blackwell more (less) informative sets with dark (light) shading in posterior space, where the Blackwell experiment (.9,.3) is equivalent to the point (.56,.75) in posteriors.

B.4. **Additional Tables.** Table 8 lists the questions asked to each participant in condition 1 and in condition 2. Each session had an equal probability of being assigned to one of the conditions. Overall, 119 successfully completed Condition 1 and 131 individuals successfully completed Condition 2.[30] Note that in Condition 1, individuals saw $[(.9,.3)(.3,.9)]$ as Q3 and saw either $[(.9,.6)(.6,.9)]$ or $[(.55,.55)(.5,.5)]$ as Q5; whereas in Condition 2, they saw $[(.6,.9)(.9,.6)]$ as Q3 and saw either $[(.9,.3)(.3,.9)]$ or $[(.5,.5)(.55,.55)]$ as Q5. Table 9 reports choice frequencies by condition for pairwise comparisons asked as Q3 and Q5. We see that neither the sequence of questions nor the order of information structures within a presented pair made a significant difference in choice frequencies.

Table 8. The order of questions and options across treatments in Condition 1 and 2 of Experiment 2

	Condition 1		Condition 2		
	Option 1	Option 2	Option 1	Option 2	conditional on
Q1	$(1,1)$	$(.5,.5)$	$(.5,.5)$	$(1,1)$	-
Q2	$(1,.5)$	$(.5,1)$	$(.5,1)$	$(1,.5)$	-
Q3	$(.9,.3)$	$(.3,.9)$	$(.6,.9)$	$(.9,.6)$	-
Q4	$(.76,.76)$	$(.3,.9)$	$(.67,.67)$	$(.1,.95)$	if $(1,1) \succeq (.5,.5)$
	$(.55,.55)$	$(.3,.9)$	$(.66,.66)$	$(.5,1)$	if $(1,1) \preceq (.5.5)$
Q5	$(.9,.6)$	$(.6,.9)$	$(.9,.3)$	$(.3,.9)$	random
	$(.55,.55)$	$(.5,.5)$	$(.5,.5)$	$(.55,.55)$	random

Table 9. Experiment 2 – Choice frequencies by sequence of evaluation

	Condition 1		Difference	Condition 2	
	N	Percentage	p-value	Percentage	N
$(.3,.9) \succ (.9,.3)$	119	84%	.215	77%	64
$(.6,.9) \succ (.9,.6)$	65	72%	.795	74%	131
$(.55,.55) \succ (.5,.5)$	54	78%	.557	73%	67

The table reports the ordering of choice options in each treatment across the two conditions, the choice frequencies of option 1, and p–values from χ^2 tests that evaluate the difference in choice frequencies of the same option.

[30] A total of 262 individuals participated in the experiment. Due to a Qualtrics server issue, participants had trouble viewing the images during one of the sessions (9 participants). In addition, 2 participants had other technical issues and 1 participant failed to complete the study in full. Excluding observations from these 12 participants leaves us with the study sample of 250.

Table 10. Experiment 2 Results – Preference Strength Distribution

	Preference Strength												
	Distribution											Avg.	Difference p-value
	0	1	2	3	4	5	6	7	8	9	10		
Early vs. Late													
$(1,1) \succ (.5,.5)$	0	0	3	4	1	7	12	26	47	18	78	8.31	.000
$(.5,.5) \succ (1,1)$	2	1	3	3	3	2	10	11	8	5	6	6.37	
Positively Skewed vs. Negatively Skewed													
$(.5,1) \succ (1,.5)$	3	1	4	2	6	13	31	21	34	21	31	7.23	.001
$(1,.5) \succ (.5,1)$	6	2	0	3	3	11	17	15	12	7	7	6.19	
$(.3,.9) \succ (.9,.3)$	2	3	2	7	8	16	29	34	27	4	17	6.54	.099
$(.9,.3) \succ (.3,.9)$	4	0	2	2	1	4	6	3	6	2	4	5.79	
$(.6,.9) \succ (.9,.6)$	1	5	8	12	7	12	31	25	21	11	11	6.13	.101
$(.9,.6) \succ (.6,.9)$	5	1	0	5	1	11	9	11	4	3	2	5.48	
Positively Skewed vs. Symmetric													
$(.76,.76) \succ (.3,.9)$	4	1	1	2	3	11	11	7	10	4	11	6.42	.403
$(.3,.9) \succ (.76,.76)$	0	1	1	1	2	1	4	3	8	1	5	6.93	
$(.67,.67) \succ (.1,.95)$	3	2	1	2	5	7	5	11	14	7	10	6.67	.453
$(.1,.95) \succ (.67,.67)$	2	1	1	4	3	1	5	6	4	5	5	6.24	
$(.55,.55) \succ (.3,.9)$	0	0	0	0	0	0	2	3	3	0	1	7.44	.203
$(.3,.9) \succ (.55,.55)$	1	0	2	1	1	1	2	4	2	2	2	6.11	
$(.66,.66) \succ (.5,1)$	0	0	0	2	0	2	3	2	2	1	3	6.87	.153
$(.5,1) \succ (.66,.66)$	0	1	0	1	1	2	3	1	3	0	0	5.58	
(Symmetric) Gradual vs. Late													
$(.55,.55) \succ (.5,.5)$	2	8	3	6	3	16	10	9	13	8	13	6.08	.027
$(.5,.5) \succ (.55,.55)$	7	2	0	0	1	6	5	4	1	2	2	4.67	

The table reports the distribution of preference intensity of participants preferring each option across treatments. It also reports the average preference intensity of each group, and p-values from two-sided t-tests of the null that the average preference intensity reported by individuals who chose each option is the same.

Table 11. Relationships: Skewness Preferences

		Pos.	Neg.			Pos.	Neg.			Pos.	Neg.	
		(.5,1)	(1,.5)			(.6,.9)	(.9,.6)			(.6,.9)	(.9,.6)	
Pos.	(.3, .9)	107	42	149	(.3, .9)	85	22	107	(.5, 1)	101	26	127
Neg.	(.9,.3)	17	17	34	(.9,.3)	9	13	22	(1, .5)	43	26	69
		124	59	183		94	35	129		144	52	196
a	68%, p=.000				76%, p=.000				65%, p=.000			
b	β = .94, p = .016				β = 1.72, p = .001				β = .85, p = .010			

The table reports frequencies of participants' choices in the questions that present positively and negatively skewed information structures. In the row denoted by a, the table reports the proportion of choices congruent across the pair of questions and the p-value from a one-sided binomial test of the alternative hypothesis that the proportion of consistency is larger than 50%. In the row denoted by b, the table reports the coefficient from a logistic regression of the choice in one question on the choice in the other and the associated p-value.

Table 11 cross-tabulates within-person choice patterns in the questions that present positively and negatively skewed information structures. Participants who prefer one positively skewed signal are very likely to prefer another positively skewed signal.

Appendix C. Experiment 3

Prior work examining preferences for early versus late resolution has noted the sensitivity of intrinsic informational preferences to priors.[31] To provide a richer set of results and a robustness check, and to shed additional light on theoretical concerns, we present results from a third lab experiment with 232 participants that explores how intrinsic information preference changes when priors vary.

The protocol of this experiment was identical to that of Experiment 1 except in this experiment 1) sessions were conducted both at the University of Michigan, and at the University of Massachusetts, and 2) the probability of winning the lottery was either 10% or 90%, assigned at the session level.[32] A total of 123 participants from the University of Michigan and 109 participants from the University of Massachusetts participated in this experiment in the Winter semester of 2017.

Table 12 lists the three treatments Experiment 3 presents to participants under each prior. C1 presents a choice between full early and full late resolution of uncertainty. C2 and C3 present a choice between positively and negatively skewed information structures. Note that if a treatment offers a choice between a positively skewed option (x_1, y_1) and a negatively skewed option (x_2, y_2) when $f = .1$, it offers a choice between a negatively skewed option (y_1, x_1) and a positively skewed option (y_2, x_2) when $f = .9$. This design ensures that the variances induced by the structures across priors are equal; therefore, preferences for skewness can be compared across priors without confounds arising from differences in informativeness.

In addition, information pairs (p, q) and (p', q') in C2 and C3 are chosen such that, as in Experiments 1 and 2, $p > q$, $q' > p'$, $mean(p, q) = mean(p', q')$, $var(p, q) = var(p', q')$, and $skew(p, q) = -skew(p', q')$. Unlike in Experiments 1 and 2, because the prior is not symmetric, pairs with the same absolute degree of skewness are not reflections of one another across the diagonal in the (p, q) space. Also, the the fact that we want the structures to be equivariant and have the same absolute skewness constrains the set of potential structure pairs. If structures have p or q values that are too close to 1, we cannot find a matching structure that has the same absolute skewness but the opposite sign.

Table 13 summarizes choice percentages across the three treatments (C1, C2, C3) under $f = .1$ and $f = .9$.[33] Treatment C1 presents a choice between full early and full late resolution of uncertainty. Treatments C2 and C3 present a choice between positively and

[31] Chew and Ho [1994] and Arai [1997] find that the preference for early resolution over late resolution grows as the prior for the desired outcome increases, while Ahlbrecht and Weber [1997], Lovallo and Kahneman [2000] and Falk and Zimmermann [2016] find mixed or no evidence for the effect of priors.

[32] A prior of 10% (90%) probability of winning was induced by telling participants that they would win the lottery if the last digit of their ticket matched (did not match) the 10-sided die outcome.

[33] Our results across the 10% and 90% conditions are comparable because the corresponding information structures have the same variance and absolute skewness. However, the variance of posterior distributions is much higher when the prior is 50%. Thus, we hesitate to directly compare the results from this experiment with those from our previous experiments. That said, the information preferences under the 50% prior falls directly between the preferences we found with the 10% and 90% priors.

TABLE 12. The order of options within each pairwise comparison presented by Experiment 3

	Question	
	option 1	option 2
Prior 10%		
C1	$(1, 1)$	$(.5, .5)$
C2	$(.5, .69)$	$(.84, .35)$
C3	$(.94, .21)$	$(.34, .82)$
Prior 90%		
C1	$(1, 1)$	$(.5, .5)$
C2	$(.69, .5)$	$(.35, .84)$
C3	$(.21, .94)$	$(.82, .34)$

negatively skewed information structures. These information structures are equivariant; therefore, preferences for skewness can be compared across priors without confounds arising from differences in informativeness.

The results in Table 13 show that the majority of individuals prefer positively skewed signals to negatively skewed signals and full early resolution to full late resolution of uncertainty. However, the prevalence of different preferences varies across the two extreme priors. First, more individuals indicate that they prefer to learn the outcome of the lottery earlier when the ex-ante probability of winning the lottery is 90% than when the prior is 10%. This result suggests that information avoidance is more severe when the probability of the undesired outcome looms large. Second, the preference for positively skewed information is held by more participants when the ex-ante probability of winning the lottery is 90%. As Table 14 shows, choice percentages are not statistically different across the two campuses. These results suggest that in most cases, individuals have a stronger preference to preserve hope when hope is initially high, although we emphasize that a more detailed study is needed to understand the mechanism for these results.

Table 15 reports the distribution of preference strength and Table 16 reports the distribution of minimum compensation required to switch among individuals who chose each option. We see that the levels are similar to the those documented in Experiment 1, and the preferences are stronger for the chosen option among the individuals who choose the fully revealing signal and the positively skewed signals.

TABLE 13. Results from Experiment 3

	Prior 10%						*Prior 90%*			
	N	Preferences	Pct.	p-value	Diff.	p-value	p-value	Pct.	Preferences	N
C1	35	$(1,1) \succ (.5,.5)$	63%	.175	27%	.007	.000	89%	$(.5,.5) \prec (1,1)$	38
C2	40	$(.5,.69) \succ (.84,.35)$	65%	.081	24%	.014	.000	89%	$(.69,.5) \prec (.35,.84)$	36
C3	42	$(.34,.82) \succ (.94,.21)$	69%	.020	16%	.077	.000	85%	$(.82,.34) \prec (.21,.94)$	41

On the leftmost panel, the table reports the total number of participants who participated in each treatment (N) when prior=.1, the percentage of participants who indicated a preference for the first option in the preference ordering listed, and the $p-$values from two-sided binomial tests against the null hypothesis of random choice. On the rightmost panel, the table reports the same statistics for each treatment when prior= .9. In the middle panel, the table reports the magnitude of the difference in choice percentages and the $p-$values from χ^2 tests evaluating the significance of this difference.

TABLE 14. Experiment 3 – Choice frequencies across two campuses

		U of M		Difference	U Mass	
		N	Percentage	p-value	Percentage	N
Prior 10%						
C1	$(1,1) \succ (.5,.5)$	17	76%	.105	50%	18
C2	$(.5,.69) \succ (.84,.35)$	20	65%	1.000	65%	20
C3	$(.34,.82) \succ (.94,.21)$	22	68%	.899	70%	20
Prior 90%						
C1	$(1,1) \succ (.5,.5)$	22	95%	.159	81%	16
C2	$(.35,.84) \succ (.69,.5)$	21	86%	.473	93%	15
C3	$(.21,.94) \succ (.82,.34)$	21	90%	.343	80%	20

The table reports choice frequencies broken down by participant population, and p-values from two-sided chi-square tests assessing the difference in choice proportions across the two campuses.

TABLE 15. Experiment 3 Results – Preference Strength Distributions

		Preference Strength Distribution											Avg.	Difference p-value
		0	1	2	3	4	5	6	7	8	9	10		
Prior 10%														
C1	$(1,1) \succ (.5,.5)$	0	0	0	1	1	4	2	2	3	1	8	7.55	.009
	$(.5,.5) \succ (1,1)$	2	0	1	2	0	2	2	1	1	1	1	4.92	
C2	$(.5,.69) \succ (.84,.35)$	1	1	1	1	1	5	4	5	4	1	2	5.96	.544
	$(.84,.35) \succ (.5,.69)$	0	1	2	2	0	2	1	1	4	0	1	5.43	
C3	$(.34,.82) \succ (.94,.21)$	2	0	1	2	0	3	10	3	5	0	3	6.00	.202
	$(.94,.21) \succ (.34,.82)$	1	1	1	2	0	2	3	0	2	0	1	4.85	
Prior 90%														
C1	$(1,1) \succ (.5,.5)$	0	0	2	0	0	1	1	6	9	0	15	8.21	.000
	$(.5,.5) \succ (1,1)$	2	1	0	0	1	0	0	0	0	0	0	1.25	
C2	$(.35,.84) \succ (.69,.5)$	0	1	0	1	2	4	10	6	1	4	3	6.50	.018
	$(.69,.5) \succ (.35,.84)$	0	0	2	0	1	0	0	1	0	0	0	3.75	
C3	$(.21,.94) \succ (.82,.34)$	2	1	2	0	0	5	8	6	9	0	2	6.06	.079
	$(.82,.34) \succ (.21,.94)$	1	1	0	1	0	1	0	1	1	0	0	4.00	

The table reports the distribution of preference intensity of participants preferring each option across treatments. It also reports the average preference intensity of each group, and p-values from two-sided t-tests of the null that the average preference intensity of the two groups are the same.

Table 16. Experiment 3 Results – MCTS Distributions

		MCS												
		Distribution											Avg.	Difference p-value
		0.1	1.1	5.1	10.1	15.1	20.1	25.1	30.1	35.1	40.1	50.1		
Prior 10%														
C1	$(1,1) \succ (.5,.5)$	2	2	0	0	0	5	1	0	2	7	3	28.60	.394
	$(.5,.5) \succ (1,1)$	4	1	1	0	0	1	0	0	0	3	3	22.87	
C2	$(.5,.69) \succ (.84,.35)$	6	2	1	0	0	7	0	2	1	4	3	21.33	.807
	$(.84,.35) \succ (.5,.69)$	2	2	1	0	0	5	0	0	0	3	1	19.89	
C3	$(.34,.82) \succ (.94,.21)$	5	3	0	1	2	7	0	2	0	7	2	21.58	.931
	$(.94,.21) \succ (.34,.82)$	3	1	0	1	1	2	0	0	0	3	2	22.10	
Prior 90%														
C1	$(1,1) \succ (.5,.5)$	8	1	2	1	1	3	2	1	2	7	6	24.39	.368
	$(.5,.5) \succ (1,1)$	2	0	0	0	0	1	0	0	0	1	0	15.10	
C2	$(.35,.84) \succ (.69,.5)$	3	1	5	0	2	6	1	1	1	10	2	24.04	.682
	$(.69,.5) \succ (.35,.84)$	0	1	1	0	0	0	0	0	1	1	0	20.35	
C3	$(.21,.94) \succ (.82,.34)$	4	0	2	1	2	8	0	1	3	8	6	27.67	.159
	$(.82,.34) \succ (.21,.94)$	3	0	0	0	0	1	0	0	0	2	0	16.77	

The table reports the distribution of the MCTS reported by participants preferring each option. It also reports the average MCTS of each group, and p-values from two-sided t-tests of the null that the average MCTS of the two groups are the same.

Appendix D. Alzheimer's Disease Survey

This short survey was fielded on the Prolific and Amazon MTurk platforms during the Fall 2020, among a sample of individuals who listed English as their first language and were older than 40 years. A total of 626 participants successfully completed the survey. Initially, 828 respondents started the study, 124 did not complete the first page of the study which included the first attention check, 4 failed the initial attention check asking them to type in 10, 17 did not complete the study and 69 failed the attention check about number of APOE's. Participants who passed the comprehension checks were paid $0.75 for their participation. The University of Michigan Institutional Review Board Health Sciences and Behavioral Sciences has determined that this study is exempt from IRB oversight (HUM00148129). Among the 626 respondents, 55% of them are female. The average age is 53 and the average expected age of death is 82.

Consent Form Welcome to this very short survey. This is a 5 minute long survey that will ask about your demographics, expectations, preferences. Please pay attention to all instructions / details.

Benefits of the research to the public stem from your participation and honest answers. the purpose of this study is to design better information tools regarding life expectancy and health. We do not foresee any risks or discomforts of participating in this survey.

Participating in this study is completely voluntary. Even if you decide to participate now, you may change your mind and stop at any time. You may choose not to continue with the survey at any time and for any reason.

We will include attention checks. Failure to give the correct answer will lead to the termination of the study without payment. Duplicate attempts are not allowed and will not receive payment.

We will protect the confidentiality of your research records by not publishing any information that may identify you. Information collected in this project may be shared with other researchers. We will not share any information that could identify you. All results will be reported in aggregate.

Investigator: Yesim Orhun, Associate Professor, University of Michigan. If you have questions about this research study, please contact the researchers by emailing aorhun@umich.edu. The University of Michigan Institutional Review Board Health Sciences and Behavioral Sciences has determined that this study is exempt from IRB oversight (HUM00148129).

By clicking to proceed, you are confirming that you read this page and are providing consent to participate.

– *Page Break* –

Front end.

- What is your gender? [Male, Female]
- What is your current age? [open-ended numerical answer]
- What is your best guess of the age until which you will survive? [open-ended numerical answer]
- It is important that you pay attention to this study. Please enter ten in numerical form. [study terminated if the answer was not 10]

– Page Break –

Instructions and introduction of Alzheimer's disease.

(Please read carefully to answer the attention check question in the next page) Alzheimer's disease is a progressive mental and physical deterioration that can occur in middle age or old age, due to degeneration of the brain. Unfortunately, the health of the patient and his/her quality of life degenerates progressively. There is no known cure for the disease.

Early diagnosis can give patients access to treatment options, a chance to prioritize their health, more time to plan for the future and end-of-life plans, and a chance to save on the cost of medical and long-term care.

Currently, several genetic tests are available to test for a person's risk of developing late-onset of Alzheimer's Disease. These tests can inform you of your APOE gene variant. APOE is associated with varying risk of developing Alzheimer's, and there are three possible types: neutral, protective, risky.

– Page Break –

- How many APOE gene variants are there? [2,3,4. If 3 was not chosen, the study was terminated]

– Page Break –

Base rate information. Those who passed the attention check went on to read the following content:

Yes, there are three APOE variants. (Please also read the following carefully). APOE3, found in about 70% of the population, is the most common variant and is considered neutral. The protective type, APOE2 is the rarest form, found in 5-10% of people, and is associated with reduced risk of Alzheimer's. The risky type, APOE4, found in 10-15% of the population, is associated with a greater risk of getting the disease. Everyone has two copies of the APOE gene: people with APOE2/APOE2 have the lowest overall risk for Alzheimer's and those with APOE4/APOE4 have the highest risk. The other combinations of APOE – APOE2/APOE3, APOE2/APOE4, APOE3/APOE3 and APOE3/APOE4 – fall in between.

– Page Break –

Elicitation of Preferences and willingness to pay. The study proceeded with:

- If we gave you the option to send in a saliva sample to be tested...
  - Would you like to learn if you carried at least one copy of the risky type of the gene that is associated with a higher risk of developing the disease? [Yes/No]
  - Would you like to learn if you carried at least one copy of the protective type of the gene that is associated with a lower risk of developing the disease? [Yes/No]
  - Would you like to learn the exact combination of the type of APOE genes you carry? [Yes/No]

– Page Break –

- Please indicate when, if at all, you would be willing to take a test that can identify whether you have at least one copy of the risky type of gene (heightens the risk of Alzheimer's disease). [Participants indicated Yes/No for the following options: Researchers pay you $50, Researchers pay you $25, Researchers pay you $15, Researchers pay you $10, Researchers pay you $5, Test is free to you, You pay $5 to learn, You pay $10 to learn, You pay $15 to learn, You pay $25 to learn, You pay $50 to learn.]

– Page Break –

- Please indicate when, if at all, you would be willing to take a test that can identify whether you have at least one copy of the protective type of gene (lowers the risk of Alzheimer's disease). [Participants indicated Yes/No for the following options: Researchers pay you $50, Researchers pay you $25, Researchers pay you $15, Researchers pay you $10, Researchers pay you $5, Test is free to you, You pay $5 to learn, You pay $10 to learn, You pay $15 to learn, You pay $25 to learn, You pay $50 to learn.]

– Page Break –

- Please indicate when, if at all, you would be willing to take a test that can identify the exact combination of the type of APOE genes you carry. [Participants indicated Yes/No for the following options: Researchers pay you $50, Researchers pay you $25, Researchers pay you $15, Researchers pay you $10, Researchers pay you $5, Test is free to you, You pay $5 to learn, You pay $10 to learn, You pay $15 to learn, You pay $25 to learn, You pay $50 to learn.]

Priors and final questions. The study also asked:

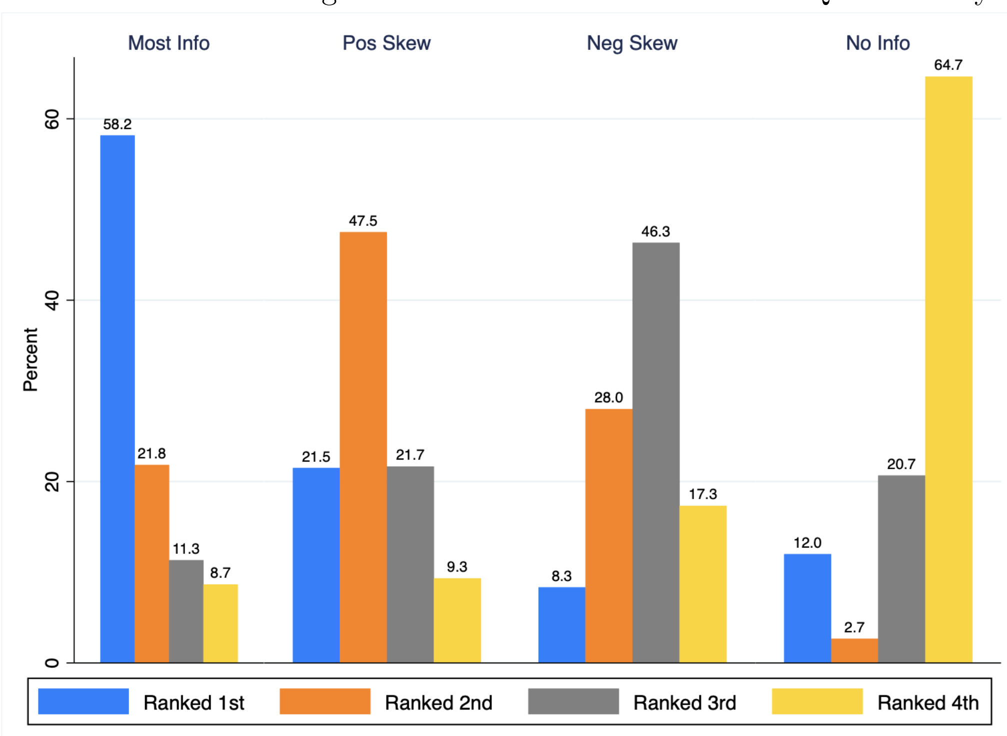
- What's chance you think you have at least one copy of the risky gene? Recall, in the population, the odds are 10-15%. But you may feel that your chances are much higher or much lower. [choose a value between 0-100%]

- What's chance you think you have at least one copy of the protective gene? Recall, in the population, the odds are 5-10%. But you may feel that your chances are much higher or much lower. [choose a value between 0-100%]
- Do you have any first degree relatives (parents, siblings, children) diagnosed with the Alzheimer's disease? [Yes/No]
- Do you have any other reasons to make you believe that you are at a high risk of developing this disease? [Yes, I have been diagnosed with it; I suspect I am at a very high risk of developing the disease; No particular reason to think I have a heightened risk, but I still worry; No, I have no reason to think I am at a higher risk than the average person]
- Please provide feedback about the survey, if you have any. [open ended]

Appendix E. IQ Test Experiment

This study was conducted on the Amazon MTurk platform during the first week of March 2021. The study took about 10 minutes and paid $1.60 for participation conditional on passing the attention check (entering the answer to ten plus ten in numerical form). A total of 703 individuals started the study, 47 did not go past the first page, and 32 failed the attention check, leaving 624 individuals to go on to the IQ tests. A total of 612 individuals completed the IQ tests and 609 completed the entire study. Among them, 9 did not confirm that they made an honest effort at performing their best on the IQ tests, yielding a final sample of 600 individuals. The University of Michigan Institutional Review Board Health Sciences and Behavioral Sciences has determined that this study is exempt from IRB oversight (HUM00191909). The sample is well balanced across gender, age and education: 50% are women; 9% only have a high-school (or equivalent) education, 19% have some college education, 56% graduated from college, and 17% have professional-school or graduate-school degrees. The mean age is 39.8, with a standard deviation of 12.2. Figure 15 displays the histogram of rankings across the four information structures.

Figure 15. Ranking of Information Structures in the IQ Test Study



Consent Form. This is a 10-minute-long survey that will ask you to complete two cognitive tests, and ask questions about your demographics and information preferences. Please pay attention to all instructions / details.

Benefits of the research to the public stem from your participation and honest answers. The purpose of this study is to design better information tools. We do not foresee any risks or discomforts of participating in this survey.

Participating in this study is completely voluntary. Even if you decide to participate now, you may change your mind and stop at any time. You may choose not to continue with the survey at any time and for any reason.

There is no deception in this study.

Information you may receive as a part of this study are meant for research purposes only. They are not meant for medical purposes and cannot be used as a basis of diagnosis. For clinically relevant information you should go to your physician.

We will include attention checks regarding the instructions. Failure to give the correct answer will lead to the termination of the study without payment. Duplicate attempts are not allowed and will not receive payment.

Since you are enrolling in this research study through the Amazon Mechanical Turk (MTurk) site, we need to let you know that information gathered through Amazon MTurk is not completely anonymous. Any work performed on Amazon MTurk can potentially be linked to information about you on your Amazon public profile page, depending on the settings you have for your Amazon profile. Any linking of data by MTurk to your ID is outside of the control of the researcher for this study. We will not be accessing any identifiable information about you that you may have put on your Amazon public profile page. We will store your MTurk worker ID separately from the other information you provide to us. Amazon Mechanical Turk has privacy policies of its own outlined for you in Amazon's privacy agreement. If you have concerns about how your information will be used by Amazon, you should consult them directly.

We will protect the confidentiality of your research records by not publishing any information that may identify you. Information collected in this project may be shared with other researchers. We will not share any information that could identify you. All results will be reported in aggregate.

Investigator: Yesim Orhun, Associate Professor, University of Michigan. If you have questions about this research study, please contact the researchers by emailing aorhun@umich.edu. The University of Michigan Institutional Review Board Health Sciences and Behavioral Sciences has determined that this study is exempt from IRB oversight (HUM00191909).

By clicking to proceed, you are confirming that you read this page and are providing consent to participate.

Front end.

- What is your gender? [Male, Female]
- What is your current age? [open-ended numerical answer]
- What's your education level? [Multiple choice]

- It is important that you pay attention to this study. Please enter ten plus ten in numerical form. [study terminated if the answer was not 20]

– Page Break –

Instructions and introduction of IQ tests.

In a little bit, you will be asked to complete two fluid intelligence assessment tests. These questions are often used to assess IQ. Fluid intelligence is the capacity to think logically and solve problems in novel situations, independent of acquired knowledge. It involves the ability to identify patterns and relationships that underpin novel problems and to extrapolate these findings using logic. In the first test, you will see 14 logic questions presented verbally, some of which are like [2 verbal examples inserted.] In the second test, you will see 13 non-verbal questions where you will be asked to find the image that completes the pattern, like: [one visual example inserted].

These questions are similar to questions that have been used to rank people in terms of their IQ scores in previous research studies. All participants are given 2 minutes to solve as many questions as possible correctly. Some questions are easy for most participants, some questions are hard for most, and some are extremely difficult. The 2-minute limit means that most participants cannot answer all questions in the test. Please try to do your best, so we can assess the distribution of correct answers in the population within the 2-minute time limit.

After taking the tests, you can choose to learn the number of questions you got right (i.e. your raw score). However, because the questions may be easy or hard, the researchers will validate these tests based on the population distribution of correct answers. Where you rank in the distribution of correct answers on these tests should correlate with your fluid intelligence IQ score.

Thank you. Now, you will be forwarded to the intelligence tests. You will see two tests, each is 2 minutes long. Please do your very best. You will be paid at the conclusion of this study, so please click next to continue and take the intelligence tests.

Test 1

You have 2 minutes to answer 14 questions. You can skip a question if you like. Your score will be calculated based on the number of correct answers. The timer will start when you click next. Please proceed when you are ready. [A timer counting down from 2 minutes was always visible. Answer options are reproduced in brackets below but were presented as multiple choice. These questions were created based on pre-existing verbal intelligence practice tests.

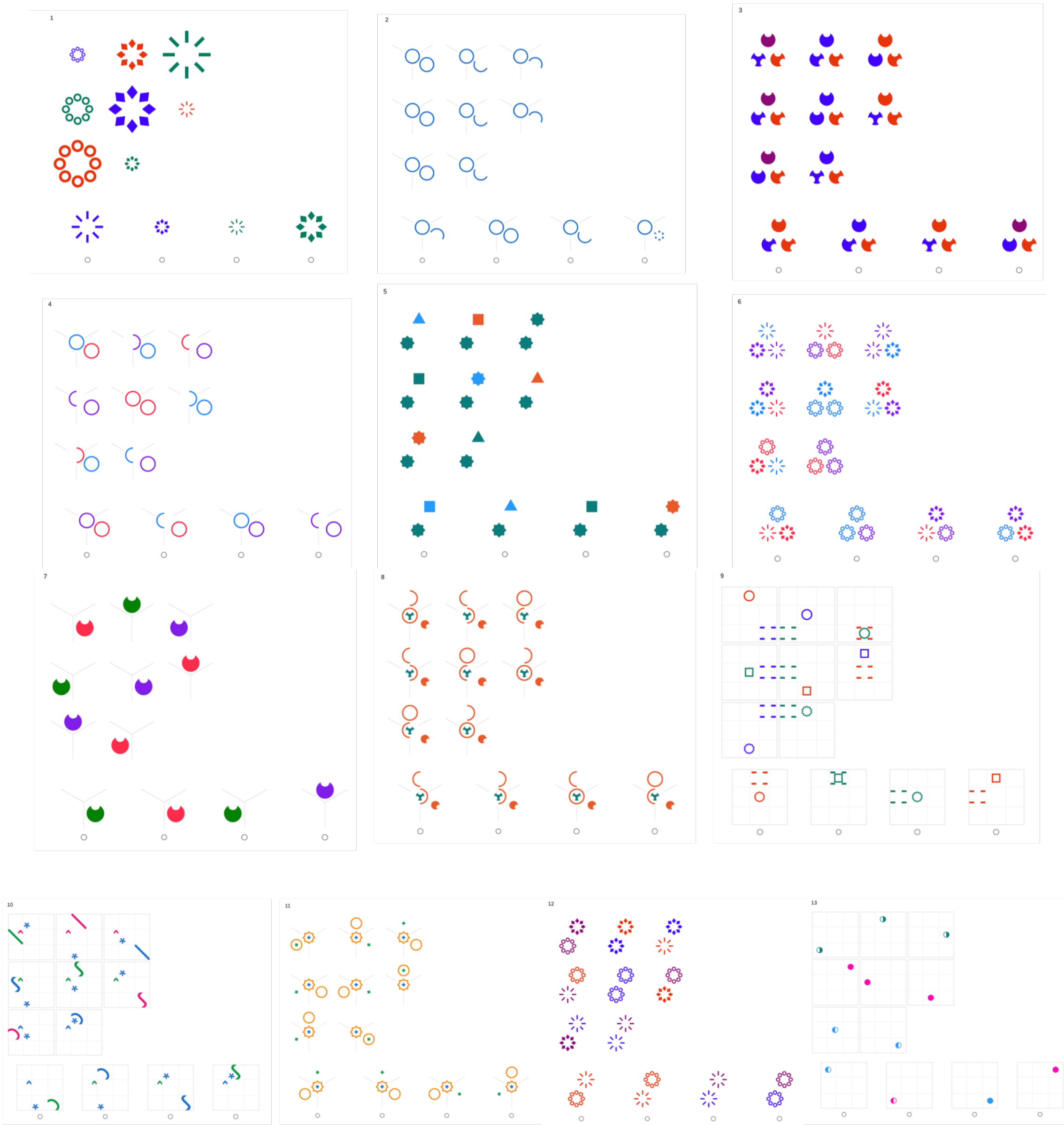
(1) Add the following numbers together 2 3 4 5 6 and divide by 2. What is the answer? [9, 10, 11, 12]
(2) Which number is not divisible by 3? [183, 714, 524, 660, 912]

(3) Examine the following pair of words: pebble - boulder. Choose the pair with the same relationship. [fish - elephant, feather - bird, river - rapids, pond - ocean]
(4) If May's father's brother is Tom's sister's father, Tom is May's .... ? [Brother, Nephew, Cousin, Uncle]
(5) Peculiar means the same as? [Imaginative, New, Strange, Funny, Amazing]
(6) 8 10 11 9 15 21 18 12. Divide the fifth number to the right of ten by three. What is the answer? [4, 5, 6, 7]
(7) Brad is forty-one, and has two sons, Norm and Tim. Norm is nineteen and Tim is nine years younger than Norm. What is half their combined age? [25, 35, 70, 30, 60]
(8) 141···129···118···108··· What comes next? [100, 99, 98 97, 96]
(9) Guile means the opposite of? [Cunning, Weird, Smart, Worried, Candor]
(10) 70···69···65···56···40··· What comes next? [30, 26, 25, 17, 16, 15]
(11) Owen is faster than Brian. Brian is slower than Michael. Peter is not the slowest and Michael is the quickest of the four. Who is the slowest? [Peter, Brian, Owen, Michael]
(12) There are 6 kids and 6 seats. William wants to sit next to Jack. Jack wants to sit next to June. Flora does not want to sit next to Hugh. Dan wants to sit next to William or Flora. June does not want to sit next to Hugh, but wants to sit next to Flora. Flora only wants to sit next to one person. To make all children happy, who should sit next to Hugh? [Dan only, Dan and William, Jack and William, William only, Jack only]
(13) Working together, Tom, Dick, and Harry need 9 hours to paint a fence. Working alone, Tom could complete the task in 18 hours. Dick can not work as fast and needs 36 hours to paint the fence by himself. If Tom and Dick take the day off, how long will it take Harry to paint the fence by himself? [9, 12, 18, 24, 36]
(14) If 'Anne' is thirty-four and 'John' is forty-seven, what number is 'that'? [49, 50, 51, 52, 53]

Test 2

You have 2 minutes to complete this test. You will see 13 questions. Try to answer as many correctly as you can. In each question, you should choose the shape that most logically fits the pattern you see. Click to proceed when you are ready. [These questions were obtained from Chierchia et al. [2019] and are presented in Figure 16.]

Figure 16. 13 Visual Logic Questions Included in the IQ test



After completing the tests, participants moved to answer the following questions in the final part of the study.

Prior elicitation. Out of a random 100 participants chosen from this study, where do you think your performance on fluid intelligence IQ tests would rank? 1 means you would rank as the person with the highest score (1st among 100). 100 means you would rank as the person with the lowest score (last among 100). 50 means that you would rank in the middle of the distribution. [The answer to this question was coded as μ. The participants were shown their answers on the next page and were given a chance to revise their answers.]

You indicated that your expected rank in a random selection of 100 participants would be [μ]. This means that in a random selection of 100 people, on average, you expect [μ] people to score like you or better in fluid intelligence IQ tests, and you expect to score better than [100-μ] people. Is this an accurate description of your expectations? [Yes/No. If No was selected, participants count re-enter their answer.]

Instructions At the end of the study, you will have the choice to learn your raw score on the tests. You also can choose the type of additional information, if any, you would like to get about where you ranked among a random selection of 100 people who also took the same test.

We can give you the answer to one of three feedback options, or no information at all. Your four options are:

A No information about how your IQ score ranks you relative to other people
B Learn whether your score ranked [$topcut_\mu$] or better, ranked between [$topcut_\mu + 1$] and [$bottomcut_\mu - 1$], or ranked [$bottomcut_\mu$] or worse? Depending on the answer, you will either learn that your relative performance was close to your expectations, or that it was significantly better or significantly worse than your expectations.
C Learn whether or not your score ranked [$topcut_\mu$] or better. If the answer is yes, you learn for sure that your performance was significantly higher than you expected. Otherwise, there remains uncertainty: your performance could rank you between top [$topcut_\mu$] and top [μ] or be worse than [μ].
D Learn whether or not your score ranked [$bottomcut_\mu$] or worse. If the answer is yes, you learn for sure that your performance was significantly worse than you expected. Otherwise, there remains uncertainty: your performance could rank you between top [μ] and [$bottomcut_\mu - 1$], or be better than [μ].

[where $topcut_\mu = \mu - \delta_\mu$ and $bottomcut_\mu = \mu + \delta_\mu$. We chose $\delta_\mu = \frac{1}{4} min\{\mu, 100 - \mu\}$.]

Information structure preference elicitation

We would like to know your preferences across these options. The option you rank as 1st will have a 60% chance of being chosen, the option you rank as 2nd will have a 30% chance of being chosen, the option you rank as 3rd will have a 10% chance of being chosen, and the option you rank as 4th will never be chosen. The answer to the chosen option will be shown to you. Therefore, please think carefully about the type of information, if any, you would like to receive.

- Please pick which of the four options below is your most preferred (most likely to be chosen) [A, B, C, D.]
- Please pick which of the four options below is your least preferred (never chosen) [A, B, C, D.]
- *(Presented on the next page to allow for piping of unchosen options)* Please pick which of the two remaining options you prefer more than the other (the one you choose will have 30% of being selected, while the other one will have a 10% chance of being selected) [Two remaining options]

Then the participants were shown the implied ranking and were given a chance to revise the ranking if needed before moving on. They were also asked:

Would you like to know about the number of questions you got right on each test? [Yes/No]

Feedback Based on your information preferences, [option] was chosen to be revealed to you. The answer is: [answer]

If participants wanted to learn their scores, they also saw: Out of the 14 questions presented in the verbal reasoning test, you attempted [number] questions and got [number] of them correct. Out of the 13 questions presented in the matrices test, you attempted [number] questions and got [number] of them correct. Recall that these results are for research purposes only. If you have concerns about your cognitive functioning, please see your doctor.

Thank you for your answers. This concludes the study.

Appendix F. Formal Definitions

We will provide formal definitions for the theoretical discussion in the paper. We first discuss the environment, then axiomatic characterizations of preferences, then particular functional forms of preferences. In order to link our discussion more closely to the existing literature, this Appendix will work with a domain of two-stage compound lotteries, the set of which are equivalent to the set of prior, information structure pairs, the domain used in the body of the paper.

Formally, consider an interval $[w, b] = X \subset \mathbb{R}$ of money. Let Δ_X be the set of all simple lotteries on X. A lottery $F \in \Delta_X$ is a function from X to $[0,1]$ such that $\sum_{x \in X} F(x) = 1$ and the number of prizes with non-zero support is finite. $F(x)$ represents the probability assigned to the outcome x in lottery F. For any lotteries F, G, we let $\alpha F + (1-\alpha)G$ be the lottery that yields x with probability $\alpha F(x) + (1-\alpha)G(x)$. Denote by δ_x the degenerate lottery that yields x with probability 1. Next, denote $\Delta(\Delta_X)$ as the set of simple lotteries over Δ_X. For $P, Q \in \Delta(\Delta_X)$ denote $R = \alpha P + (1-\alpha)Q$ as the lottery that yields simple (one-stage) lottery F with probability $\alpha P(F) + (1-\alpha)Q(F)$. Denote by D_F the degenerate, in the first stage, a compound lottery that yields F with certainty. $\succsim$ is a weak order over $\Delta(\Delta_X)$ which represents the decision-maker's preferences over lotteries and is continuous (in the weak topology). Moreover, we will define a reduction function that maps compound lotteries to reduced one-stage lotteries: $\phi(P) = \sum_{F \in \Delta_X} P(F)F$.

Given a function V on the set of probability measures Δ_X, for each $P \in \Delta(\Delta_X)$ we say that V is Gateaux differentiable at P in $\Delta(\Delta_X)$ if there is a measurable function $v(\cdot; P)$ on Δ_X such that for any Q in $\Delta(\Delta_X)$ and any $\alpha \in (0,1)$:

$$V(\alpha Q + (1-\alpha)P) - V(P) = \alpha \int v(z;P)[Q(dz) - P(dz)] + o(\alpha)$$

where $o(\alpha)$ is a function with the property that $\frac{o(\alpha)}{\alpha} \to 0$ as $\alpha \to 0$. $v(\cdot; P)$ is the Gateaux derivative of V at P. V is Gateaux differentiable if V is Gateaux differentiable at all P. We call $v(\cdot; P)$ the local utility function at P.

Now consider the set of prior-information structure pairs, such that the prior f has support on $[w, b]$. Formally, we imagine there are a finite number N of indexed states ω_i. Each state corresponds to a different payoff for the individual. Moreover, there are M signals indexed by s_j. An information structure I is an N by M matrix, such that the entries in each row sum to 1. The i,j-th entry of the matrix, denoted I_{ij} gives the probability that signal s_j is realized if the state is ω_i. Given a prior distribution f over states, if the individual utilizes Bayes' rule then a posterior probability of state ω_i conditional on observing signal s_j is given by:

$$\psi_j(\omega_i) = \frac{f(\omega_i)I_{ij}}{\sum_k f(\omega_k)I_{kj}}$$

As mentioned in the body, we suppose that individuals have preferences over information structures given the prior f, denoted by $\succsim_f$. Also, as mentioned, formally, within the economics literature, these are typically modeled as preferences over two-stage compound lotteries; lotteries over lotteries. Each signal s_i induces a lottery over outcomes — the posterior distribution ψ_j. This is the lottery that individuals face in period 1 after receiving information. In period 0, the individual faces a lottery over these possible lotteries — signal s_j is received with probability $\sum_i f(\omega_i)I_{ij} := p(s_j)$. There is a natural bijection between prior-information structure pairs and two-stage compound lotteries. Not only can we map a prior-information structure pair into a (unique) two-stage compound lottery, but we can also show that any given two-stage compound lottery maps into a unique prior-information structure pair. Given a two-stage lottery P with support $p_1, \ldots, p_n$ we first can find f, the prior: $\phi(P)(\omega_i) = f(\omega_i)$. To identify I, observe that we have a set of equations $p_j(\omega_i) = \psi_j(\omega_i) = \frac{f(\omega_i)I_{ij}}{\sum_k f(\omega_k)I_{kj}}$, along with restrictions on the elements of I discussed in the main text (and with a known f). These form a set of equations that generates a unique solution I. Given this, we can naturally map preferences and utility functionals, from the space of prior-information structure pairs to the space of compound lotteries and vice versa.

We next summarize Kőszegi and Rabin's functional form. Given a gain-loss functional η, a scalar weight on expected utility κ, a scalar weight on the first-period gain-loss utility of ν, and denoting, given a distribution h over the payoff across states, any $\zeta \in (0,1)$. Let $u(\omega_h(\xi))$ denote the utility of the payoff level at percentile ξ. Then the functional form is:[34]

$$\begin{aligned} V^{KR}(f,I) &= \kappa E_f(u(\omega_i)) + \nu \sum_j p(s_j) \int_0^1 \eta(u(\omega_{\psi_j}(\xi)) - u(\omega_f(\xi)))d\xi \\ &\quad + \sum_i \sum_j p(s_j)\psi_j(\omega_i) \int_0^1 \eta(u(\omega_i(\xi)) - u(\omega_{\psi_j}(\xi)))d\xi \end{aligned}$$

Because this is a complicated functional form, we will define the function for our simple binary-binary setup. The probability of good signal is $p(G) = fp + (1-f)(1-q)$, and the probability of bad signal is $p(B) = f(1-p) + (1-f)q$. $p_j(\omega_i)$ denotes the posterior probability of state i after observing signal j. Normalizing the Bernoulli utility of the high and low outcomes to 0 and 1 the total utility of an information structure is:

$$\begin{aligned} V^{KR}(f,I) &= \kappa f + \nu\Big[p(G)\eta(1-0)(p_G(H) - f) + p(B)\eta(0-1)(f - p_B(H))\Big] \\ &\quad + p(G)\Big[p_G(H)\eta(1-0)p_G(L) + p_G(L)\eta(0-1)p_G(H)\Big] \\ &\quad + p(B)\Big[p_B(H)\eta(1-0)p_B(L) + p_B(L)\eta(0-1)p_B(H)\Big] \end{aligned}$$

The next functional forms we consider are those introduced in Ely, Frankel and Kamenica (2013)Ely et al. [2015]. They have two models, both of which deliver the same predictions regarding skewness. We provide more general forms of their models and allow for individuals' overall utility to depend both on the expected utility of the two-stage lottery as well as suspense or surprise; and weight suspense and surprise differently across periods.

[34]Denoting beliefs in Period 0 as f (our prior) and the beliefs in Period 1 (after receiving signal s_j) as ψ_j.

We denote ϑ as a function that turns suspense and surprise into utils. As before we have a scalar weight on the expected utility term of κ and a scalar weight on first-period suspense or surprise utility of ν.

We first consider a generalized version of Ely, Frankel and Kamenica's model of suspense, where overall utility is given by:

$$\begin{aligned} V_{sus}^{EFK}(f,I) &= \kappa E_f(u(\omega_i)) + \nu\vartheta\Big(\sum_j p(s_j)\sum_i (p_j(\omega_i) - f(\omega_i))^2\Big) \\ &\quad + \sum_j p(s_j)\vartheta\Big(\sum_i p_j(\omega_i)\sum_i (\mathbb{1} - p_j(\omega_i))^2\Big) \end{aligned}$$

Simplifying to our binary-binary environment, we obtain:

$$\begin{aligned} V_{sus}^{EFK}(f,I) &= \kappa f + \nu\vartheta\Big(p(G)2(p_G(H) - f)^2 + p(B)2(f - p_B(H))^2\Big) \\ &\quad + p(G)\vartheta\Big(p_G(H)2p_G(L)^2 + p_G(L)2p_G(H)^2\Big) \\ &\quad + p(B)\vartheta\Big(p_B(H)2p_B(L)^2 + p_B(L)2p_B(H)^2\Big) \end{aligned}$$

Ely, Frankel and Kamenica also provide a model of surprise, which we generalize, so that utility is:

$$\begin{aligned} V_{surp}^{EFK}(f,I) &= \kappa E_f(u(\omega_i)) + \nu\sum_j p(s_j)\vartheta\Big(\sum_i (p_j(\omega_i) - f(\omega_i))^2\Big) \\ &\quad + \sum_j p(s_j)\sum_i p_j(\omega_i)\vartheta\Big(\sum_i (\mathbb{1} - p_j(\omega_i))^2\Big) \end{aligned}$$

In our binary-binary setting, this becomes:

$$\begin{aligned} V_{surp}^{EFK}(f,I) &= \kappa f + \nu\Big[p(G)\vartheta\Big(2(p_G(H) - f)^2\Big) + p(B)\vartheta\Big(2(f - p_B(H))^2\Big)\Big] \\ &+ \quad p(G)\Big[p_G(H)\vartheta\Big(2p_G(L)^2\Big) + p_G(L)\vartheta\Big(2p_G(H)^2\Big)\Big] \\ &+ \quad p(B)\Big[p_B(H)\vartheta\Big(2p_B(L)^2\Big) + p_B(L)\vartheta\Big(2p_B(H)^2\Big)\Big] \end{aligned}$$

We now discuss the functional form of peak-trough utility developed in Gul et al. [2021], and specifically, the restricted form used Gul et al. [2022]. Given any two-stage compound lottery P, each sub-lottery p_i, and each outcomes $x \in \text{support}(p_i)$ generates a sequence $(\phi(P), p_i, \delta_x)$. This sequence occurs with ex-ante chance $P(p_i)p_i(x)$.

Given a utility function u_1 that maps a belief to the set of weakly positive reals, an aggregator u_2 that maps weakly positive reals to weakly positive reals, the utility from P is then

$$
\begin{aligned}
\textstyle\sum_{p_i} \quad & \sum_{x \in \text{support}(p_i)} P(p_i)p_i(x)[\frac{1-\theta_H-\theta_L}{3}[u_2(u_1(\phi(P)) + u_2(u_1(p_i)) + u_2(u_1(\delta_x))] \\
+ \quad & \theta_H u_2(\max\{u_1(\phi(P)), u_1(p_i), u_1(\delta_x)\}) + \theta_L u_2(\min\{u_1(\phi(P)), u_1(p_i), u_1(\delta_x)\})]
\end{aligned}
$$

We will focus on situations where u_1 and u_1 are both the identity mapping, so that utility becomes

$$
\begin{aligned}
\textstyle\sum_{p_i} \quad & \sum_{x \in \text{support}(p_i)} P(p_i)p_i(x)[\frac{1-\theta_H-\theta_L}{3}[\phi(P) + p_i + \delta_x] \\
+ \quad & \theta_H v(\max\{\phi(P), p_i, \delta_x\}) + \theta_L v(\min\{\phi(P), p_i, \delta_x\})]
\end{aligned}
$$

Appendix G. Proofs

We first formalize the fact that we the set $\mathbb{S} := \{(p,q)|\ p+q > 1\} \cup (.5,.5)$ naturally captures the natural interpretation of signals (Lemma A), and we can consider it without loss of generality (Lemma B).

Lemma A *For any $(p,q) \in \mathbb{S}$, observing a good signal increases the posterior on high outcome relative to the prior, and observing a bad signal decreases the posterior on high outcome relative to the prior.*

Proof We will prove each part of the Lemma in turn. First we prove the first part. Recall that for a given prior $0 < f < 1$ on a high payoff and information structure (p,q), the posterior for the high payoff given the good signal is

$$\psi_G = \frac{fp}{fp + (1-f)(1-q)}.$$

Now $\psi_G > f$ if and only if

$$\psi_G = \frac{fp}{fp + (1-f)(1-q)} > f,$$

which holds if and only if

$$(1-f)p > (1-f) - (1-f)q,$$

which is the same as

$$p + q > 1.$$

An analogous series of steps establishes the result for the posterior after observing a bad signal. □

Lemma B *For any signal structure $(p',q') \in [0,1] \times [0,1]$, there exists a $(p,q) \in \mathbb{S}$ that generates the same posterior distribution. However, for any $T \subset \mathbb{S}$ there exists a $(p',q') \in \mathbb{S}$ such that there is no element of T that generates the same posterior distribution as (p',q').*

Assume that $p+q < 1$ (observe that all signal structures on $p+q = 1$ give the same posterior distribution). In this case, denote $p' = 1-p$ and $q' = 1-q$. We will work with likelihood ratios rather than posterior beliefs. Under (p,q), likelihood ratio $\frac{p}{1-q}$ occurs with probability $fp+(1-f)(1-q)$ and likelihood ratio $\frac{1-p}{q}$ occurs with probability $f(1-p)+(1-f)q$.

Under (p',q') likelihood ratio $\frac{1-p'}{q'} = \frac{p}{1-q}$ occurs with probability $f(1-p') + (1-f)q' = fp + (1-f)(1-q)$. Likelihood ratio $\frac{p'}{1-q'} = \frac{1-p}{q}$ occurs with probability $fp' + (1-f)(1-q') = f(1-p) + (1-f)q$. Therefore (p',q') generates the same posterior distribution as (p,q). Moreover, $p'+q' = (1-p)+(1-q) = 2-p-q \geq 1$ since $p+q \leq 1$. So therefore, instead of considering some (p,q) we can always instead consider the corresponding $p' = 1-p, q' = 1-q$.

To prove the second part observe that in order for two signal structures (p,q) and (p',q'), both in $\mathbb{S}$, to generate the same posteriors it must be the case that $\frac{p'}{1-q'} = \frac{p}{1-q}$ and $\frac{1-p'}{q'} = \frac{1-p}{q}$.

Therefore $p' - p'q = p - pq'$ and $q - p'q = q' - pq'$, which is equivalent to $q = \frac{-p+pq'+p'}{p'}$ and $q = \frac{q'-pq'}{1-p'}$. Simplifying, we have $\frac{-p+pq'+p'}{p'} = \frac{q'-pq'}{1-p'}$, or $p'q' - pq'p' = -p + pq' + p' + pp' - pp'q' - p'^2$. This holds if and only if $p'q' = -p+pq'+p'+pp'-p'^2$, or $p(1-q'-p') = -p'q'+p'-p'^2 = p'(1-q'-p')$. This equality holds if and only if $p = p'$ or $q' + p' = 1$. The latter case implies that $p' = q' = .5$ which implies $p = q = .5$. The former immediately implies $q = q'$. □

Blackwell's ordering was originally designed to be used in situations in which the individual's payoff in Period 2 depends on both the state and action taken by individuals in Period 1. However, as Kreps and Porteus [1978] and Grant et al. [1998] demonstrate, there is a meaningful mapping between Blackwell's ordering and information preferences even when information is non-instrumental (i.e., when individuals cannot take any action based on it). We next prove Lemma 1, which formalizes the conditions that allow us to Blackwell rank signals.

Lemma 1 (p', q') *Blackwell dominates (is Blackwell more informative than)* (p, q) *if and only if* $p' \geq \max\{\frac{p}{1-q}(1-q'), 1-q'\frac{1-p}{q}\}$.

Proof Recall that one signal structure (p', q') is Blackwell more informative than another (p, q) if and only if the distribution of posteriors induced by (p', q') is a mean preserving spread of the distribution induced by (p, q). By the law of iterated expectations, the expected posterior under (p', q') and (p, q) must be the same — the prior. Because there are only 2 signals (and so 2 posteriors) as well as only 2 states, the problem reduces to showing that the posteriors under (p', q') are more extreme (in the sense that they are farther from the prior) than the posteriors under (p, q). In order to simplify the proofs, we will show an equivalent result — that the likelihood ratios under (p', q') are more extreme (farther from 1) than the likelihood ratios under (p, q).

The likelihood ratios after observing a good signal under (p', q') and (p, q) are (respectively) $\frac{p'}{1-q'}$ and $\frac{p}{1-q}$ while the likelihood ratios after observing a bad signal are $\frac{1-p'}{q'}$ and $\frac{1-p}{q}$.

In order for the ratios under (p', q') to be farther from 1 than (p, q), then $\frac{p'}{1-q'} \geq \frac{p}{1-q}$ and $\frac{1-p'}{q'} \leq \frac{1-p}{q}$. This is equivalent to $p' \geq \frac{p}{1-q} - \frac{p}{1-q}q'$ and $p' \geq 1 - q'\frac{1-p}{q}$. □

Proposition 1 *Let* $\succsim_f$ *be represented by a Gateaux differentiable value function* V. *Suppose i)* $var(p, q) = var(p', q')$, *ii)* $skew(p, q) = -skew(p', q')$, *and iii)* $skew(p, q) > 0$ *given* f. *If the local utility function of* V *is thrice differentiable then it has a convex (concave) derivative everywhere if and only if* $(p, q) \succsim_f (\precsim_f)(p', q')$.

Proof We prove the result in two parts. First, we show that if i) $var(p, q) = var(p', q')$, ii) $skew(p, q) = -skew(p', q')$, and iii) $skew(p, q) > 0$ then (p, q) induces a posterior distribution with less downside risk, in the sense of Menezes et al. [1980], than that induced by (p', q'). We then show that (p, q) induces a posterior distribution with less downside risk than that induced by (p', q') if and only if (p, q) gives a higher utility value than (p', q') for all V's with thrice differentiable positive third derivatives.

- Denote the posterior distributions induced by (p, q) and (p', q') as Z_1 and Z_0 respectively. Denote the posterior beliefs after a good or bad signal for each distribution respectively as ψ_L, ψ_H, and ψ'_L, ψ'_H. Since they have the same mean and variance, but the former distribution has positive skew, then $\psi'_L \leq \psi_L \leq f \leq \psi'_H \leq \psi_H$. Denote the associated probabilities with each posterior as $\rho_{Z_0}(\phi'_L), \rho_{Z_1}(\phi_L), \rho_{Z_0}(\phi'_H)$ and $\rho_{Z_1}(\phi_H)$. Since the posteriors have the same mean $\rho_{Z_0}(\phi'_L) < \rho_{Z_1}(\phi_L)$ and $\rho_{Z_0}(\phi'_H) > \rho_{Z_1}(\phi_H)$.

  From Menezes et al. [1980] we know that Z_1 has less downside risk than Z_0 if we can obtain Z_0 from Z_1 by a mean-preserving spread of beliefs on the lower tail of the distribution, and a mean preserving contraction on the upper tail of the distribution (formally the effects of the spread have to come everywhere before the effects of the contraction); where the joint effect of the two transformations is to preserve variance.

  We construct such a transformation. First take the weight attached to ϕ_L (i.e., $\rho_{Z_1}(\phi_L)$). We split this weight; attaching weight $\rho_{Z_0}(\phi'_L)$ to ϕ'_L. We then attach the remaining weight to a posterior $\hat{\phi}$ so that $\frac{\rho_{Z_0}(\phi'_L)\phi'_L + (1-\rho_{Z_0}(\phi'_L))\hat{\phi}}{\rho_{Z_1}(\phi_L)} = \phi_L$. Observe that by construction $\hat{\phi} < \phi'_H$ (if it was not, the mean of the distribution with support on $\phi'_L, \hat{\phi}$ and ϕ_H would be below f).

  We now have a distribution with support on three outcomes: $\phi'_L, \hat{\phi}$ and ϕ_H. This still has a mean of f, since our initial transformation was mean preserving. We then take the weight attached to $\hat{\phi}$ and the weight attached to ϕ_H and combine them on ϕ'_H. Observe that this is possible since $\hat{\phi} < \phi'_H < \phi_H$. By construction this weight must be $1 - \rho(\phi'_L) = \rho(\phi'_H)$. After this transformation, the new distribution must also have the same mean f (by assumption).

  Since we kept the weight on ϕ'_L constant, and the overall mean of the two distributions (the one with support on $\phi'_L, \hat{\phi}$ and ϕ_H and the one with support only on ϕ'_L and ϕ'_H) then the conditional mean, looking only at the support of either $\hat{\phi}, \phi_H$ in the first distribution, or ϕ'_H in the second, must also be the same.

  Thus, we can obtain Z_0 from Z_1 by a mean preserving spread and then a mean preserving contraction which preserves the overall variance.
- We show both directions. First, assume that all local utility functions are thrice differentiable and have a positive third derivative. Denote the local utility function $v(\cdot; P)$. Given f, suppose information structure (p, q) generates a posterior distribution Z_1 and (p', q') generates posterior distribution Z_0 where Z_0 has more downside risk than Z_1. We need to show that $V(Z_1) - V(Z_0) \geq 0$.

  Let $Z(\alpha) = \alpha Z_1 + (1-\alpha) Z_0$. By Grant et al. [1998] (pg 255) because V is Gateaux differentiable $\frac{d}{d\alpha} V(Z(\alpha))|_{\alpha=\beta}$ exists for any β in $(0,1)$ and is equal to $\int v(z; Z(\beta))[Z_1(dz) - Z_0(dz)]$. Observe that this is simply the expected value of v under Z_1 less the expected value of v under Z_0. By Theorem 2 of Menezes et al. [1980] this is positive for any $\beta \in (0,1)$. Integrating with respect to β yields $V(Z(1)) - V(Z(0)) \geq 0$ which gives the required result since $V(Z(1)) = V(Z_1)$ and $V(Z_0) = V(Z(0))$.

Now, we show the other direction via the contra-positive. Suppose that there exists a local utility function $v(.,X)$ that does not have a convex derivative. Denote one interval where the derivative is everywhere concave $A = [a_0, a_1]$. Then we can find a prior in A as well as two signal structures (p,q) and (p',q') so that the posterior distributions are wholly contained in A. Denote the posterior distributions of beliefs Y and Y' respectively, and we will suppose that they have the same variance and same absolute level of skewness but Y' has more downside risk (i.e. is negatively skewed, while Y is positively skewed). Then $v(Y;X) > v(Y';X)$ by the reasoning in the previous paragraph.

For each $\epsilon \in (0,1)$ let $Z_0(\epsilon)$ and $Z_1(\epsilon)$ be posterior distributions given by $\epsilon Y' + (1-\epsilon)X$ and $\epsilon Y + (1-\epsilon)X$ respectively.

First, observe that $Z_0(\epsilon)$ and $Z_1(\epsilon)$ have the same mean. Second, the latter can be obtained from the former by the same procedure as in Step 1 of this proof, albeit using the probabilities there as conditional probabilities. Using the Gateaux differentiability of W at X, $W(Z_0(\epsilon)) - W(X) = W(\epsilon Y' + (1-\epsilon)X) - W(X) = \int v(\mu;X)[\epsilon Y'(d\mu) - \epsilon X(d\mu)]+) + o_1(\epsilon)$ and $W(Z_1(\epsilon)) - W(X) = W(\epsilon Y + (1-\epsilon)X) - W(X) = \int v(\mu;X)[\epsilon Y(d\mu) - \epsilon X(d\mu)] + o_2(\epsilon)$; where $\frac{o_1(\epsilon)}{\epsilon} \to 0$ and $\frac{o_1(\epsilon)}{\epsilon} \to 0$ as $\epsilon \to +0$. Taking the difference between the two expressions we get $W(Z_0(\epsilon)) - W(Z_1(\epsilon)) = \int v(\mu;X)[\epsilon Y' d(\mu) - \epsilon Y d(\mu)] + o_1(\epsilon) - o_2(\epsilon) = \epsilon(v(Y',X) - v(Y,X)) + o_1(\epsilon) - o_2(\epsilon)$. Hence $\frac{1}{\epsilon[W(Z_0(\epsilon)) - W(Z_1(\epsilon))]} > 0$ for small enough ϵ, or in other words, the value of the negatively skewed signal is larger. □

Proposition 2 *Let $\succsim_f$ be represented by a Gateaux differentiable value function V. If the local utility functions $v(\cdot;P)$ of V are (i) monotone and thrice differentiable (ii) convex (concave respectively) for all $v(\cdot;P) \geq (\leq$ respectively $)v(f(P);P)$ and (iii) loss averse: $|v(f(P)-\epsilon;P) - v(f(P);P)| > |v(f(P)+\epsilon;P) - v(f(P);P)|$ for all $\epsilon > 0$, then the individual will prefer no information to either negatively skewed information or symmetric information, but will accept some positively skewed information.*

Proof Denote the local utility function $v(\cdot;P)$. Given f, suppose information structure (p,q) generates a posterior distribution Z_1. We compare this to Z_0 which is a degenerate distribution induced by no information.

Let $Z(\alpha) = \alpha Z_1 + (1-\alpha)Z_0$. By Grant, Kajii and Polak (pg 255) because V is Gateaux differentiable $\frac{d}{d\alpha}V(Z(\alpha))|_{\alpha=\beta}$ exists for any β in $(0,1)$ and is equal to $\int v(z;Z(\beta))[Z_1(dz) - Z_0(dz)]$. Observe that this is simply the expected value of v under Z_1 less the expected value of v under Z_0. Integrating with respect to β yields $V(Z(1)) - V(Z(0))$ which is exactly $V(Z_1) - V(Z_0)$.

Since Z_1 and Z_0 both are posterior distributions with the same reduced form distribution over outcomes (i.e., they come from the same prior), then any convex combination of them will also have the same reduced form distribution over outcomes (i.e., prior). Thus we are integrating over local utility functions where the second argument always has the same prior f.

Observe that Condition (iii) of the proposition implies that for all $0 \leq \epsilon \leq \min\{f, 1-f\}$, $\frac{1}{2}v(f(P)-\epsilon;P) + \frac{1}{2}v(f(P)+\epsilon;P) \leq v(f(P);P)$. This means that the individual refuses all symmetric information structures since $\int v(z;P)[Z_1(dz) - Z_0(dz)]$ is negative for any symmetric Z_1.

Condition (ii) implies that there are at least some positively skewed signals that the decision-maker will accept. In particular, observe that since v is concave we know that $\lim_{\epsilon\to 0^+}(1-\epsilon)v(f(P);P) + \epsilon v(1;P) \geq v(f(P);P)$. Therefore there exists a positively skewed Z_1 such that $\int v(z;f)[Z_1(dz) - Z_0(dz)] > 0$. Since this is true for every v we integrate over, when we integrate up over β, it still must be true.

Conditions (i) and (ii) together imply that individuals will refuse negatively skewed information. Suppose the posteriors induced by the negatively skewed structure are x_L and x_H. Then we can always find a symmetric structure with posteriors $\hat{x}_L$ and x_H. Notice that $\hat{x}_L > x_L$, and that both $\hat{x}_L$ and x_L are on the concave portion of v, implying that the value of v under the negatively skewed signal is worse than under the symmetric structure. Since this is true for every v we integrate over, when we integrate up over β, it still must be true.

□

Proposition 3 *Suppose preferences represented by a KR or EFK functional form. Then* $(x,y) \sim_{.5} (y,x)$.

Proof We discussed KR's functional form previously. In our environment utility is:

$$\begin{aligned}
V^{KR}(f,I) &= \kappa f + \nu\Big[p(G)\eta(1)(p_G(H)-f) + p(B)\eta(-1)(f - p_B(H))\Big] \\
&\quad + p(G)\Big[p_G(H)\eta(1)p_G(L) + p_G(L)\eta(-1)p_G(H)\Big] \\
&\quad + p(B)\Big[p_B(H)\eta(1)p_B(L) + p_B(L)\eta(-1)p_B(H)\Big] \\
&= \kappa f + \nu\Big[\eta(1)p(G)(\frac{fp}{p(G)} - f) + \eta(-1)p(B)(f - \frac{f(1-p)}{p(B)})\Big] \\
&\quad + \Big[\eta(-1)+\eta(-1)\Big]\Big[p(G)p_G(H)(1-p_G(H)) + p(B)p_B(L)(1-p_B(L))\Big] \\
&= \kappa f + \nu\Big[\eta(1)+\eta(-1)\Big]f(1-f)(p+q-1) \\
&\quad + \Big[\eta(-1)+\eta(-1)\Big]\Big[p(G)p_G(H)(1-p_G(H)) + p(B)p_B(L)(1-p_B(L))\Big]
\end{aligned}$$

Setting $f = .5$, then we must have $p(G)|_{(p,q)} = p(B)|_{(q,p)}$ and $p_G(H)|_{(p,q)} = p_B(L)|_{(q,p)}$. Therefore,

$$V^{KR}(.5,(p,q)) = V^{KR}(.5,(q,p))$$

We next turn to the EFK functional forms. Using their model of suspense, we have

$$
\begin{aligned}
V_{sus}^{EFK}(f,(p,q)) &= \kappa f + \nu\vartheta\Big(p(G)2(p_G(H)-f)^2 + p(B)2(f-p_B(H))^2\Big) \\
&\quad + p(G)\vartheta\Big(p_G(H)2p_G(L)^2 + p_G(L)2p_G(H)^2\Big) \\
&\quad + p(B)\vartheta\Big(p_B(H)2p_B(L)^2 + p_B(L)2p_B(H)^2\Big) \\
&= \kappa f + \nu\vartheta\Big(p(G)2(\frac{fp}{p(G)}-f)^2 + p(B)2(f-\frac{f(1-p)}{p(B)})^2\Big) \\
&\quad + p(G)\vartheta\Big(2p_G(H)(1-p_G(H))^2 + 2(1-p_G(H))p_G(H)^2\Big) \\
&\quad + p(B)\vartheta\Big(2(1-p_B(L))p_B(L)^2 + 2p_B(L)(1-p_B(L))^2\Big) \\
&= \kappa f + \nu\vartheta\Big(2f^2(1-f)^2(p+q-1)^2(\frac{1}{p(G)}+\frac{1}{p(B)})\Big) \\
&\quad + p(G)\vartheta\Big(2p_G(H)(1-p_G(H))\Big) + p(B)\vartheta\Big(2p_B(L)(1-p_B(L))\Big)
\end{aligned}
$$

Setting $f = .5$, then we must have $p(G)|_{(p,q)} = p(B)|_{(q,p)}$ and $p_G(H)|_{(p,q)} = p_B(L)|_{(q,p)}$. Hence, $V_{sus}^{EFK}(.5,(p,q)) = V_{sus}^{EFK}(.5,(q,p))$.

We next derive the result for EFK's model of surprise.

$$
\begin{aligned}
V_{surp}^{EFK}(f,(p,q)) &= \kappa f + \nu\Big[p(G)\vartheta\Big(2(p_G(H)-f)^2\Big) + p(B)\vartheta\Big(2(f-p_B(H))^2\Big)\Big] \\
&\quad + p(G)\Big[p_G(H)\vartheta\Big(2p_G(L)^2\Big) + p_G(L)\vartheta\Big(2p_G(H)^2\Big)\Big] \\
&\quad + p(B)\Big[p_B(H)\vartheta\Big(2p_B(L)^2\Big) + p_B(L)\vartheta\Big(2p_B(H)^2\Big)\Big] \\
&= \kappa f + \nu\Big[p(G)\vartheta\Big(2(\frac{fp}{p(G)}-f)^2\Big) + p(B)\vartheta\Big(2(f-\frac{f(1-p)}{p(B)})^2\Big)\Big] \\
&\quad + p(G)\Big[p_G(H)\vartheta\Big(2(1-p_G(H))^2\Big) + (1-p_G(H))\vartheta\Big(2p_G(H)^2\Big)\Big] \\
&\quad + p(B)\Big[(1-p_B(L))\vartheta\Big(2p_B(L)^2\Big) + p_B(L)\vartheta\Big(2(1-p_B(L))^2\Big)\Big]
\end{aligned}
$$

Then

$$
\begin{aligned}
V_{surp}^{EFK}(f,(p,q)) &= \kappa f + \nu\Big[p(G)\vartheta\Big(\frac{2f^2(1-f)^2(p+q-1)^2}{p(G)^2}\Big) + p(B)\vartheta\Big(\frac{2f^2(1-f)^2(p+q-1)^2}{p(B)^2}\Big)\Big] \\
&\quad + p(G)\Big[p_G(H)\vartheta\Big(2(1-p_G(H))^2\Big) + (1-p_G(H))\vartheta\Big(2p_G(H)^2\Big)\Big] \\
&\quad + p(B)\Big[(1-p_B(L))\vartheta\Big(2p_B(L)^2\Big) + p_B(L)\vartheta\Big(2(1-p_B(L))^2\Big)\Big]
\end{aligned}
$$

Setting $f = .5$, then we must have $p(G)|_{(p,q)} = p(B)|_{(q,p)}$ and $p_G(H)|_{(p,q)} = p_B(L)|_{(q,p)}$. Hence, we have

$$V_{surp}^{EFK}(.5,(p,q)) = V_{surp}^{EFK}(.5,(q,p))$$

Proposition 4 *Suppose $\succsim_{.5}$ is represented by peak-trough utility with u_1 and u_2 the identity mapping, and i) $var(p,q) = var(p',q')$, ii) $skew(p,q) = -skew(p',q')$, and iii) $skew(p,q) > 0$. Then $(p,q) \succsim_{.5} (q,p)$ if and only if $\theta_H + \theta_L \leq 0$.*

Proof Consider two binary-binary information structures, both of which have the same variance, and the same absolute skew. Formally, consider two compound lotteries, P and Q such that both have the same equal prior over the two outcomes: $\phi(P) = \phi(Q) = .5$. The positively skewed structure has two sub-lotteries: $1-p_1, p_2$, and the negatively skewed lottery has two sub-lotteries $1-p_2, p_1$ where $0 \leq p_1 < p_2 < .5 < 1-p_2 < 1-p_1 \leq 1$. These two lotteries have the same variance and absolute level of skewness. By construction $P(p_1)p_1 + (1-P(p_1))(1-p_2) = .5 = P(p_1)(1-p_1) + (1-P(p_1))p_2$. Table 17 shows the distribution of peaks and troughs for positively skewed and negatively skewed information structures.

Table 17. Distribution of path, peaks, and troughs

	Path	Peak	Trough	Probability
Positively Skewed				
	$(1/2, 1-p_1, 1)$	1	$1/2$	$P(p_1)(1-p_1)$
	$(1/2, 1-p_1, 0)$	$1-p_1$	0	$P(p_1)p_1$
	$(1/2, p_2, 1)$	1	p_2	$(1-P(p_1))p_2$
	$(1/2, p_2, 0)$	$1/2$	0	$(1-P(p_1))(1-p_2)$
Negatively Skewed				
	$(1/2, 1-p_2, 1)$	1	$1/2$	$(1-P(p_1))(1-p_2)$
	$(1/2, 1-p_2, 0)$	$1-p_2$	0	$(1-P(p_1))p_2$
	$(1/2, p_1, 1)$	1	p_1	$P(p_1)p_1$
	$(1/2, p_1, 0)$	$1/2$	0	$P(p_1)(1-p_1)$

Thus, the peak-trough utility function for the positively skewed structure becomes

$$\begin{aligned}
& P(p_1)(1-p_1)(.5\frac{1-\theta_H-\theta_L}{3} + (1-p_1)\frac{1-\theta_H-\theta_L}{3} + 1\frac{1-\theta_H-\theta_L}{3} + \theta_H + .5\times\theta_L) \\
+ \quad & P(p_1)\times p_1(.5\frac{1-\theta_H-\theta_L}{3} + (1-p_1)\frac{1-\theta_H-\theta_L}{3} + 0\frac{1-\theta_H-\theta_L}{3} + \theta_H\times(1-p_1) + \theta_L\times 0) \\
+ \quad & (1-P(p_1))\times p_2\times(.5\frac{1-\theta_H-\theta_L}{3} + p_2\frac{1-\theta_H-\theta_L}{3} + 1\frac{1-\theta_H-\theta_L}{3} + \theta_H + \theta_L\times p_2) \\
+ \quad & (1-P(p_1))\times(1-p_2)\times(.5\frac{1-\theta_H-\theta_L}{3} + p_2\frac{1-\theta_H-\theta_L}{3} + 0\frac{1-\theta_H-\theta_L}{3} + \theta_H\times .5 + \theta_L\times 0)
\end{aligned}$$

The utility for the negatively skewed structure is:

$$\begin{aligned}
& (1-P(p_1))(1-p_2)(.5\frac{1-\theta_H-\theta_L}{3}+(1-p_2)\frac{1-\theta_H-\theta_L}{3}+1\frac{1-\theta_H-\theta_L}{3}+\theta_H\times 1+\theta_L\times .5) \\
+ \quad & (1-P(p_1))\times p_2\times(.5\frac{1-\theta_H-\theta_L}{3}+(1-p_2)\frac{1-\theta_H-\theta_L}{3}+0\frac{1-\theta_H-\theta_L}{3}+\theta_H\times(1-p_2)+\theta_L\times 0) \\
+ \quad & P(p_1)\times p_1\times(.5\frac{1-\theta_H-\theta_L}{3}+p_1\frac{1-\theta_H-\theta_L}{3}+1\frac{1-\theta_H-\theta_L}{3}+\theta_H+\theta_L\times p_1) \\
+ \quad & P(p_1)(1-p_1)(.5\frac{1-\theta_H-\theta_L}{3}+p_1\frac{1-\theta_H-\theta_L}{3}+0\frac{1-\theta_H-\theta_L}{3}+\theta_H\times .5+\theta_L\times 0)
\end{aligned}$$

Subtracting the first from the second gives

$$\begin{aligned}
- \quad & \frac{2}{3}+0.166667\theta_L+\frac{4}{3}P(p_1)-\frac{4}{3}p_1P(p_1)-\frac{1}{3}\theta_LP(p_1)+\frac{5}{6}p_1\theta_LP(p_1)-1.p_1^2\theta_LP(p_1) \\
+ \quad & \theta_H(0.166667+(-\frac{1}{3}+\frac{5}{6}p_1-p_1^2)P(p_1)) \\
+ \quad & p_2^2(\theta_H+\theta_L-\theta_HP(p_1)-\theta_LP(p_1)) \\
+ \quad & p_2(\frac{4}{3}-\frac{5}{6}\theta_L+\theta_H(-\frac{5}{6}+\frac{5}{6}P(p_1))-\frac{4}{3}P(p_1)+\frac{5}{6}\theta_LP(p_1))
\end{aligned}$$

Given that $P(p_1)p_1+(1-P(p_1))(1-p_2)=.5$ we know that $p=\frac{-0.5+b}{a-(1-b)}$. Substituting this in gives

$$\begin{aligned}
\frac{1}{-1+p_1+p_2} \qquad & (p_1^2(0.5-1.p_2)(\theta_H+\theta_L)+p_2((0.25-0.5p_2)\theta_H+(0.25-0.5p_2)\theta_L) \\
+ \quad & p_1((-0.25+1.p_2^2)\theta_H+(-0.25+1.p_2^2)\theta_L))
\end{aligned}$$

Notice that the denominator of the fraction must always be less than 0 (because of the restrictions imposed on p_1 and p_2). Thus, in order for positive skew to be preferred to negative skew, it must be that

$$p_1^2(0.5-1.p_2)(\theta_H+\theta_L)+p_2((0.25-0.5p_2)\theta_H+(0.25-0.5p_2)\theta_L)+p_1((-0.25+1.p_2^2)\theta_H+(-0.25+1.p_2^2)\theta_L)$$

is positive. Denoting $\hat{\theta}=\theta_H+\theta_L$, we can rewrite the formula under consideration as $(p_1^2(0.5-p_2)+(0.25-0.5p_2)p_2+p_1(-0.25+p_2^2))\hat{\theta}$. We want to know under what restriction of $\hat{\theta}$ the formula is larger than 0 for any $0\le p_1<p_2<.5$. In order to derive these restrictions we consider the sign of $(p_1^2(0.5-p_2)+(0.25-0.5p_2)p_2+p_1(-0.25+p_2^2))$. When $p_1=p_2$, this becomes

$$(p_1^2(0.5-p_1)+(0.25-0.5p_1)p_1+p_1(-0.25+p_1^2))=.5p_1^2-p_1^3+.25p_1-.5p_1^2-.25p_1+p_1^3=0$$

Moreover, the derivative of $(p_1^2(0.5-p_2)+(0.25-0.5p_2)p_2+p_1(-0.25+p_2^2))$ with respect to p_1 is $-0.25+p_1(1-2p_2)+p_2^2$. For any p_2 the derivative is increasing in p_1. Note that at

$p_1 = 0$ the derivative is negative, and at $p_1 = p_2$ the derivative is $-(0.5-b)^2$ which is also negative. So the derivative is always negative for the relevant range of p_1, p_2. Since the function itself is equal to 0 at $p_1 = p_2$, this means that in the relevant range it must always be positive. Thus $(p_1^2(0.5-p_2) + (0.25-0.5p_2)p_2 + p_1(-0.25+p_2^2))$ is always positive for our range of p_1, p_2. Thus $(p_1^2(0.5-p_2) + (0.25-0.5p_2)p_2 + p_1(-0.25+p_2^2))\hat{\theta}$ is greater than 0 if and only if $\hat{\theta} = \theta_L + \theta_H$ is less than 0. □

Proposition 5. *Let $\succsim_f$ be represented by a Gateaux differentiable value function V. Then the local utility function of V is everywhere convex (concave) if and only if the decision-maker prefers Blackwell more (less) informative structures.*

Proof This is proven by Grant et al. [1998]. □