Design document for disclosure market experiment
Purpose: To study the effect of price dimensionality on consumer and producer surplus.

Experimental overview: We propose a series of studies in which participants will act as buyers or sellers. Sellers will choose the pricing structure for their product and are compensated based on profits (quantity sold x price). Buyers will choose to buy a good from one of the sellers. They are compensated based on the price paid. Markets in different experimental conditions will vary in terms of pricing dimensionality, that is, how many dimensions make up total price.

Our proposed experimental conditions are as follows:

1-Price (baseline)	Sellers will choose a single, total price. This price can vary between 0 and 800 tokens.
8-Price	Sellers will choose values for each of 8 prices. Each price can vary between 0 and 100 tokens, meaning that the total price will vary between 0 and 800.
16-Price	Sellers will choose values for each of 16 prices. Each price can vary between 0 and 50 tokens, meaning that the total price will vary between 0 and 800.

Timeline

		Repeated 3 times, with different order of conditions for each session					
Informed consent [In person, from contractor]	General instructions (applicable to all disclosure conditions)	Condition specific instructions	Practice rounds (as buyer and seller)	8 game rounds	Survey, including, risk preferences, numeracy, and basic demographics	CFPB disclosure (including meta-experiment) [In person]	Payment [In person]

Experimental detail:
- Disclosure conditions: We will run three markets per session. In each session, each market will experience all three experimental conditions. We will track the order of experimental conditions across sessions, making sure that all combinations are played.
- Market:
  - Each market will be comprised of 2 buyers and 2 sellers. Participants will be randomly assigned to a market group each round.
  - Additionally, the role of buyer and seller will be randomly selected each round.
  - All participants will be anonymous.

General Instructions (Applicable to All Disclosure Conditions and Roles)

Introduction

Values may be modified to allow for problems that arise during pretesting.

Welcome to the experiment.

[next]

[next]

Welcome to your research study.

In this study you will be playing 26 rounds of a game. Each round, you and the other participants will be assigned one of two roles: a buyer or a seller. You will be randomly reassigned to being a buyer or seller each round.

As a **seller**, you will decide on prices for an object you are trying to sell, keeping in mind you are competing with another seller for each buyer's selection.

As a **buyer**, you will decide which of two sellers' objects you want to buy.

The game is divided into 3 parts. There are different rules for each part. We will provide more instructions about each of the parts as we reach them.

 [next]

The amount you earn during this experiment will depend on the choices that you make, the choices of others, and luck. Throughout the experiment you will earn tokens. For every 3.2 tokens you earn, you will be paid 1 cent at the end of the experiment (320 tokens = $1.00).

All players will start with 500 tokens.

At the end of the experiment, your total payment will be made in cash rounded up to the nearest quarter. You will be paid in private and will have no obligation to discuss your earnings with other participants.

[next]

First, let's review what will happen. In this game, you and the other participants will be assigned to one of two roles: a buyer or seller. All roles will be reassigned each round.

Every time you play as a seller, you will be trying to sell an object which buyers can redeem at the end of a round for 800 tokens. You will choose prices for the object. You will earn more tokens when you sell more objects at a higher price.

Every time you play as a buyer, you will choose which seller's object you want to buy. You will earn more tokens when you buy an object at a lower price.

[next]

On the next few pages you will read detailed instructions for sellers and buyers. There will be new instructions after 8 rounds.

[next]

Seller instructions
Contains some condition-specific text. This text should be displayed for each participant as appropriate.

Seller Instructions Game 1

Imagine that you are playing as a seller. Each round, you will be placed into a group with two buyers and one other seller. The other seller in your group will face the same decision that you do.

1-Price condition:
As a seller, you can sell objects to earn tokens.

As a seller, you do not value the object itself, but you can sell the object to a buyer to earn tokens.

As a seller, you must choose a price for your object between 0 and 800. An example is shown in the table to the right.

For each object you sell, you will pay 100 tokens to produce the object and will receive the price you set for the object.

Therefore, if you sell to one buyer (meaning you sell one object), then using the price in the table, you will earn 587 tokens: (687 received) - (100 for production).

If you sell to both buyers (meaning you sell two objects), then using the price in the table you will receive 1174 tokens: (687 x 2 received) – (100 x 2 for production).

If you do not sell an object, then you will not receive any tokens from buyers and will not pay any tokens for production. In that case, you will earn 0 tokens.

Price 1	687

8-Price condition:
As a seller, you can sell objects to earn tokens.

As a seller, you do not value the object itself, but you can sell the object to a buyer to earn tokens.

As a seller, you must choose 8 prices for your object between 0 and 800, with the sum of the prices being less than 800. An example is shown in the table to the right.

For each object you sell, you must pay 100 tokens to produce the object. For each object you sell, you will receive the sum of 8 prices you set for the object.

Therefore, if you sell to one buyer (meaning you sell one object), then using the price in the table, you will earn 587 tokens: (687 = 91 + 100 + 83 + 57 + 92 + 96 + 69 + 99 received) - (100 for production).

If you sell to both buyers (meaning you sell two objects), then using the prices in the table you will receive 1174 tokens (587 x 2).

If you do not sell an object, then you will not receive any tokens from the buyers and will not pay any tokens to produce the object, so you will earn 0 tokens.

16-Price condition:
As a seller, you can sell objects to earn tokens.

As a seller, you do not value owning the object itself, but you can sell the object to a buyer.
As a seller, you must choose 16 prices for your object between 0 and 50. An example is shown in the table to the right.

For each object you sell, you must pay 100 tokens to produce the object. For each object you sell, you will receive the sum of 16 prices you set for the object.

Therefore, if you sell to one buyer (meaning you sell one object), then using the price in the table, you will earn 587 tokens: (687 = 49 + 50 + 38 + 40 + 32 + 42 + 39 + 50 + 47 + 50 + 48 + 36 + 23 + 50 + 50 + 43 for prices) - (100 for production).

If you sell to both buyers (meaning you sell two objects), then using the prices in the table you will receive 1174 tokens (587 x 2).

If you do not sell an object, then you will not receive any tokens from the buyers and will not pay any tokens to produce the object, so you will earn 0 tokens.

Price 1	49	Price 9	47
Price 2	50	Price 10	50

Price 3	38	Price 11	48
Price 4	40	Price 12	36
Price 5	32	Price 13	23
Price 6	42	Price 14	50
Price 7	39	Price 15	50
Price 8	50	Price 16	43

[next]

Seller comprehension check
Only display this question before round 1

Q1. Correct answer is "0 tokens"

If the answer is correct, move on to the next question. If the answer is not correct, display "Remember that you only receive tokens <u>if you sell an object</u>. If you do not sell to any buyers, you will receive <u>0</u> tokens."

SellerQ1. How many tokens will you receive if you <u>don't</u> sell an object?
___ 0 tokens
___ 800 tokens
___ It depends on the prices I set

[next]

Only display this question before round 1

Q2. Correct answer is "It depends on the prices I set"

If the answer is correct, move on to the next question. If the answer is not correct, display "Remember that you will receive tokens <u>according to the prices you set</u>. In the case of a sale, the higher the price, the more tokens you will receive."

SellerQ2. How many tokens will you receive if you sell an object?
___ 0 tokens
___ 800 tokens
___ It depends on the prices I set

[next]

Buyer instructions
Contains some condition-specific text. This text should be displayed for each participant as appropriate.

Buyer Instructions Game 1

Now imagine that you are playing as a **buyer**. Each round, you will buy an object from one of the two sellers in your group. Both sellers are selling an identical object. However, they may have chosen different prices for that object.

1-Price condition:
When you buy an object, you will receive 800 tokens minus the price. For example, if the price was set at 687, you would receive 113 tokens.

8-Price or 16-Price condition:
When you buy an object, you will receive 800 tokens minus the total price, which is equal to the sum of the prices. For example, if the prices summed to 687, you would receive 113 tokens.

[next]

Round waiting game

Round Waiting Game
Once you have made your selection, and are waiting for other buyers to finish making their choice, you will have the chance to play a game. Playing the game is optional and will not affect your compensation in any way.

Below is a preview of the game; you will get to play once we start the rounds.

Insert screenshot of game here; for review purposes, see section titled "Buyer game screen 2" below.

[next]

Round summary instructions Omit the text showing "This round, you were [role]" at the top of the screen and the profits calculation at the bottom of the screen. Format this screen with the new Round Summary format.

Round Summary Instructions for Game 1
At the end of each round, you will see a summary of what happened. Imagine that both buyer 1 and buyer 2 bought an object from Seller 2. You would see the following:

		Seller 1	Seller 2
Buyer 1: Selected object from Seller 2	Price [1-16, as appropriate]	[Set seller 1 prices to the maximum, with appropriate numbers per condition]	[Set seller 2 prices to the example given in the instructions]
Buyer 2: Selected object from Seller 2	Total Price	800	687

Your profits for this round are 1157.

1157 = 2 (sales) x (687 (total price) – 100 (production cost))

[next]

Practice Rounds
Assign participants such that everyone plays two rounds as a buyer and two rounds as a seller. Keep them in the same role continuously for these rounds.

First we will do 2 practice rounds, half as a buyer and half as a seller. You will not gain or lose any tokens during these rounds based on your decisions.

You are a [Buyer, Seller] this round.

After each round you will be given a summary of what happened in this round.

[Show same screen as the Game Rounds below].

Game Rounds
Both buyers and sellers. Repeat for 8 rounds.

Throughout, there will be text that indicates that you are waiting for the other players to finish making their choices. These text screens should disappear automatically.

Waiting for other players to begin the game…

Seller game screen
[#] represents an open text box that is pre-populated with nothing. Choose the appropriate number of prices based on condition (i.e., 1, 8, or 16).

Please enter your prices below. Each price can be from 0 to 50.

Price 1	[#]
Price 2	[#]
Price 3	[#]
Price 4	[#]
Price 5	[#]
Price 6	[#]
Price 7	[#]
Price 8	[#]
Price 9	[#]
Price 10	[#]
Price 11	[#]
Price 12	[#]
Price 13	[#]
Price 14	[#]
Price 15	[#]

Price 16	[#]	

[next]

Please wait for buyers to make their decisions…

Buyer game screen 1

Please select the seller you want to purchase from.

Your cumulative profit at the start of this round was [current tokens].

	Seller1		Seller 2
Price 1	[#]	Price 1	[#]
Price 2	[#]	Price 2	[#]
Price 3	[#]	Price 3	[#]
Price 4	[#]	Price 4	[#]
Price 5	[#]	Price 5	[#]
Price 6	[#]	Price 6	[#]
Price 7	[#]	Price 7	[#]
Price 8	[#]	Price 8	[#]
Price 9	[#]	Price 9	[#]
Price 10	[#]	Price 10	[#]
Price 11	[#]	Price 11	[#]
Price 12	[#]	Price 12	[#]
Price 13	[#]	Price 13	[#]
Price 14	[#]	Price 14	[#]
Price 15	[#]	Price 15	[#]
Price 16	[#]	Price 16	[#]

___ I want to purchase the object from Seller 1.
___ I want to purchase the object from Seller 2.

[next]

Buyer game screen 2
Once buyers have made a selection, keep them on this screen until ALL buyers have finished making a selection.

This game is based on Markey, et al. (2012). One cog will be glowing.

Please click on each glowing circle until it makes a full rotation.
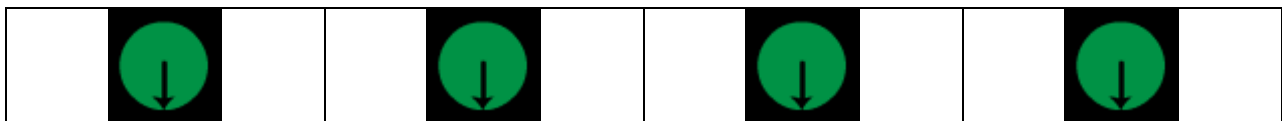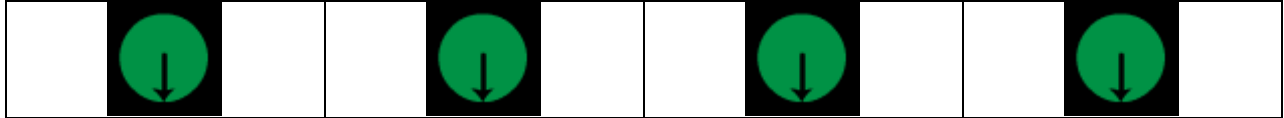
[next]

Round summary:

This round, you were [ROLE].

Seller prices:

	Seller 1	Seller 2
Price 1		
Price 2		
Price 3		
Price 4		
Price 5		
Price 6		
Price 7		
Price 8		
Total price:		

Buyer 1:
        Selected object from Seller [1/2]

Buyer 2:
        Selected object from Seller [1/2]

Your profits this round are [#]. [#] = [#] (sales) x ([#] (total price) – 100 (production cost))

 [next]

At the end of 8 rounds, re-randomize players into groups. Return to the seller and buyer instructions for the next disclosure condition.

Survey
Thank you, the games are now complete. Before we finish, we have a few questions to help us better understand how you make decisions and tradeoffs.

RiskQ1
If participant choses "50% chance...", administer RiskQ2
If they chose "100%...", administer RiskQ3
This question measures risk preferences.

RiskQ1. Hypothetically, which would you prefer: a 50% chance of getting $35, or a 100% chance of getting $15?
  ___ A 50% chance of $35
  ___ A 100% chance of $15
[next]

RiskQ2 display is contingent on RiskQ1 = "50%..."
For any response, continue to NumeracyQ1
This question measures risk preferences.

RiskQ2. Hypothetically, which would you prefer: a 50% chance of getting $35, or a 100% chance of getting $17.50?
  ___ A 50% chance of $35
  ___ A 100% chance of $17.50
[next]

RiskQ3 display is contingent on RiskQ1 response = "100%..."
For any response, continue to NumeracyQ1
This question measures risk preferences.

RiskQ3. Hypothetically, which would you prefer: a 50% chance of getting $35, or a 100% chance of getting $10?
  ___ A 50% chance of $35
  ___ A 100% chance of $10
[next]

RiskQ4. How willing are you to take risks in your life, in general?

     o   o   o   o   o
  Not at all willing   Very willing to
   to take risks   take risks

[next]

Subjective numeracy scale, as published in Fagerlin et al (2007).
For these questions, display a 6-point scale with anchors 1 = "not at all good" to 6 = "extremely good."

NumeracyQ1. How good are you at working with fractions?
  [scale]

NumeracyQ2. How good are you at working with percentages?
　　　[scale]

NumeracyQ3. How good are you at calculating a 15% tip?
　　　[scale]

NumeracyQ4. How good are you at figuring out how much a shirt will cost if it is 25% off?
　　　[scale]

[next]

For the next set, vary scale anchors.

NumeracyQ5. When reading the newspaper, how helpful do you find tables and graphs that are parts of a story?
　　　[6-point scale, 1 = "Not at all" to 6 = "Extremely"]

NumeracyQ6. When people tell you the chance of something happening, do you prefer that they use *words* ("it rarely happens") or *numbers* ("there's a 1% chance")?
　　　[6-point scale, 1 = "always prefer words" to 6 = "always prefer numbers"]

NumeracyQ7. When you hear a weather forecast, do you prefer predictions using *percentages* (e.g., "there will be a 20% chance of rain today") or predictions using only *words* (e.g., "there is a small chance of rain today")?
　　　[6-point scale, 1 = "always prefer percentages" to 6 = "always prefer words", Reverse code]

NumeracyQ8. How _often_ do you find numerical information to be useful?
　　　[6-point scale, 1 = "never" to 6 = "very often"]

[next]

Objective numeracy scale, as originally developed by Schwartz.

ObjNumQ1. Imagine that we have a fair, 6-sided die (for example, from a board game or a casino craps table). Imagine we now roll it 1000 times. Out of 1000 rolls, how many times do you think the die would come up even (numbers 2, 4, or 6)? _____

ObjNumQ2. In the Big Bucks Lottery, the chances of winning a $10.00 prize is 1%. What is your best guess about how many people would win a $10.00 prize if 1000 people each buy a single ticket to Big Bucks? _____

ObjNumQ3. In the Acme Publishing Sweepstakes, the chance of winning a car is 1 in 1000. What percentage of tickets to Acme Publishing Sweepstakes win a car? _____

[next]

Need for cognition scale, as originally developed by Cacioppo, Petty, and Kao (1984). Reverse-coded

items are presented with asterisks (*). Use the same response scale in all questions.

For each of the statements below, please indicate whether or not the statement is characteristic of you or of what you believe.

NFCQ1. I would prefer complex to simple problems.
> [5-point scale: "Extremely uncharacteristic of me," "Somewhat uncharacteristic of me," "Uncertain," "Somewhat characteristic of me," and "Extremely characteristic of me"]

NFCQ2. I like to have the responsibility of handling a situation that requires a lot of thinking.

NFCQ3. Thinking is not my idea of fun.*

NFCQ4. I would rather do something that requires little thought than something that is sure to challenge my thinking abilities.*

NFCQ5. I try to anticipate and avoid situations where there is a likely chance I will have to think in depth about something.*

NFCQ6. I find satisfaction in deliberating hard and for long hours.

NFCQ7. I only think as hard as I have to.*

NFCQ8. I prefer to think about small, daily projects to long-term ones.*

NFCQ9. I like tasks that require little thought once I've learned them.*

NFCQ10. The idea of relying on thought to make my way to the top appeals to me.

NFCQ11. I really enjoy a task that involves coming up with new solutions to problems.

NFCQ12. Learning new ways to think doesn't excite me very much.*

NFCQ13. I prefer my life to be filled with puzzles I must solve.

NFCQ14. The notion of thinking abstractly is appealing to me.

NFCQ15. I would prefer a task that is intellectual, difficult, and important to one that is somewhat important but does not require much thought.

NFCQ16. I feel relief rather than satisfaction after completing a task that requires a lot of mental effort.*

NFCQ17. It's enough for me that something gets the job done; I don't care how or why it works.*

NFCQ18. I usually end up deliberating about issues even when they do not affect me personally.

[next]

ExperienceQ. Approximately how many in-person, laboratory experiments have you completed before today? If you're not sure, please make your best guess.

        ___ 0
        ___ 1 to 3
        ___ 4 to 6
        ___ 7 to 9
        ___ 10 or more

CoursesQ. Please indicate if you have taken college-level coursework in any of the following fields. (Mark all)

        __Yes __No   Microeconomics or game theory
        __Yes __No   Marketing or business
        __Yes __No   Law

[next]

GenderQ. What is your gender?
        ___ Male
        ___ Female

EnglishQ. Is English your primary language?
        ___ Yes
        ___ No
        ___ Prefer not to answer

AgeQ. How old are you? _____ years

[next]

FutureStudiesQ. Researchers conducting this study may be interested in contacting you regarding additional research studies in the next year. These future studies will provide compensation of approximately $35/hour. Please indicate whether you would like us to contact you for these studies. Doing so will not affect any aspect of your participation today, including payment or privacy.

        ___ Yes, I would like to be contacted for future studies
        ___ No, I would not like to be contacted for future studies

[next]

Thank you for your participation today. Please wait patiently for the experimenter to call your subject number. When your number is called, gather all of your belongings, and walk to where you will be paid.

Your subject number is [subject number].

Please remember that this research is only valuable if all participants have the same experience. Therefore, please do not discuss this experiment with others outside of the lab.