

# A Slightly Used iPod and Slightly Damaged Candy: Teaching Asymmetric Information

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## 1 Goals

1. Teach students about market failure due to asymmetric information
2. Have the students experience the market failure and relate it to their everyday life
3. Make the lecture memorable to increase retention

## 2 Overview

Asymmetric information is tough to teach. Whether the class be principals, intermediate or an MBA class, we spend the first part of the semester building a world where everyone is rational and the market always operates efficiently. Asymmetric information is common. It is a large factor in used markets, insurance, and contracts; all of which a typical business student will come into contact. This lesson will warm the student up with a Big Bang Theory clip, demonstrate the concept with an experiment and then dive into the theory.

Start the lesson showing the video ‘A Slightly Used iPod’. Make sure to point out that the seller on eBay has an informational advantage. Common sense says this will lower prices as buyers have uncertainty about the quality. What you might have to point out is that there are potential sellers that would have sold their goods at the higher market price if information was symmetrical.

## 3 Demonstration

This demonstration builds on an earlier demonstration on the first day of class. In that demonstration, you hand out a variety of candy to all of the students. You then let them trade. Some group of the students will be made better of by the trade, but none will be worse off. This effectively is the same demonstration except that they don’t know the condition of the candy bar.

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### 3.1 Preparation

Prior to the class, purchase a variety of candy bars, lunch bags, Ziploc bags and (if necessary) a hammer. If the class is large, you can replace the candy bars with variety packs of cheaper candy.

Place all of the candy bars in Ziploc bags – this is to prevent a mess. Now, split the candy bars into two piles, making sure to evenly divide each type of candy.

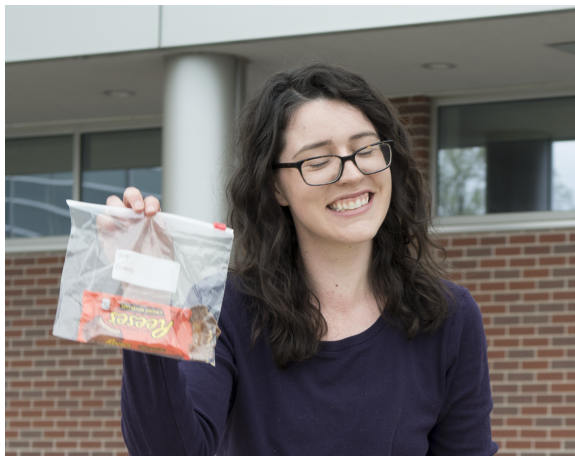


Figure 1: Jessica, a graduate assistant at UNO, very proud of the damage she did to a candy bar

Take one of the piles of candy bars outside and smash them with a hammer. Running them over with your car also works. Make sure to take pictures, you will need these for your slides. If you have a graduate assistant or TA, ask them participate (figure 1). This is cathartic activity and probably is more fun than most of the other tasks you've assigned.

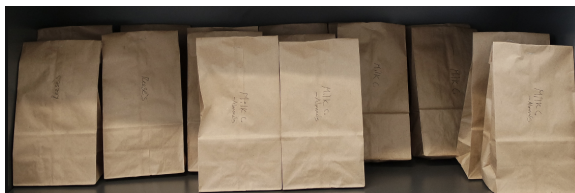


Figure 2: Labeled bags of candy bars. Some of them are damaged, some are not.

Now bag each of the smashed and undamaged candy into brown paper bags and label each bag with the type of candy (figure 2). You will also need to make a few slides showing the class that, in fact, half of the candy has been annihilated.

### 3.2 Class Day

Before handing out the bags of candy, present a couple of slides with images of the candy being destroyed. For the experiment to work, the students who receive undamaged candy must understand what happened to half of the bars. Now, tell your students that there is one rule:

You can say whatever you want to the person you are trading with, but you can't show them your candy bar.

Hand out the bags of candy and ask that anyone wanting to trade their candy come up the front of the room.

Once you have a group of willing participants in the front of the room, allow them a moment to trade. Now, ask the students in the front to pull out their candy bars. In almost all cases, every bar will be smashed. Occasionally, you might get an undamaged bar. Don't worry, just ask the student about it. They will either say that they hate that type of candy so much they weren't going to eat it anyway or that they didn't think about who would be willing to trade their candy bars (at which point the class will laugh).

Turning to the class, ask if anyone who has an undamaged candy bar doesn't particularly care for their candy. Some group of students will raise their hands. Allow them to trade candy bars while showing the other student that their candy is undamaged. This is the group of mutually beneficial trades that didn't occur because of the asymmetrical information.

## 4 Advanced Lesson

If your class is at an intermediate level or above, you can reasonably assign them Akerlof's 'Lemons' paper (Akerlof, 1970). However, you might have to walk them through the model. Place a diagram like the following on a slide:



Tell the students that car quality is uniformly distributed between 0 and 2. Those who are sellers get utility for each car equivalent to the quality ( $x_i$ ), while those who are buyers get utility for each car equivalent to the quality times  $\frac{3}{2}$  ( $\frac{3}{2}x_i$ ).  $M$  is the utility of all other goods. Thus, the utility for the sellers and buyers are:

$$\text{Sellers: } U_S = M + \sum_{i=1}^n x_i$$

$$\text{Buyers: } U_B = M + \sum_{i=1}^n \frac{3}{2}x_i$$

Now is the time to point out that if information was symmetrical, all of the sellers would happily sell to the buyers. In fact, society would be better off by  $\frac{\text{Population}}{2}$  when car quality is known to everyone. However, due to maintenance and history, tell your students to assume that only the sellers know the quality of their car.

Now move to the asymmetric information case where no trade occur. The simplest way to demonstrate this to choose a few prices. For instance, say  $P = 1$ :

1. No one below 1 will sell their car (red line)
2. Average quality will be  $\frac{1}{2}$  (blue line)

3. Expected utility of the car from the buyers' perspective  $\frac{3}{2} \frac{1}{2} = \frac{3}{4}$
4. Expected utility of buying the car is less than the price

You can walk through the same exercise with any other price. I like to use  $P = 2$  as it demonstrates that even when all the sellers are in the market, there are still no trades.

## 5 Next Steps

I like to use this lesson as a jumping off point to how agents react to a lack of information. Two options are that they voluntarily reveal the information or they use a signal.

1. Using a Cournot duopoly, have the students suppose that one of the firms doesn't know the costs of the other firm. If the 'shrouded' firm has low costs, it will be in their interest to reveal that information to the other firm. This will cause a chain reaction eventually leading to all costs being revealed. You can then relate this to how restaurants often voluntarily reveal their health ratings.
2. When the information can't be made known, you can use a signal. Here I talk about 'the value of an MBA' and walk through Spence's model (1973).

## 6 Shopping List

1. Hershey's Chocolate Full Size Variety Pack
2. Paper Lunch Bag
3. Ziploc Bags
4. 3-Pound Drilling Hammer

## 7 References

Akerlof, G. A. (1970). The market for "lemons": Quality uncertainty and the market mechanism. *The Quarterly Journal of Economics*, 488-500.

Spence, M. (1973). Job market signaling. *The Quarterly Journal of Economics*, 355-374.