

# **New Data and Experimentation**

**PHL 320  
Critical Thinking  
Distance Delivery**

## **Pink Martini Concert**

- e<sub>1</sub>.** Johnson went to a Pink Martini concert, planning to ask for a specific encore.
- e<sub>2</sub>.** “Que Sera Sera” was played during the concert.
- e<sub>3</sub>.** He never got a chance to ask for “Lily.”
- e<sub>4</sub>.** On the ride home the next morning he set his ipod to play all 36 of the Pink Martini songs.
- e<sub>5</sub>.** He set the ipod to “shuffle songs.”
- e<sub>6</sub>.** He listened to all 36 songs.
- e<sub>7</sub>.** The last two songs played were “Lily” and “Que Sera Sera” -- the imagined encore from the night before!
- e<sub>8</sub>.** “Lily” and “Que Sera Sera” are the two Pink Martini songs he listens to most often.

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- t<sub>0</sub>.** There is a glitch in the ipod software -- rather than playing the songs in completely “random” order, it is weighting things according to how often songs are listened to.

## The Odds

- Odds for being song #35
- 36 total songs
- Odds for any give spot:  $1/36$
- Odds for being song #36
- Only 35 songs left (song #36 used)
- So  $1/35$
- Encore = 35 *and* 36
- Multiplication rule:  $1/36 \times 1/35 = 1/1260$
- Second encore: same odds  $1/1260$
- Addition rule:  $1/1260 + 1/1260 = 1/630$

## Rival Explanations

- t<sub>1</sub>. This was just a true,  $1/630$ , coincidence.
- t<sub>2</sub>. This is not a software glitch; the ipod software is designed to do exactly this.
- t<sub>3</sub>. The ipod software is illegitimately weighting things, not by number of times played, but something else -- length of the songs, where they occur in the album, etc.
- t<sub>4</sub>. The philosopher set his ipod incorrectly.
- t<sub>5</sub>. The philosopher dosed in and out on the drive home and only thought that these two songs came up last.
- t<sub>6</sub>. The problem is in Johnson's ipod, the hardware, not the software.

## **Students' Ranking**

- t<sub>1</sub>. This was just a true, 1/630, coincidence.**
- t<sub>4</sub>. The philosopher set his ipod incorrectly.**
- t<sub>5</sub>. The philosopher dosed in and out on the drive home and only thought that these two songs came up last.**
- t<sub>0</sub>. Software glitch.**
- t<sub>2</sub>. This is not a software glitch; the ipod software is designed to do exactly this.**
- t<sub>3</sub>. The ipod software is illegitimately weighting things, not by number of times played, but something else -- length of the songs, where they occur in the album, etc.**
- t<sub>6</sub>. The problem is in Johnson's ipod, the hardware, not the software.**

## **Students' Evaluation**

**The evidence for Johnson's ipod glitch hypothesis is weak, since there are a number of better rival explanations of what happened on the drive home.**

## **Student Impatience**

- **Why don't you just test it?**
- **Set it up again and see if *Lily* and *Que Sera Sera* come up as the last two songs played**
- **Classic little experiment**

## **The Pretty Picture of Science**

- **Observe the world**
- **Puzzlement**
- **Form a hypothesis**
- **Devise an experiment**
- **Conduct the experiment**
- **Results of the experiment**
  - **Positive results**
  - **Negative results**

## **Logic of an Experiment**

- *If the hypothesis is correct, then we will see such and such in the experiment*
- **Conditionals - *If X, then Y***
- *Modes ponens*
- *Modes tollens*
- **Fallacy of affirming the consequent**

## **ipod experiment**

- **Devise the experiment - Lucinda Williams**
- *If I select all her songs and shuffle them, then **Right in Time** and **Essence** will be the last two played*
- **Negative result - ipod hypothesis is falsified**
- **Positive result - ipod hypothesis has survived the test**

## Reservations about the Pretty Picture

- Does a negative result really falsify?
- *Ceteris paribus* clause
- Doesn't a positive result significantly strengthen the hypothesis?
- Experimental results a new data

## Confirming the ipod Hypothesis

- e<sub>1</sub>. Johnson went to a Pink Martini concert, planning to ask for a specific encore.
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- e<sub>8</sub>. "Lily" and "Que Sera Sera" are the two Pink Martini songs he listens to most often.
- e<sub>9</sub>. Repeated the procedure with Lucinda Williams.
- e<sub>10</sub>. "Right in Time" and "Essence" were the last two songs played.
- =====
- t<sub>0</sub>. There is a glitch in the ipod software

## **Disconfirming the ipod Hypothesis**

- e<sub>1</sub>. Johnson went to a Pink Martini concert, planning to ask for a specific encore.
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  - e<sub>8</sub>. “Lily” and “Que Sera Sera” are the two Pink Martini songs he listens to most often.
  - e<sub>9</sub>. Repeated the procedure with Lucinda Williams.
  - e<sub>10</sub>. “Right in Time” and “Essence” were *not* the last two songs played.
- 
- t<sub>0</sub>. There is a glitch in the ipod software

## **Some Morals**

- Mischaracterized insight in the “pretty picture”
- Importance of experiments
- Experiments provide relevant new data
- Sometimes this data helps the original
- Sometimes it hurts
- Sometimes there’s no real change