Learn By Doing Activity

Scenario: Eyewitness Testimony

Background:

Sandra Guerra Thompson, a Professor of Law and Criminal Justice and Institute Director at the University of Houston Law Center, wrote *Beyond a Reasonable Doubt? Reconsidering Uncorroborated Eyewitness Identification Testimony*, in 2008 in the U. C. Davis Law Review.

This article reviews the overwhelming scientific evidence that establishes that eyewitnesses are notoriously inaccurate in identifying strangers, especially under the conditions that exist in many serious offenses such as robbery. Many of the factors that tend to decrease the accuracy of an identification are intrinsic to a witness' abilities, and not the product of inappropriate suggestion by the police.

We know, for example, that eyewitnesses identify a known wrong person (a "filler" or "foil") in approximately 20% of all real criminal lineups.

Using the data that 20% of eyewitnesses identify a **known wrong person**, we wish to create a probability distribution and answer some probability questions.

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Suppose we have three randomly selected lineups. Let I represent an incorrect identification. Note: The complement of I is that an incorrect identification has not occurred. This means that in any randomly selected lineup either the correct person or nobody was identified. In either case nothing incorrect has happened. So, for simplicity, let C represent the complement of I.What is the sample space for this experiment?

Your Answer:

CCC, CCI, CIC, ICC, CII, ICI, IIC, III

Our Answer:
Each outcome for each trial is either an "I" or a "C." We have three trials. Thus, the sample space is: III, IIC, ICI, ICC CII, CIC, CCI, and CCC

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Using the sample space you found in the previous question:Find the probability for each element in the sample space.

Your Answer:

CCC = 0.8 * 0.8 * 0.8
CCI = 0.8 * 0.8 * 0.2
CIC = 0.8 * 0.2 * 0.8
ICC = 0.2 * 0.8 * 0.8
CII = 0.8 * 0.2 * 0.2
ICI = 0.2 * 0.8 * 0.2

Our Answer:
P(I) = 0.20. Since C is the complement of I, P(C) = 0.80. P(III) = (0.20) (0.20) (0.20) = 0.008 P(IIC) = (0.20) (0.20) (0.80) = 0.032 P(ICI) = (0.20) (0.80) (0.20) = 0.032 P(ICC) = (0.20) (0.80) (0.80) = 0.128 P(CII) = (0.80) (0.20) (0.20) = 0.032 Similarly, P(CIC) = 0.128, P(CCI) = 0.128, and P(CCC) = 0.512.

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Using the probabilities you found in the previous question: Let X represent a discrete random variable that counts the number of incorrect identifications. Create the probability distribution.

Your Answer:

x = 0, 1, 2, 3 [incorrect identifications]
P(X=x) = 0.512, 0.384, 0.096, 0.08

Our Answer:

Notice that one of the elements of the sample space has 0 Is, some have 1 I, some have 2 Is, and one has 3 Is. When X = 0 we have CCC. Thus, P(X = 0) = 0.512. When X = 1 we have ICC, CIC, and CCI. All of these had the same probability. Thus, P(X = 1) = 3(0.128), or 0.384. When X = 2, we have IIC, ICI, and CII. All of these had the same probability. Thus, P(X = 2) = 3(.032) or 0.096. Last, when X = 3, we have III. Thus, P(X = 3) = 0.008. The sum of these probabilities is indeed 1: 0.512 + 0.384 + 0.096 + 0.008 = 1. This is summarized in the table below:

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Now we wish to find some probabilities using the probability distribution you just created. Find P(at least one identification is incorrect).

Your Answer:

0.488

Our Answer:

At least one means P(X ≥ 1). So X can be 1, 2, or 3. This means the probability is 0.384 + 0.096 + 0.008 = 0.488. Using complements P(X ≥ 1) = 1 = P(X = 0) or 1 - 0.512, which is also 0.488.

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Find P(more than 2 identifications are incorrect).

Your Answer:

0.008

Our Answer:

The only value for X that is more than 2 is 3. P(X = 3) = 0.008.

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Learn By Doing (1/1 point)

Find P(no more than one identification is incorrect).

Your Answer:

0.896

Our Answer:

The values for X that are no more than one are 0 and 1. P(no more than one identification is incorrect) = P(X = 0) + P(X = 1) = 0.512 + 0.384, or 0.896.

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