SOC 4015/5050: Lecture 04 Equations

Christopher Prener, Ph.D.

Fall 2018

Additive Law

$$P(A \cup B) = P(A) + P(B) - P(A \cap B) \tag{1}$$

Conditional Probability

$$P(A|B) = \frac{P(A \cap B)}{P(B)} \tag{2a}$$

$$P(B|A) = \frac{P(A \cap B)}{P(A)} \tag{2b}$$

Multiplicative Law

$$P(A \cap B) = P(A) * P(B|A) \tag{3}$$

Independence

$$P(A \cap B) = P(A) * P(B) \tag{4}$$

Bayes' Theorem

The posterior probability can be calculated using this simplified formula:

$$\frac{xy}{xy + z(1-x)} \tag{5}$$