**CHAPTER 1 GLOSSARY**

**3S strategy** A framework for evaluating the strength of evidence against the chance model (null hypothesis). The 3S’s are statistic, simulate, and strength of evidence.

**alternative hypothesis** The not by chance or there is an effect explanation, it is typically our research conjecture.

**bar graph** A graphical display of the distribution of a categorical variable.

**binary variable** Categorical variable with only two outcomes.

**central limit theorem** A mathematical prediction of the behavior of the null distribution when certain validity conditions are met.

**chance models** A real or computerized process to generate data according to a well-understood set of conditions.

**expected number of failures** How many failures we expect to occur for a given sample size and can be calculated by multiplying the sample size by one minus the probability of success (that is, n(1 − π).

**expected number of successes** How many successes we expect to occur for a given sample size and can be calculated by multiplying the sample size by the probability of success (that is, nπ).

**Model** A mathematical or probabilistic conceptualization meant to closely match reality but always making assumptions about the reality which may or may not be true.

**n** A symbol used to indicate the sample size.

**normally distributed** How the null distribution is described when it takes the shape of a bell.

**null distribution** Distribution of simulated statistics that represent what could have happened in the study assuming the null hypothesis was true.

**null hypothesis** The by chance alone or no effect explanation; a hypothesis that can be modeled by simulation.

**one-proportion z-test** The theory-based approach for inference for a single proportion.

**Parameter** For a random process a parameter is a longrun numerical property of the process.

**pi (π)** The Greek letter for p, which is pronounced “pie” and is used to represent a parameter that is a probability.

 $\hat{p} $The proportion of observational units that have a particular characteristic based on a measured variable; a statistic

**Plausible** A term used to indicate that the chance model is a reasonable/believable explanation for the data we observed.

**p-value** The probability of obtaining a value of the statistic at least as extreme as the observed statistic when the null hypothesis is true.

**Sample** The set of observed values.

**sample size** The number of observational units in the sample.

**sampling distribution of a sample proportion** The theoretical distribution of sample proportions from all possible sample of the same size, n, from a long-run process (or population) with a population proportion of success of π.

**significance level** The value used as a criterion for deciding how small a p-value needs to be to provide convincing evidence to reject the null hypothesis.

 To standardize an observation, compute the distance of the observation from the mean and divide by the standard deviation of the distribution.

**Statistic** A number computed from the sample.

**statistically significant** Unlikely to occur just by random chance.

**Strength** How much evidence we have against the null hypothesis.

**Subjects** Study participants that are human.

**test of significance** A procedure for measuring the strength of evidence against a null hypothesis about the parameter of interest.

**theory-based approach** Mathematical approach which predicts the shape, center, and variability of the null distribution instead of obtaining a null distribution by simulating.

**two-sided test** Estimates the p-value by considering results that are at least as extreme as our observed result in either direction.

**validity conditions** Check to see that certain conditions are met that render the theory-based approach valid. Often these conditions deal with sample size and shape and variability of null distributions.

**z-statistic** Synonymous with standardized sample proportion, also called the standardized statistic. (Tintle, 05/2018, p. 86)*Tintle, N., Carver, R. E., Chance, B. L., Cobb, G. W., Rossman, A. J., Roy, S., Swan, T. (05/2018). Introduction to Statistical Investigations, AP Edition, Enhanced eText [VitalSource Bookshelf version]. Retrieved from vbk://9781119503477*