

In a study of children with a particular disorder, parents were asked to rate their child on a variety of items related to how well their child performs different tasks. One item was "Has difficulty organizing work," rated on a five-point scale of 0 to 4 with 0 corresponding to "not at all" and 4 corresponding to "very much." The mean rating for 282 boys with the disorder was reported as 2.34 with a standard deviation of 1.12. (Round your answers to four decimal places.)

Compute the 90% confidence interval.

([] , [])

Compute the 95% confidence interval.

([] , [])

Compute the 99% confidence interval.

([] , [])

Explain the effect of the confidence level on the width of the interval.

- We see that the width of the interval does not change with confidence level.
- We see that the width of the interval decreases with confidence level.
- We see that the width of the interval increases with confidence level.

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Feb 28 9:20AM		Received	1882097197	0:00	0	No fax

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Feb 28 2018 9:21AM
 984-6082581
 lisa.knight@smith.com
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Mar 1	12:59PM	Received	14012974875	0:00	0	No fax

- The results for this sample will generalize well to all other areas of the country.
- The results for this sample may not generalize well to other areas of the country.

(f) The women in this study were all residents of Durham, North Carolina. To what extent do you think the results can be generalized to other populations?

([] , [])

(e) Find a 95% confidence interval for the difference between the two means. Compare the information given by the interval with the information given by the significance test.

- We do not reject H_0 and conclude that the intervention had no significant effect on test scores.
- We reject H_0 and conclude that the intervention increased test scores.

Write a short summary of your conclusion.

t =

df =

P-value =

(d) Carry out the significance test using a one-sided alternative. Report the test statistic with the degrees of freedom and the P-value. (Round your test statistic to three decimal places, your degrees of freedom to the nearest whole number and your P-value to four decimal places.)

- The two-sided alternative reflects the researchers' (presumed) belief that the intervention would increase scores on the test. The one-sided alternative allows for the possibility that the intervention might have had a negative effect.
- The one-sided alternative reflects the researchers' (presumed) belief that the intervention would decrease scores on the test. The two-sided alternative allows for the possibility that the intervention might have had a positive effect.
- The two-sided alternative reflects the researchers' (presumed) belief that the intervention would increase scores on the test. The two-sided alternative allows for the possibility that the intervention might have had a negative effect.
- The one-sided alternative reflects the researchers' (presumed) belief that the intervention would decrease scores on the test. The two-sided alternative allows for the possibility that the intervention might have had a positive effect.
- The one-sided alternative reflects the researchers' (presumed) belief that the intervention would increase scores on the test. The two-sided alternative allows for the possibility that the intervention might have had a negative effect.
- The two-sided alternative reflects the researchers' (presumed) belief that the intervention would decrease scores on the test. The two-sided alternative allows for the possibility that the intervention might have had a positive effect.

Some people would prefer a two-sided alternative in this situation while others would use a one-sided significance test. Give reasons for each point of view.

- $H_0: \mu_{\text{Intervention}} \neq \mu_2; H_a: \mu_{\text{Intervention}} < \mu_{\text{Control}}$ (or $\mu_{\text{Intervention}} = \mu_{\text{Control}}$)
- $H_0: \mu_{\text{Intervention}} \neq \mu_2; H_a: \mu_{\text{Intervention}} > \mu_{\text{Control}}$ (or $\mu_{\text{Intervention}} = \mu_{\text{Control}}$)
- $H_0: \mu_{\text{Intervention}} = \mu_2; H_a: \mu_{\text{Intervention}} < \mu_{\text{Control}}$ (or $\mu_{\text{Intervention}} = \mu_{\text{Control}}$)
- $H_0: \mu_{\text{Intervention}} = \mu_2; H_a: \mu_{\text{Intervention}} > \mu_{\text{Control}}$ (or $\mu_{\text{Intervention}} = \mu_{\text{Control}}$)
- $H_0: \mu_{\text{Intervention}} \neq \mu_2; H_a: \mu_{\text{Intervention}} < \mu_{\text{Control}}$ (or $\mu_{\text{Intervention}} = \mu_{\text{Control}}$)

Self-efficacy is a general concept that measures how well we think we can control different situations. A multimedia program designed to improve dietary behavior among low-income women was evaluated by comparing women who were randomly assigned to intervention and control groups. Participants were asked, "How sure are you that you can eat foods low in fat over the next month?" The response was measured on a five-point scale with 1 corresponding to "not sure at all" and 5 corresponding to "very sure." Here is a summary of the self-efficacy scores obtained about 2 months after the intervention:

Group	n	\bar{x}	s
Intervention	167	4.18	1.19
Control	214	3.63	1.12

(a) Do you think that these data are Normally distributed? Explain why or why not.

- The distribution is Normal because the standard deviation is smaller than the mean.
- The distribution is not Normal because all scores are integers.
- The distribution is Normal because the sample was randomly assigned.
- The distribution is not Normal because the sample included only women.
- The distribution is Normal because the sample sizes are large.

(b) Is it appropriate to use the two-sample t procedures that we studied in this section to analyze these data? Give reasons for your answer.

- The t procedures should be appropriate because we have two large samples with no outliers.
- The t procedures should not be appropriate because the two groups are different sizes.
- The t procedures should be appropriate because we have Normally distributed data.
- The t procedures should not be appropriate because we do not have Normally distributed data.
- The t procedures should not be appropriate because the sample sizes are not large enough.

(c) Describe appropriate null and alternative hypotheses.

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To what extent do syntax textbooks, which analyze the structure of sentences, illustrate gender bias? A study of this question sampled sentences from 10 texts. One part of the study examined the use of the words "girl," "boy," "man," and "woman." We will call the first two words *juvenile* and the last two *adult*. Is the proportion of female references that are juvenile (girl) equal to the proportion of male references that are juvenile (boy)? Here are data from one of the texts:

Gender	n	X (juvenile)
Female	59	47
Male	134	52

(a) Find the proportion of juvenile references for females and its standard error. Do the same for the males. (Round your answers to three decimal places.)

$\hat{p}_F =$

$SE_{\hat{p}_F} =$

$\hat{p}_M =$

$SE_{\hat{p}_M} =$

(b) Give a 90% confidence interval for the difference. (Do not use rounded values. Round your final answers to three decimal places.)

$($, $)$

(c) Use a test of significance to examine whether the two proportions are equal. (Use $\hat{p}_F - \hat{p}_M$. Round your value for z to two decimal places and round your P -value to four decimal places.)

$z =$

P -value =

State your conclusion.

There is not sufficient evidence to conclude that the two proportions are different.
 There is sufficient evidence to conclude that the two proportions are different.

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Mar 01 2018 5:48PM
 804-8082281
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Castaneda v Partida is an important court case in which statistical methods were used as part of a legal argument. When reviewing this case, the Supreme Court used the phrase "two or three standard deviations" as a criterion for statistical significance. This Supreme Court review has served as the basis for many subsequent applications of statistical methods in legal settings. (The two or three standard deviations referred to by the Court are values of the z statistic and correspond to P-values of approximately 0.05 and 0.0026.) *In Castaneda* the plaintiffs alleged that the method for selecting juries in a county in Texas was biased against Mexican Americans. For the period of time at issue, there were 181,775 persons eligible for jury duty, of whom 142,475 were Mexican Americans. Of the 898 people selected for jury duty, 334 were Mexican Americans.

(a) What proportion of eligible voters were Mexican Americans? Let this value be p_0 . (Round your answer to four decimal places.)

(b) Let p be the probability that a randomly selected juror is a Mexican American. The null hypothesis is to be tested is $H_0: p = p_0$. Find the value of \hat{p} for this problem, compute the z statistic, and find the P-value. What do you conclude? (A finding of statistical significance in this circumstance does not constitute a proof of discrimination. It can be used, however, to establish a prima facie case. The burden of proof then shifts to the defense.) (Use $\alpha = 0.01$. Round your test statistic to two decimal places and your P-value to four decimal places.)

P-value

z

Conclusion

- Reject the null hypothesis, there is significant evidence that Mexican Americans are underrepresented on juries.
- Reject the null hypothesis, there is not significant evidence that Mexican Americans are underrepresented on juries.
- Fail to reject the null hypothesis, there is not significant evidence that Mexican Americans are underrepresented on juries.
- Fail to reject the null hypothesis, there is significant evidence that Mexican Americans are underrepresented on juries.

(c) We can reformulate this exercise as a two-sample problem. Here we wish to compare the proportion of Mexican Americans among those selected as jurors with the proportion of Mexican Americans among those not selected as jurors. Let p_1 be the probability that a randomly selected juror is a Mexican American, and let p_2 be the probability that a randomly selected nonjuror is a Mexican American. Find the z statistic and its P-value. (Use $\alpha = 0.01$. Round your test statistic to two decimal places and your P-value to four decimal places.)

P-value

z

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Mar 03 2018 2:50PM

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Mar 3, 2018	2:50PM	Received	10848881288	0:00	0	No fax

none of the above

very similar

very different

How do your answers compare with your results in (b)?

Reject the null hypothesis, there is significant evidence of a difference in proportions.

Reject the null hypothesis, there is not significant evidence of a difference in proportions.

Fail to reject the null hypothesis, there is not significant evidence of a difference in proportions.

Fail to reject the null hypothesis, there is significant evidence of a difference in proportions.

Conclusion

A matched pairs experiment compares the taste of instant with fresh-brewed coffee. Each subject tastes two unmarked cups of coffee, one of each type, in random order and states which he or she prefers. Of the 80 subjects who participate in the study, 28 prefer the instant coffee. Let p be the probability that a randomly chosen subject prefers fresh-brewed coffee to instant coffee. (In practical terms, p is the proportion of the population who prefer fresh-brewed coffee.)

- (a) Test the claim that a majority of people prefer the taste of fresh-brewed coffee. Report the large-sample z statistic. (Round your answer to two decimal places.)

Report its P -value. (Round your answer to four decimal places.)

- (b) Draw a sketch of a standard Normal curve and mark the location of your z statistic. Shade the appropriate area that corresponds to the P -value.

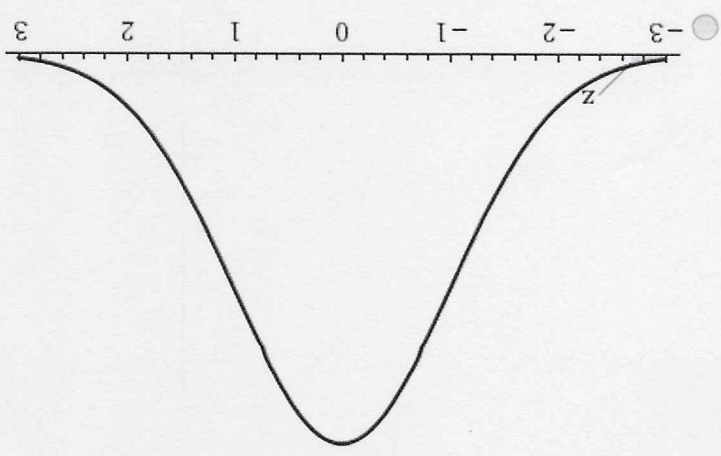
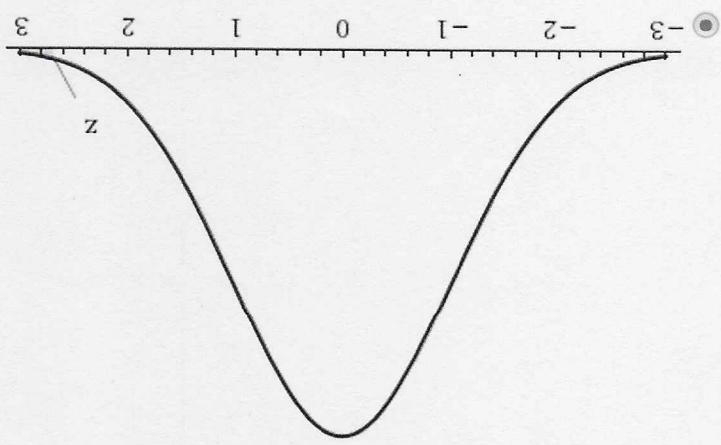
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Mar 3 3:43PM		Received	10648888804	00:00	0	No fax

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 las.knight@unh.edu
 603-888-8881
 Mar 03 2018 3:43PM

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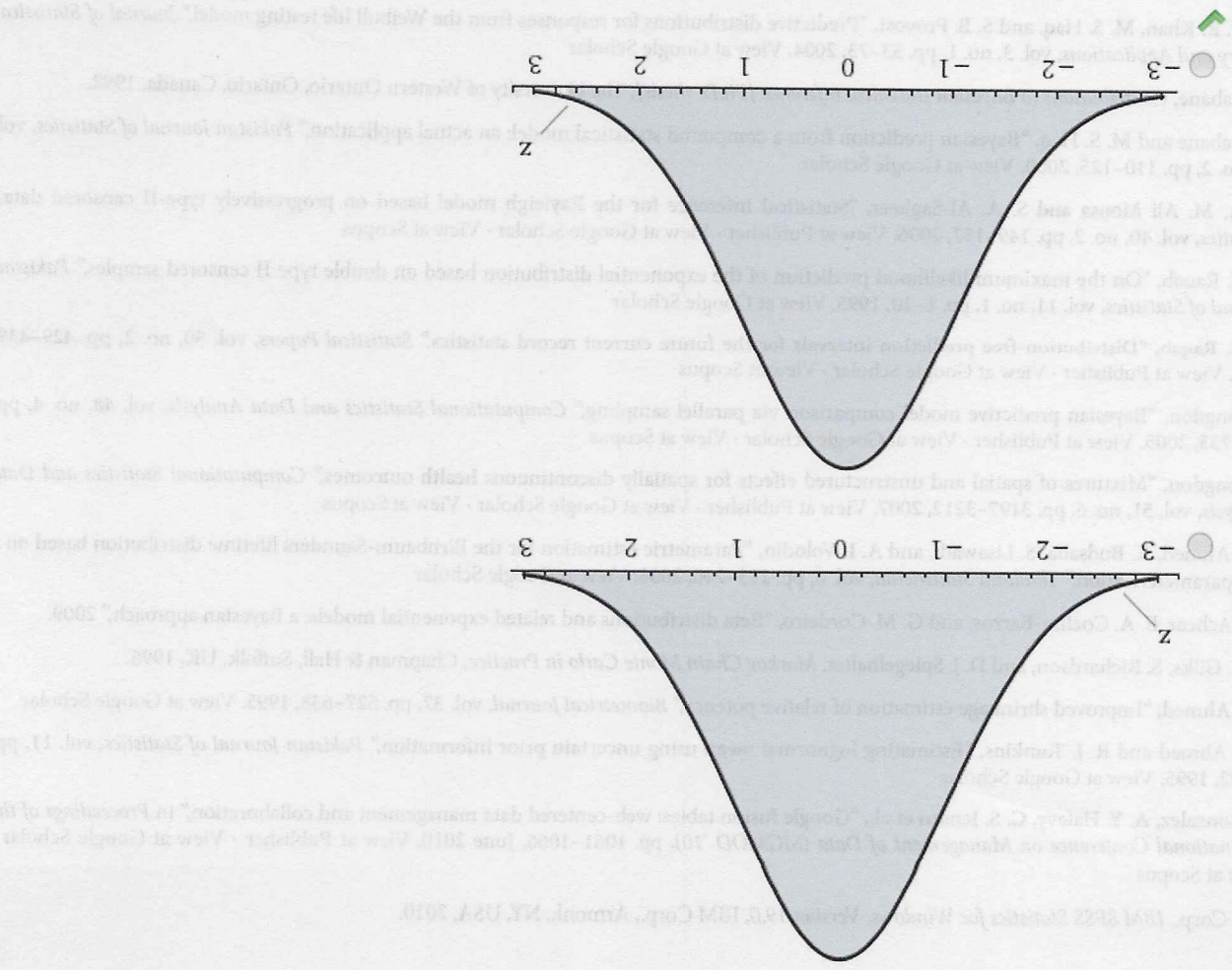
22. A. K. Gupta, "Parameterization and Bayesian modeling," *Journal of the American Statistical Association*, vol. 90, no. 406, pp. 517-543, 2004. View at Publisher · View at Google Scholar · View at Scopus

What is your practical conclusion?

Yes

No

(c) Is your result significant at the 5% level?



28. - /0.69 points MintroStat9 8.E.040.

27. - /0.69 points MintroStat9 8.E.503.XP.

participants

whole number.)

What sample size would you use if you wanted the 95% margin of error to be 0.3 or less? (Round your answer up to the next

5, "definitely would purchase." For an initial analysis, you will record the responses 1, 2, and 3 as "No" and 4 and 5 as "Yes."

indicating "definitely would not purchase"; 2, "probably would not purchase"; 3, "not sure"; 4, "probably would purchase"; and

your customers and ask whether or not there is interest in the new product. The response is on a 1 to 5 scale with 1

One of your employees has suggested that your company develop a new product. You decide to take a random sample of

Upper limit

Lower limit

population who are pet owners. (Round your answers to three decimal places.)

owned a pet, while 1922 reported that they did not. Give a 98% confidence interval for the proportion of older adults in this

In a study of the relationship between pet ownership and physical activity in older adults, 585 subjects reported that they

- The result is significant at the 5% level, so we reject H_0 and conclude that a majority of people prefer instant coffee.
- The result is not significant at the 5% level, so we do not reject H_0 and conclude that a majority of people prefer instant coffee.
- The result is significant at the 5% level, so we reject H_0 and conclude that a majority of people prefer fresh-brewed coffee.
- The result is not significant at the 5% level, so we do not reject H_0 and conclude that a majority of people prefer fresh-brewed coffee.
- The result is significant at the 5% level, so we reject H_0 and conclude that a majority of people prefer instant coffee.
- The result is not significant at the 5% level, so we do not reject H_0 and conclude that a majority of people prefer instant coffee.
- The result is significant at the 5% level, so we reject H_0 and conclude that a majority of people prefer fresh-brewed coffee.

An automobile manufacturer would like to know what proportion of its customers are dissatisfied with the service received from their local dealer. The customer relations department will survey a random sample of customers and compute a 95% confidence interval for the proportion that are dissatisfied. From past studies, it believes that this proportion will be about 0.26. Find the sample size needed if the margin of error of the confidence interval is to be no more than 0.045. (Round your answer up to the next whole number.)

customers

The following table presents the mean, standard error, and predictive intervals for binary survival data as given in Table 2. The predictive model characteristics, raw moments, centered moments, and measures of skewness and kurtosis are also presented in Table 2. These findings are very important for health care researchers to characterize future patients and to make an effective future plan for

Figure 5: The predictive density for a single future response for black Hispanic survival data.

Figure 7 shows the graphical representation of the predictive density based on the black Hispanic female breast cancer patients' survival data. It is noted that the predictive density formed right skewed model.

where $V_0(x)$ is a normalizing constant.

$$p(x|y) = \int_{-\infty}^{\infty} p(x|\alpha, \lambda) p(\alpha, \lambda | x) d\alpha d\lambda$$

where $p(x|\alpha, \lambda)$ may be defined from model (1). Then the predictive density for a single future response is given by

$$p(x|x) = \begin{cases} \frac{V_0(x) \left[\int_{-\infty}^{\infty} \int_{-\infty}^{\infty} \alpha^2 \lambda^{2\alpha} \exp\left\{-\sum_{i=1}^n \lambda x_i - \lambda\right\} \times \exp\left\{-\sum_{i=1}^n \lambda x_i - \lambda\right\} \times \prod_{i=1}^n (1 - \exp\{-\lambda x_i\})^{n-1} d\lambda d\alpha \right]}{V_0(x) \left[\int_{-\infty}^{\infty} \int_{-\infty}^{\infty} \alpha^2 \lambda^{2\alpha} \exp\left\{-\sum_{i=1}^n \lambda x_i - \lambda\right\} \times \exp\left\{-\sum_{i=1}^n \lambda x_i - \lambda\right\} \times \prod_{i=1}^n (1 - \exp\{-\lambda x_i\})^{n-1} d\lambda d\alpha \right]} \end{cases}$$

for $x > 0$, $\alpha, \lambda > 0$,
 elsewhere.

Let x be a single future response from the model specified by (1), where x is independent of the observed data. Then the predictive density for a single future response (a given $x = (x_1, \dots, x_n)$) is

4.1. Predictive density for a single future response

where $V_0(x)$ is a normalizing constant.

Considering the prior density in (2), the posterior density of α and λ is given by

$$p(\alpha, \lambda | x) = V_0(x) \exp\left\{-\sum_{i=1}^n \lambda x_i - \lambda\right\} \times \prod_{i=1}^n (1 - \exp\{-\lambda x_i\})^{n-1}$$

Then the joint prior density is

$$p(\alpha) \propto \frac{1}{\alpha}, \quad \alpha > 0$$

With reference from Khan et al. (22), the shape parameter, α , has a gamma prior over the interval $(0, \infty)$, which is given as follows

$$p(\lambda) \propto \lambda \exp\{-\lambda\}, \quad \lambda > 0.$$

In this exercise we examine the effect of the sample size on the significance test for comparing two proportions. In each case suppose that $p_1 = 0.65$ and $p_2 = 0.45$, and take n to be the common value of n_1 and n_2 . Use the z statistic to test

$H_0: p_1 = p_2$ versus the alternative $H_a: p_1 \neq p_2$. Compute the statistic and the associated P -value for the following values of

n : 40, 50, 60, 80, 380, 480, and 980. Summarize the results in a table. (Test the difference $p_1 - p_2$. Round your values for z to

two decimal places and round your P -values to four decimal places.)

n	z	P -value
40		
50		
60		
80		
380		
480		
980		

Explain what you observe about the effect of the sample size on statistical significance when the sample proportions p_1

and p_2 are unchanged.

- As sample size increases, the test becomes less significant.
- As sample size increases, the test becomes more significant.
- As sample size increases, there is no effect on significance.
- There is not enough information.

We have studied the effect of the sample size on the margin of error of the confidence interval for a single proportion. In this exercise we perform some calculations to observe this effect for the two-sample problem. Suppose that $p_1 = 0.7$ and $p_2 = 0.5$, and n represents the common value of n_1 and n_2 . Compute the 95% margins of error for the difference between the two proportions for $n = 50, 60, 70, 90, 390, 490$, and 990 . Present the results in a table. (Give the large-sample margins of error. Round your answers to three decimal places.)

n	m
50	<input type="text"/>
60	<input type="text"/>
70	<input type="text"/>
90	<input type="text"/>
390	<input type="text"/>
490	<input type="text"/>
990	<input type="text"/>

Table 7: Summary of the posterior parameters in the case of BW for Black Hispanic female breast cancer patients ($n = 298$).
 Table 8: Summary of the posterior parameters in the case of BCE for Black Hispanic female breast cancer patients ($n = 298$).
 Table 9: Summary of the posterior parameters for exponential Weibull for Black Hispanic female breast cancer patients ($n = 298$).
 Table 10: Summary of the posterior parameters from exponential exponential for Black Hispanic female breast cancer patients ($n = 298$).
 Table 11: Selection of the best model for Black Hispanic female on the basis of AIC, BIC, and DIC criterion.

$$\sum_{i=1}^n \log(x_i) + (n-1) \times \left(\left(1 - \exp(-\lambda x_i) \right)^{\alpha} \right)$$

A better performance of the posterior distributions for the parameters can be achieved with the reparameterization method. Table 7 gives the results of the measure of goodness of fit for Black Hispanic female. Tables 8-11 summarize the results of the posterior parameters. Figure 3-4 shows the posterior interval densities for the parameters.

Assume $p_1 = \log(b)$, $p_2 = \log(a)$, $p_3 = \log(c)$, and $p_4 = \log(d)$. We further assume that p_1, p_2, p_3 , and p_4 are independently distributed. To obtain noninformative priors for p_1, p_2, p_3 , and p_4 , let a uniform prior distribution for p_i be $U(-b_i, b_i)$, for all $i = 1, 2, 3, 4$. Then the joint posterior density is given by

$$p(p_1, p_2, p_3, p_4 | x) = \frac{1}{(2b_1 2b_2 2b_3 2b_4)} \times \left[n \log \left(\frac{e^{p_1}}{B(e^{p_1}, e^{p_2})} \right) - e^{p_1} \sum_{i=1}^n x_i + (e^{p_1} - 1) \right]$$

(8)

$$\times \sum_{i=1}^n \log(1 - \exp(-e^{p_2} x_i)) (e^{p_2} - 1) \times \left(\sum_{i=1}^n \log(1 - (1 - \exp(-e^{p_3} x_i))^{e^{p_3}}) \right)$$

The log-likelihood function from the RW model is given by

$$l(p_1, p_2, p_3, p_4 | x) = n \log(p_1) - n \log(p_2) - n \log(p_3) + n \log(p_4) + (p_1 - 1) \sum_{i=1}^n \log(1 - \exp(-e^{p_2} x_i)) - e^{p_1} \sum_{i=1}^n x_i + (e^{p_1} - 1) \sum_{i=1}^n \log(1 - (1 - \exp(-e^{p_3} x_i))^{e^{p_3}})$$

(9)

Assume $p_1 = \log(b)$, $p_2 = \log(a)$, $p_3 = \log(c)$, and $p_4 = \log(d)$. We further assume that p_1, p_2, p_3 , and p_4 are independently distributed. To obtain noninformative priors for p_1, p_2, p_3 , and p_4 , let a uniform prior distribution for p_i be $U(-b_i, b_i)$, for all $i = 1, 2, 3, 4$. Then the joint posterior density is derived by

$$p(p_1, p_2, p_3, p_4 | x) = \frac{1}{(2b_1 2b_2 2b_3 2b_4)} \times \exp \left[n \log(p_1) - n \log(p_2) - n \log(p_3) + n \log(p_4) + (p_1 - 1) \sum_{i=1}^n \log(1 - \exp(-e^{p_2} x_i)) - e^{p_1} \sum_{i=1}^n x_i + (e^{p_1} - 1) \sum_{i=1}^n \log(1 - (1 - \exp(-e^{p_3} x_i))^{e^{p_3}}) \right]$$

(10)

The log-likelihood function from the RW model is given by

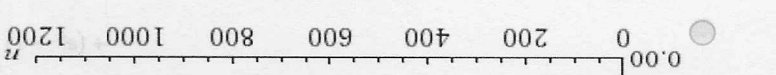
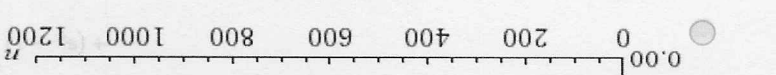
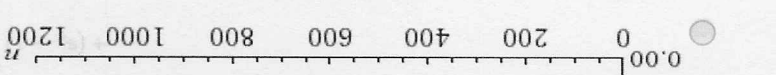
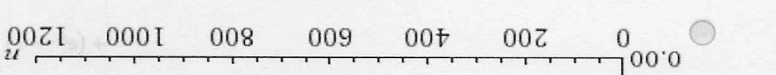
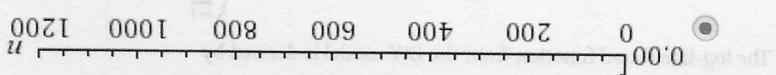
$$l(p_1, p_2, p_3, p_4 | x) = n \log(p_1) - n \log(p_2) - n \log(p_3) + n \log(p_4) + (p_1 - 1) \sum_{i=1}^n \log(1 - \exp(-e^{p_2} x_i)) - e^{p_1} \sum_{i=1}^n x_i + (e^{p_1} - 1) \sum_{i=1}^n \log(1 - (1 - \exp(-e^{p_3} x_i))^{e^{p_3}})$$

(11)

Assume $p_1 = \log(b)$, $p_2 = \log(a)$, $p_3 = \log(c)$, and $p_4 = \log(d)$. We further assume that p_1, p_2, p_3 , and p_4 are independently distributed. To obtain noninformative priors for p_1, p_2, p_3 , and p_4 , let a uniform prior distribution for p_i be $U(-b_i, b_i)$, for all $i = 1, 2, 3, 4$. Then the joint posterior density is given by

$$p(p_1, p_2, p_3, p_4 | x) = \frac{1}{(2b_1 2b_2 2b_3 2b_4)} \times \exp \left[n \log(p_1) - n \log(p_2) - n \log(p_3) + n \log(p_4) + (p_1 - 1) \sum_{i=1}^n \log(1 - \exp(-e^{p_2} x_i)) - e^{p_1} \sum_{i=1}^n x_i + (e^{p_1} - 1) \sum_{i=1}^n \log(1 - (1 - \exp(-e^{p_3} x_i))^{e^{p_3}}) \right]$$

(12)



In the Health ABC Study 533 subjects owned a pet and 1963 subjects did not. Among the pet owners, there were 302 women; 975 of the non-pet owners were women. Find the proportion of pet owners who were women. Do the same for the non-pet owners. (Be sure to let Population 1 correspond to the group with the higher proportion so that the difference will be positive. Round your answers to three decimal places.)

$p_1 =$

$p_2 =$

Give a 95% confidence interval for the difference in the two proportions. (Do not use rounded values. Round your final answers to three decimal places.)

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3. Real Life Example

The structural equation of this paper is as follows: Section 1 includes a real example of breast cancer data discussed in detail. Section 2 includes the amount of goodness of fit test, log-likelihood function, and the posterior inference for the model parameters. The Bayesian inference model which includes the likelihood function, prior density function, and the posterior density for a data response given a set of observations from the model. Section 3 includes the results and discussion, and Section 4 includes the conclusion.

The structural equation of this paper is as follows: Section 1 includes a real example of breast cancer data discussed in detail. Section 2 includes the amount of goodness of fit test, log-likelihood function, and the posterior inference for the model parameters. The Bayesian inference model which includes the likelihood function, prior density function, and the posterior density for a data response given a set of observations from the model. Section 3 includes the results and discussion, and Section 4 includes the conclusion.

A novel Bayesian method can be used to derive the posterior probability for the parameters to calculate posterior inference. Model parameters and data are considered random variables in a Bayesian estimation technique. Their joint probability distribution is stated by a probabilistic model. Data are considered as "observed variables" and parameters as "unobserved variables" in a Bayesian method. Identifying likelihood and prior gives the joint distribution for the parameters. The "prior" contains information about the parameter. The likelihood depends on the model of underlying process and measured as a conditional distribution which specifies the probability of the observed data. All the information available about the parameter is combined by prior and likelihood. By considering the joint distribution of prior and likelihood, inference about parameters of the probability model can be derived from the given data. The Bayesian inference intends to develop the posterior distribution of the parameters for given sets of observed data.

$$p(x) = \frac{L(x|\theta) \pi(\theta)}{\int L(x|\theta) \pi(\theta) d\theta}$$

The BIV model has several applications for problems in engineering, health, and medical fields. It shows best fit for several data sets for instance. The amount of time taken for breakdown of insulating joints subjected to fatigue [1]. For the BIV model, the probability density function (pdf) is given by:

A survey of internet users reported that 22% downloaded music on their computers. The filing of lawsuits by the recording industry may be a reason why this percent has decreased from the estimate of 29% from a survey taken two years before. Assume that the sample sizes are both 1371. Using a significance test, evaluate whether or not there has been a change in the percent of internet users who download music. Provide all details for the test. (Round your value for z to two decimal places. Round your P -value to four decimal places.)

$z =$

P -value =

Summarize your conclusion.

- We conclude that the proportions are not different.
- We conclude that the proportions are different.
- We conclude that the means are not different.
- We conclude that the means are different.
- We cannot draw any conclusions using a significance test for this data.

Also report a 95% confidence interval for the difference in proportions. (Round your answers to four decimal places.)

(,)

Explain what information is provided in the interval that is not in the significance test results.

- The interval does not provide any more information than the significance test would tell us
- The significance test does not indicate the direction of change, but the interval shows that the music downloads decreased.
- The interval shows no significant change in music downloads.
- The interval tells us there was a significant change in music downloads, but the test statistic is inconclusive.
- The interval gives us an idea of how large the difference is between the first survey and the second survey.

A survey of Internet users reported that 15% downloaded music on their computers. The filing of lawsuits by the recording industry may be a reason why this percent has decreased from the estimate of 27% from a survey taken two years before. Suppose we are not exactly sure about the sizes of the samples. Perform the calculations for the significance tests and 95% confidence intervals under each of the following assumptions. (Use p values - recent. Round your test statistics to two decimal places and your confidence intervals to four decimal places.)

(i) Both sample sizes are 1000.

$z =$

95% C.I. $\left(\text{ } , \text{ } \right)$

(ii) Both sample sizes are 1600.

$z =$

95% C.I. $\left(\text{ } , \text{ } \right)$

(iii) The sample size for the survey reporting 27% is 1000 and the sample size for the survey reporting 15% is 1600.

$z =$

95% C.I. $\left(\text{ } , \text{ } \right)$

Summarize the effects of the sample sizes on the results.

We see in (i) and (ii) that smaller samples result in smaller z (weaker evidence) and wider intervals, while larger samples have the reverse effect. The results of (iii) show that the effect of varying unequal sample sizes is more complicated.

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According to literature on brand loyalty, consumers who are loyal to a brand are likely to consistently select the same product. This type of consistency could come from a positive childhood association. To examine brand loyalty among fans of the Chicago Cubs, 370 Cubs fans among patrons of a restaurant located in Wrigleyville were surveyed prior to a game at Wrigley Field, the Cubs' home field. The respondents were classified as "die-hard fans" or "less loyal fans." Of the 131 die-hard fans, 94.7% reported that they had watched or listened to Cubs games when they were children. Among the 239 less loyal fans, 66.5% said that they watched or listened to Cubs games as children. (Let $D = p^{\text{die-hard}} - p^{\text{less loyal}}$.)

(a) Find the numbers of die-hard Cubs fans who watched or listened to games when they were children. Do the same for the less loyal fans. (Round your answers to the nearest whole number)

die-hard fans

less loyal fans

(b) Use a one-sided significance test to compare the die-hard fans with the less loyal fans with respect to their childhood experiences relative to the team. (Use your rounded values from part (a). Use $\alpha = 0.01$. Round your z-value to two decimal places and your P-value to four decimal places.)

z =

P-value =

Conclusion

Reject the null hypothesis, there is significant evidence that a higher proportion of die hard Cubs fans watched or listened to Cubs games as children.

Fail to reject the null hypothesis, there is significant evidence that a higher proportion of die hard Cubs fans watched or listened to Cubs games as children.

Fail to reject the null hypothesis, there is not significant evidence that a higher proportion of die hard Cubs fans watched or listened to Cubs games as children.

Reject the null hypothesis, there is not significant evidence that a higher proportion of die hard Cubs fans watched or listened to Cubs games as children.

(c) Express the results with a 95% confidence interval for the difference in proportions. (Round your answers to three decimal places.)

(,)

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Mar 06 2018 6:08PM
 054-0065281
 Lisa Knight-Smith
 Fax Log for

According to literature on brand loyalty, consumers who are loyal to a brand are likely to consistently select the same product. This type of consistency could come from a positive childhood association. To examine brand loyalty among fans of the Chicago Cubs, 399 Cubs fans among patrons of a restaurant located in Wrigleyville were surveyed prior to a game at Wrigley Field, the Cubs' home field. The respondents were classified as "die-hard fans" or "less loyal fans." The study found that 67.7% of the 130 die-hard fans attended Cubs games at least once a month, but only 16.7% of the 269 less loyal fans attended this often. Analyze these data using a significance test for the difference in proportions. (Let $D = P_{\text{die-hard}} - P_{\text{less loyal}}$. Use $\alpha = 0.05$. Round your value for z to two decimal places. Round your P -value to four decimal places.)

$z =$

$P\text{-value} =$

Analyze these data using a 95% confidence interval for the difference in proportions. (Round your answers to three decimal places.)

(,)

Write a short summary of your findings.

- Reject the null hypothesis, there is significant evidence that a higher proportion of die hard Cubs fans attend games at least once a month.
- Fail to reject the null hypothesis, there is significant evidence that a higher proportion of die hard Cubs fans attend games at least once a month.
- Reject the null hypothesis, there is not significant evidence that a higher proportion of die hard Cubs fans attend games at least once a month.
- Fail to reject the null hypothesis, there is significant evidence that a higher proportion of die hard Cubs fans attend games at least once a month.
- Reject the null hypothesis, there is not significant evidence that a higher proportion of die hard Cubs fans attend games at least once a month.

Date	Time	Type	Station ID	Duration	Pages	Result
Mar 6 2018	6:23PM	Received	15042442301	0:00	0	No fax

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