

AN ANALYSIS OF PEYOTE SALES AND EXPERIMENT DATA FROM THE TEXAS
DEPARTMENT OF PUBLIC SAFETY AND THE CACTUS CONSERVATION INSTITUTE

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ABSTRACT

The Native American Church (NAC) uses Peyote (*Lophophora williamsii*) as their Sacrament. Peyote has been used for over 5,000 years in North America in south Texas, documented in the Shumla Caves (Terry, 2006:1017-1018). There are three distributors who harvest it for over 300,000 NAC members in the United States. According the Cactus Conservation Institute's (CCI) website, increasing use and harvest of Peyote have inspired Dr. Martin Terry and others along to conduct experiments on regrowth patterns of Peyote after harvest with the aim of promoting more conservation efforts and sustainable harvesting practices. Dr. Terry and his colleagues posted their data from those experiments on the CCI website. The Texas Department of Public Safety (Texas DPS) makes its Peyote sales data public and is listed on the CCI website. I used the Texas DPS sales data to calculate cost per button from 1986 to 2014 as well as average number of buttons sold from 1986 to 2014. I analyzed Texas DPS data along with data from the CCI using inferential and descriptive statistical procedures to provide information for future research and to highlight the decrease in price of Peyote from 1986 to 2014.

MATERIALS AND METHODS

Materials.—

I obtained all data and research from scholarly articles or from the Texas DPS posted on the CCI website. I used the data from the CCI website as a secondary source, because of scheduling and time constraints, as the request process is lengthy.

Statistical analyses.—

Linear Regression

I calculated the cost per button of Peyote sold by distributors from 1986 to 2014 from Texas Department of Public Safety public data. I determined the cost per button by dividing the total number of buttons sold by the US dollar amount totals for each year. I used linear regression analysis to find the statistical significance between year (x) and cost of button (y) for each year from 1986 to 2014.

Mean, Median, and Mode

I calculated the means, medians, and modes of diameters (cm), heights (cm), and weights (gm) of harvested Peyote buttons from the CCI website's raw data on their website. The data was from an experiment which examined the regrowth patterns of Peyote buttons two years after harvest. I calculated the average number of buttons sold from 1986 to 2014 and it is 1,765,441.

RESULTS AND DISCUSSION

I used the Texas DPS data in Table 2 to calculate the cost per button. The results of my linear regression analysis on cost per button by year were statistically significant. The *R* value was .951, indicating that the cost and time were related beyond the point of chance.

The means, medians, and modes of diameters (cm), heights (cm), and weights (gm) of Peyote buttons from Table 1 leave something to be desired as data. These numbers alone don't offer anything except their values, unless they are compared to corresponding data from two years before harvest or another two years after this particular harvest.

The aforementioned data could provide researchers with the means to determine a relationship between Peyote sales and the size of buttons in future research. Since Peyote is sold by the button and not by weight, or another form of nominal measurement, this can have great implications on the NAC buyers.

I separated "buttons sold" and "Dollars US" from Table 2 to create Table 3. I calculated the average number of buttons sold and year from the Texas DPS data from in Table 3. The average number of buttons sold per year from 1986 to 2014 is 1,765,441.

The linear regression analysis of cost per Peyote button by year from 1986 to 2014 seen in Graph 1 is valuable for several reasons. The data do not behave as expected, because the number of buttons sold over time increase, then decrease as seen in Graph 2. This can be attributed to the passing of the 1994 Religious Freedom and Restoration Act and a resulting jump in NAC membership.

ACKNOWLEDGMENTS

I would like to thank Dr. Martin Terry for providing his data and that of his colleagues on the CCI website from his experiments. This article and the data analysis in it were made possible by him. I would also like to thank the Texas DPS for making their data public and organized in a fashion to make it easy for researchers to analyze. The data used in this article may contribute to protecting the supply of Peyote for generations to come.

REFERENCES

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Terry, Martin, Karen L. Steelman, Tom Guilderson, Phil Dering, and Marvin W. Rowe. 2006. "Lower Pecos and Coahuila Peyote: New Radiocarbon Dates." *Journal of Archaeological Science* 33 (7): 1017-1021.

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diameter mean (cm)	height mean (cm)	weight mean (gm)	diameter median (cm)	height median (cm)	weight median (gm)	diameter mode (cm)	height mode (cm)	weight mode (gm)
4.831707	1.578049	30.07317	5	1.5	28	5	1	23

Table 1

Table 1 represents the median, mode, and average size in diameter (cm), height (cm), and weight (gm) of harvested Peyote buttons from the Cactus Conservation Institute website's raw data.

Total of Peyote Buttons Sold		
1986-2014		
	<i>Buttons</i>	<i>Dollars US</i>
1986	1,913,212	\$149,307.52
1987	1,766,409	\$137,046.30
1988	1,575,766	\$129,051.01
1989	1,572,102	\$129,618.72
1990	1,772,126	\$156,607.29
1991	1,859,189	\$182,544.02
1992	1,886,434	\$192,695.25
1993	1,978,646	\$210,247.60
1994	2,184,739	\$246,632.94
1995	2,252,174	\$234,750.20
1996	2,258,993	\$278,579.50
1997	2,317,380	\$274,500.62
1998	2,076,167	\$277,119.71
1999	2,093,335	\$335,823.02
2000	2,057,020	\$310,722.10
2001	1,934,600	\$360,676.00
2002	1,793,914	\$404,859.50
2003	1,781,170	\$416,727.00
2004	1,669,806	\$393,572.50
2005	1,563,534	\$407,789.50
2006	1,619,115	\$463,714.75
2007	1,605,345	\$474,321.80
2008	1,475,469	\$463,148.00
2009	1,604,623	\$493,834.00
2010	1,483,697	\$459,699.00
2011	1,413,846	\$466,590.50
2012	1,106,209	\$434,609.00
2013	1,363,978	\$530,230.00
2014	1,128,787	\$426,300.00

Table 2

Table 2 represents raw data from the Texas Department of Public Safety with the number of Peyote buttons sold for the amount in US dollars by year from 1986 to 2014.

Buttons Sold	Dollars US
1913212	149307.52
1766409	137046.3
1575766	129051.01
1572102	129618.72
1772126	156607.29
1859189	182544.02
1886434	192695.25
1978646	210247.6
2184739	246632.94
2252174	234750.2
2258993	278579.5
2317380	274500.62
2076167	277119.71
2093335	335823.02
2057020	310722.1
1934600	360676
1793914	404859.5
1781170	416727
1669806	393572.5
1563534	407789.5
1619115	463714.75
1605345	474321.8
1475469	463148
1604623	493834
1483697	459699
1413846	466590.5
1106209	434609
1363978	530230
1218787	426300

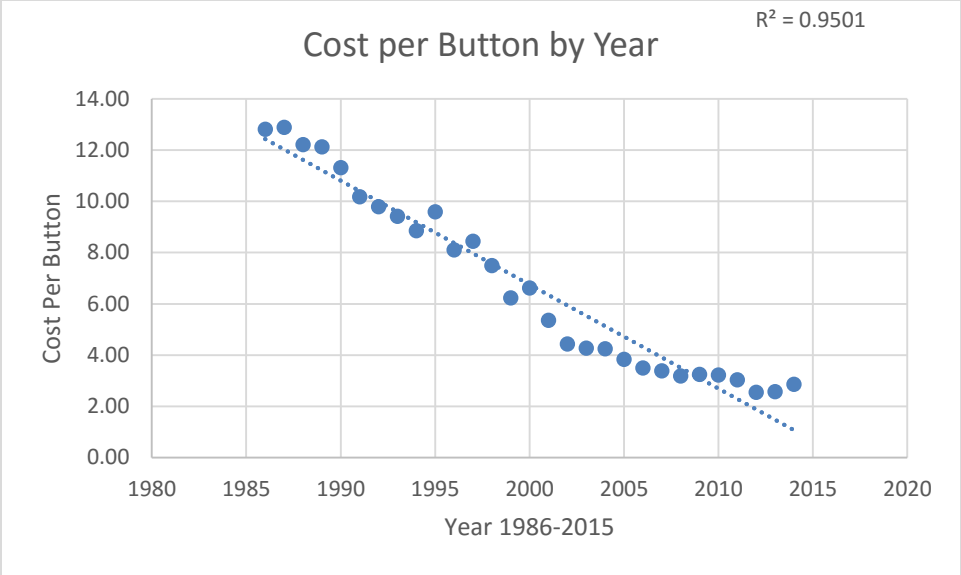
Table 3

Table 3 represents the number of Peyote buttons sold and the total US dollars they sold for by year from 1986 to 2014.

Year	Cost per Button
1986	12.81
1987	12.89
1988	12.21
1989	12.13
1990	11.32
1991	10.18
1992	9.79
1993	9.41
1994	8.86
1995	9.59
1996	8.11
1997	8.44
1998	7.49
1999	6.23
2000	6.62
2001	5.36
2002	4.43
2003	4.27
2004	4.24
2005	3.83
2006	3.49
2007	3.38
2008	3.19
2009	3.25
2010	3.23
2011	3.03
2012	2.55
2013	2.57
2014	2.86

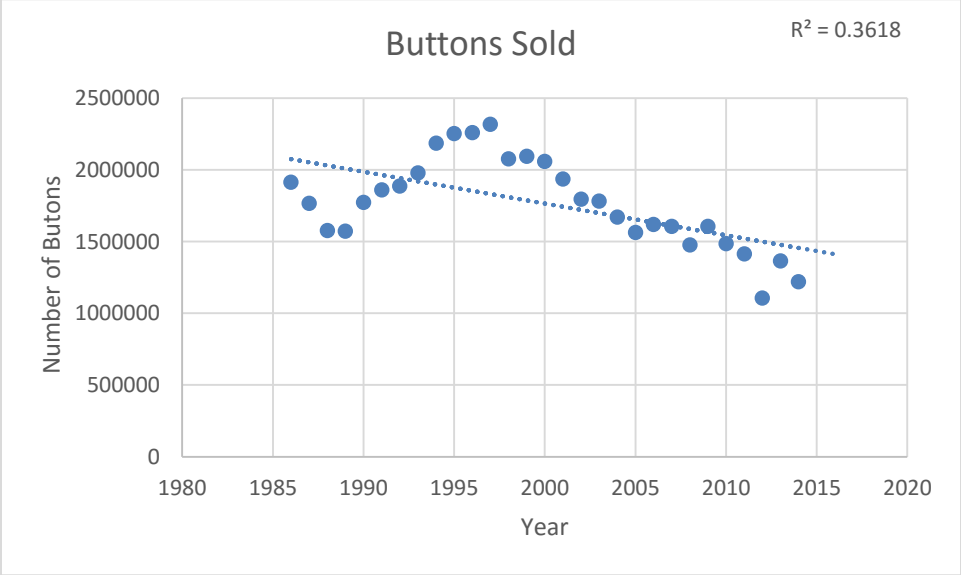
Table 4

Table 4 represents the cost per Peyote button by year from 1986 to 2014.



Graph 1

Graph 1 represents the cost in US dollars per Peyote button by year from 1986 to 2014.



Graph 2

Graph 2 represents the number of Peyote buttons sold per year from 1986 to 2014.