The Economics of Dollarware

Andre Bourgoin-Horne
Department of Anthropology, McGill University

Cite as: Bourgoin-Horne, Andre. 2008. The Economics of Dollarware. Dollarware Project, report 03. http://dollarware.org/report03.pdf.

The economics of Dollarware is a research project which intends to look at two hypotheses. The first hypothesis is aimed at discrediting the idea that buying at the dollar store is one of the cheapest ways to obtain ceramic drinking vessels. The second hypotheses will be investigating whether or not Dollar stores orient their merchandise (in terms of quality) towards the economic status of the location they are being sold in. It was found that there is no correlation between economic location and overall quality. Moreover it was also found that buying at a second hand store is just as, if not more cost effective than buying at a Dollar store, supporting our initial hypotheses.

Introduction

When it comes to purchasing something, whether it being as big as a house or as small as a simple ceramic mug, almost everyone gets satisfaction from knowing that the purchase they have just made was for an incredible deal. This being said, knowing that Dollarware is all priced at $1.00, most people will assume that what they have purchased is truly worth that $1.00. However, could that dollar they spent at any given Dollar store possibly gotten them a mug of similar or possibly even better quality at a second hand discount store like Village de Valeurs?

Another interesting question involving Dollarware involves the demographics of the location and the quality of Dollarware being sold. In other words, will the economic status of the area correlate with the overall quality of Dollarware? The reasoning behind this thinking is as follows, in order to attract both rich and poor customers, dollar stores distribute their product according to the income of the area in which the items are being sold. In essence, the superior or better quality (more expensive to make) Dollarware would be sold in higher income areas in order to attract the "rich" where as the lower and less flashier and less expensive to make Dollarware would be sold in the poorer areas - a marketing ploy which essentially would tap into every source of possible revenue. This being said, the following two hypotheses will be tested for in this research.

Hypothesis 1: Buying second hand ceramic mugs is just as or even more cost effective than buying Dollarware mugs. Moreover not only is it cost effective but the second hand mugs you are buying are of similar or even superior quality to those of any given Dollar store ceramic mug.

Hypothesis 2: Mug quality will differ with regard to the economic status of the locale it is being sold within. Moreover, it will be the richer areas which receive the quality Dollarware and the poorer areas which will sell the inferior quality ceramic mugs.

Methods

Quality of mug will be defined as follows:

-The larger more dense the mug the better the quality it is. This notion is simply based upon the "bigger is better" idea. And seeing that all these vessels cost $1.00 or less and all are used for drinking purposes it would makes sense to say that the larger the mug "the more bang you are getting for your buck".

-Seeing that most mugs are used for drinking coffee/hot chocolate and or tea one would like to think that heat preservation would be a good thing. Thus temperature loss will be calculated for a randomly selected sample of each assemblage (methodology follows). Mugs which have a greater temperature loss over a 5 minute, 5-10 minute and 10 minute time elapsed will be considered inferior in quality.

The methodology used to collect and analyze the data has been based upon three main factors, the demographic location of each Dollar store in terms of the overall average income of the area of those 15 years and older, the quality of mugs from each store (based upon density, mass, volume and heat retention), and statistical analysis (correlation/F-test/t-test analysis between (demographic) location and quality of mug).

With regard to demographics, 2001 census data of the Island of Montreal was used to find the average annual incomes of each Dollar store location. Information regarding the demographics of Montréal was gathered using 2001 statistics and demographic maps provided by Statistics Canada (Statistics Canada, 2001). Locations of each Dollar store were found using MapQuest. In comparing the demographic maps provided by Statisticss Canada to those of the MapQuest maps, relative locations were found pertaining to the average annual income in dollars for those 15 years and older.

Heat preservation/loss was conducted by using a Sunbeam electric tea kettle and 2 electronic thermometers. A random 30% sample was generated for all assemblages (samples can be found on page 11). Each assemblage was brought to the wet lab separately where regular tap water was heated up to precisely 100.5^{o} Celsius (the shut off point for the kettle) and poured into the random sample of mugs. Three measurements were taken, a 5 minute time elapsed, a 5-10 minute time elapsed and an overall change in temperature time elapsed for 10 minutes (Appendix). Measurements were taken by submersing either of the two thermometers into two separate mugs at a time waiting till the digital reader levelled off; this was done until the assemblage was completed. Thus, not all readings were obtained exactly five or ten minutes after, and there is a margin of "human and technological" error. Temperature change, mass, volume displacement and density were correlated with annual income of the region in $ for those 15 years and older. Results yielded can be found on pages (3-4).

Furthermore, it is hypothesized that Dollar stores in richer areas will be selling larger more dense mugs than those of the Dollar stores in poorer areas. Data was collected by using an electronic scale for obtaining the mass, and a beaker for obtaining the displacement volume of each mug. Density was calculated using the formula Mass/Volume Displacement.

When comparing Village des Valeurs quality to that of Dollarware the following data were used.

- 30% random sample for heat preservation/loss
-100% sample of all assemblages pertaining to mass, volume displacement, and density.

Results were obtained by grouping all the Dollarware (N=228) together and comparing the total against the data for assemblage N Village des Valeurs (N=61). F-tests were conducted to determine if the variances differed between the two variables and once that was determined, t-tests were conducted to determine whether or not the means of Dollarware (Mass, Volume, Density, Overall temperature loss 0-10 minutes) were statistically significant to that of Village des Valeurs (Means, Volume Displacement, Density and Overall temperature loss 0-10 minutes). The following Data can be found on pages (5-8).

Results

Correlation between Temperature change and Average Annual Income of Region

Site	Temp Change After 5 minutes	Temp Change from 5-10 minutes	Overall Change	Average Annual income of region in $ for those 15 years and older
A	32.166	8	40.033	68849.5
B	28.966	7.33	36.3	68849.5
C	32.06	7.183	39.25	68849.5
D	31.33	7.366	38.7	31999.5
E	28.777	6.88	35.55	68849.5
F	29.466	8.766	38.283	68849.5
G	35.2	8.6	43.8	31849.5
H	26.2	9.3	35.3	24049.5
I	30.383	8.433	38.766	68849.5
J	31.615	8.5	40.033	68849.5
K	31.2	6.75	37.916	68849.5
L	30.6	7.616	38.216	68849.5
M	30.55	8.4	38.95	16889
Correlation between Temp Change and Income	**.022543**	**-.44802**	**-.13796**	

Results Continued:

Correlation between Average Assemblage Mass, Volume, Density and Average Annual Income of Region

Site	Average Mass of Assemblage	Average Volume displacement of Assemblage	Average Density of Assemblage	Average Annual income of region in $ for those 15 years and older
A	326.7	144.35	2.263	68849.5
B	346.7	149.2	2.323	68849.5
C	254.7	111.5	2.284	68849.5
D	330.3	149.55	2.208	68849.5
E	383.5	158.65	2.417	31999.5
F	321.9	149.85	2.148	68849.5
G	302.9	128.5	2.357	68849.5
H	313.5	142.66	2.197	31849.5
I	331.7	148.4	2.235	24049.5
J	266.1	123.35	2.157	68849.5
K	326.4	147.7	2.209	68849.5
L	310.4	130.875	2.371	68849.5
M	319.1	141.55	2.254	16889
Correlation between Mass/income, Volume/income, density/income	**.009**	**.030**	**-.013**	

It is clear that no strong correlations are present indicating that hypothesis two is not supported and that dollar stores do not sell according to the economic demographics of the region. Note: Value village was excluded from the calculations because it is not a true Dollar store.

Results Continued:

F-Test Two-Sample for Mass Variances

	Variable 1	*Variable 2*
Mean	319.3592105	316.1704918
Variance	6509.56736	5502.334781
Observations	228	61
df	227	60
F	1.183055488	
P(F<=f) one-tail	0.222484091	
F Critical one-tail	1.432232952	

Ho: Variances (mass) are Different P<.05
H1: Vareiances (mass) are the same P>.05
P>.05 No Significance in mass variance

t-Test: Two-Sample Assuming Equal Variances (MASS)

	Variable 1	*Variable 2*
Mean	319.3592105	316.1704918
Variance	6509.56736	5502.334781
Observations	228	61
Pooled Variance	6298.996089	
Hypothesized Mean Difference	0	
df	287	
t Stat	0.278717323	
P(T<=t) one-tail	0.390331242	
t Critical one-tail	1.650180211	
P(T<=t) two-tail	0.780662484	
t Critical two-tail	1.968264051	

Ho: There is a difference in Mean Weight
H1: There is no difference in mean weight
P>.05 there is no difference in mean weight

Results Continued:

F-Test Two-Sample for Volume (Displacement) Variances

	Variable 1	*Variable 2*
Mean	142.2807018	135
Variance	1283.31293	1208.666667
Observations	228	61
df	227	60
F	1.061759181	
P(F<=f) one-tail	0.401400639	
F Critical one-tail	1.432232952	

Ho: Variances (Volume) are Different P<.05
H1: Variances (Volume) are the same P>.05
P>.05 No significance in volume variances

t-Test: Two-Sample Assuming Equal Variances (Volume displacement)

	Variable 1	*Variable 2*
Mean	142.2807018	135
Variance	1283.31293	1208.666667
Observations	228	61
Pooled Variance	1267.707439	
Hypothesized Mean Difference	0	
df	287	
t Stat	1.418558143	
P(T<=t) one-tail	0.078556428	
t Critical one-tail	1.650180211	
P(T<=t) two-tail	0.157112856	
t Critical two-tail	1.968264051	

Ho: Difference in mean volume
H1: No difference in mean volume
P>.05 there is no significant difference

Results Continued:

F-Test Two-Sample for Density Variances

	Variable 1	*Variable 2*
Mean	2.254792004	2.376574897
Variance	0.04562857	0.100638625
Observations	228	61
df	227	60
F	0.453390241	
P(F<=f) one-tail	1.58993E-05	
F Critical one-tail	0.725836042	

Ho: Variances (Density) are Different P<.05
H1: Variances (Density) are the same P>.05
P<.05 Significant Village des Valeurs greater variance in density

t-Test: Two-Sample Assuming Unequal Variances (Density)

	Variable 1	*Variable 2*
Mean	2.254792004	2.376574897
Variance	0.04562857	0.100638625
Observations	228	61
Hypothesized Mean Difference	0	
df	75	
t Stat	-2.83144154	
P(T<=t) one-tail	0.002972871	
t Critical one-tail	1.665425374	
P(T<=t) two-tail	0.005945743	
t Critical two-tail	1.992102124	

Ho: Difference in mean density
H1: No difference in mean density
P<.05 there is significant difference (Village Des Valeurs is higher)

F-Test Two-Sample for Variances (Temperature change after 10 minutes)

	Variable 1	*Variable 2*
Mean	36.72752632	38.46666667
Variance	65.98120837	10.60941176
Observations	19	18
df	18	17
F	6.219120328	
P(F<=f) one-tail	0.000217447	
F Critical one-tail	2.256670966	

Ho: Variances (Temp change 0-10 minutes) are Different P<.05
H1: Variances (Temp change 0-10 minutes) are the same P>.05

t-Test: Two-Sample Assuming Unequal Variances (Temperature change after 10 minutes)

	Variable 1	*Variable 2*
Mean	36.72752632	38.46666667
Variance	65.98120837	10.60941176
Observations	19	18
Hypothesized Mean Difference	0	
df	24	
t Stat	-0.862896992	
P(T<=t) one-tail	0.19836765	
t Critical one-tail	1.710882067	
P(T<=t) two-tail	0.396735299	
t Critical two-tail	2.063898547	

Ho: Difference in Temperature loss from 0-10 minutes.
H1: No difference in mean Temperature loss from 0-10 minutes.

P>.05 there is significant difference in temperature loss means. Village des Valuers is higher indicating greater temperature loss.

Summary of Results

It is clear that there are no significant differences between the mean mass and volumes of Dollarware and Village des Valeurs ceramic mugs. There is statistical difference between the densities, however, indicating that Village des Valeurs mugs have a statistically higher average density (2.376574897) when compared to Dollarware (2.254792004). However when comparing heat loss data, statistical significance is shown when comparing the Dollarware mean (36.72752632) to that of Village des Valeurs mean (38.46666667), indicating that Village des Valeurs mugs are worse at retaining heat.

Seeing that Dollarware is better at retaining heat, and that Village des Valeurs sells more dense mugs, and that neither of the two vary statistically in terms of mass and volume displacement, it cannot be concluded that one place sells better ceramic mugs than the other in terms of quality. However from a financial point of view, Village des Valeurs is the more cost effective of the two seeing that the average cost per mug was 38 cents compared to $1.00 at the Dollar stores. Thus providing support for hypothesis one.

Conclusions:

In conclusion, Dollarware cannot be differentiated according to the region it is being sold within. The correlational studies have shown that economic region does not associate with the quality of mug being sold. Providing evidence against the hypothesis (Mug quality will differ with regard to the economic status of the locale it is being sold within. Moreover, it will be the richer areas which receive the quality Dollarware and the poorer areas which will sell the inferior quality ceramic mugs).

Furthermore, data analysis has shown that Village des Valeurs (the second hand store) sells similar quality mugs (38 cents a mug) as those of any of the dollar stores ($1.00 a mug). Thus making it more cost effective to buy second hand, supporting the initial hypothesis (buying second hand ceramic mugs is just as or even more cost effective than buying Dollarware mugs. Moreover not only is it cost effective but the second hand mugs you are buying are of similar or even superior quality to those of any given Dollar store ceramic mug).

Interpretations:

-Dollar stores will in general opt for the lowest quality products to ensure that their profit margin will not be affected.

-Second hand stores like Village des Valeurs reflects a wider array of ceramic mugs in terms of quality because of the following reasons.

-Village des Valeurs receives ceramic vessels from people who want to get rid of them. This being said the variety of vessels can range from top quality (Antiques, and High end products) to low quality (ugly gifts and even Dollarware); there is no one standard in terms of quality. What happens to be in the store at the time you are there will determine what you the buyer will ultimately end up with. Thus, second hand stores will constantly be differing in terms of quality, it is in a sense the luck of the draw when shopping at a store like this, and you never know what you may end up with. This potentially causes a problem for the research and its results which will be explored next.

Possible Complications:

-Non representative samples from the selected locations. Meaning that the samples of each location may not accurately represent the totality of what is being offered from each store in terms of ceramic drinking vessels. This may have an impact on the variables being studied i.e. the average mass, volume displacement, density and temperature retention/loss of each assemblage.

-Many of the Dollarware locations are within proximity of one another thus making the demographic data pertaining to average annual income of region in $ for those 15 years and older extremely similar and NOT providing a representative sample of Montreal's economic demographics.

-As previously mentioned the inventory at places like Village des Valeurs is ever-changing; thus, depending on when you happen to be there the quality in mugs you receive may or may not be the same.

Further potential research:

-A great way to further expand this project would be to draw upon a larger research area, for instance instead of just the "Downtown" area of Montreal, possibly the entirety of Montreal and surrounding areas could be selected for.

-Moreover, it would be interesting to see if chain stores like Dollarama differ from privately run dollar stores in terms of quality and distribution of merchandise. This would require a much larger sample of Dollaramas and privately run dollar stores in and around the city of Montreal.

-Higher more elaborate testing could be done on the mugs, tests involving the quality of paint being used on the mugs, the quality of ceramics being used and whether or not it differs from privately run dollar stores and chain run.

In the last few weeks, Dollarware has provided incredible insight into various aspects of North American material culture. Through the use of data collection from each assemblage and statistical analysis, a better understanding of Dollarware in terms of quality and demographics has been brought to light. However, this being the first study of its kind, and given the short period of time it was conducted in, it should be noted that this study has just only begun to scratch at the surface of studying Dollarware ceramic drinking vessels. Hopefully this project/research will spark an interest for others to follow and begin their own research with regard to the fascinating aspects of inexpensive North American material culture, namely Dollarware.

Appendix: Data
30% Random Sample

Site A Item #	Site B Item #	Site C Item #	Site D Item #	Site E Item #	Site F Item #
8	12	5	10	14	4
13	15	6	11	13	6
1	16	8	1	19	15
6	14	19	19	2	14
19	8	17	15	15	13
18	1	9	17	1	8

Site G Item #	Site H Item #	Site I Item #	Site J Item #	Site K Item #	Site L Item #
1	3	19	1	7	11
	5	12	19	11	1
		5	11	14	5
		3	8	12	2
		20	9	4	9
		17	12	5	6

Site M Item #	Site N Item #
19	18
12	4
5	1
3	11
20	10
17	9
	13
	16
	36
	2
	44
	19

46	
54	
60	
14	
12	
15	

Temperature Change in Degrees Celsius

Change After 5 minutes	Change From 5 – 10 minutes	Change After 10 minutes
Assemblage G (35.2)	Assemblage H (9.3)	Assemblage G (43.8)
Assemblage A (32.66)	Assemblage F (8.766)	Assemblage J (40.033)
Assemblage C (32.06)	Assemblage G (8.6)	Assemblage A (40.233)
Assemblage J (31.616)	Assemblage I (8.433)	Assemblage C (39.25)
Assemblage D (31.33)	Assemblage M (8.4)	Assemblage M (39.25)
Assemblage K (31.2)	Assemblage J (8.35)	Assemblage I (38.766)
Assemblage N (30.7944)	Assemblage A (8)	Assemblage D (38.7)
Assemblage L (30.6)	Assemblage N (7.672)	Assemblage N (38.4)
Assemblage M (30.55)	Assemblage L (7.616)	Assemblage F (38.283)
Assemblage I (30.383)	Assemblage D (7.366)	Assemblage L (38.216)
Assemblage F (29.466)	Assemblage B (7.33)	Assemblage K (37.916)
Assemblage B (28.966)	Assemblage C (7.183)	Assemblage B (36.3)
Assemblage E (28.766)	Assemblage E (6.88)	Assemblage E (35.55)
Assemblage H (26.2)	Assemblage K (6.75)	Assemblage H (35.3)

Works Cited

Daniels, Michael. 2001-2003. Psychic science.com: Random number generator. Retrieved February 19th, 2008, from http://www.mdani.demon.co.uk/para/random.htm

Statistics Canada. 2001. Montréal en Statistiques: Atlas démographique et socio-économique de la population montréalaise. Retrieved February 12th, 2008, from http://ville.montreal.qc.ca/portal/page?_pageid=2076,2453911&_dad=portal&_schema=PORTAL