MSMK 7003A

Market Research for Yunnan Baiyao Toothpaste

Team 1

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01 Background

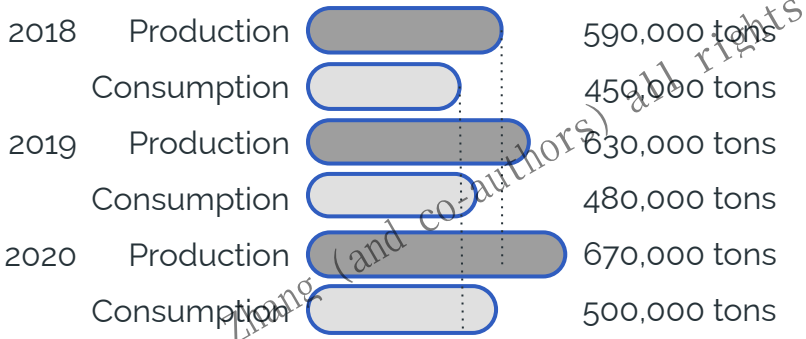
Background - CIC Introduction

Company

Yunnan Baiyao is a secret recipe of Traditional Chinese medicine in China. **Yunnan Baiyao Group (YB) was formally established in 1993**. To this day, YB's recipe remains secret. As the No.1 national treasure of Traditional Chinese medicine, YB has made remarkable achievements in the market of health care products and daily necessities in recent years, where **YB toothpaste is a flagship brand of the group.**

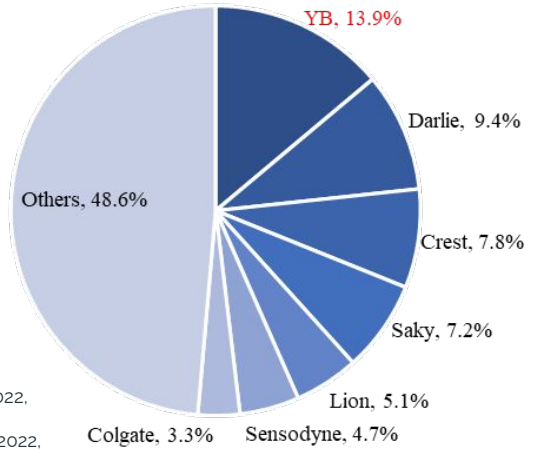
Industry

In recent years, China has become the world's largest producer and consumer of toothpaste.



Competitors

YB ranked first in the sales of China's top ten toothpaste brands in 2020, followed by Darlie and Crest.



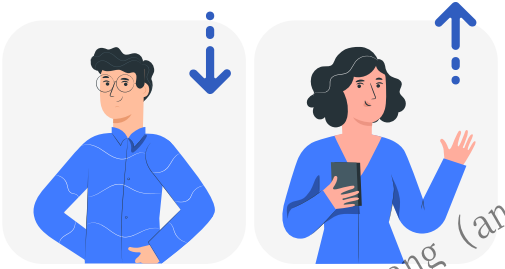
Sources:
[1] yunnanbaiyao.com.cn. (2022). Retrieved 30 April 2022, from http://www.yunnanbaiyao.com.cn/list/ynbyPc/1/2/auto/20/0.html.
[2] 2021年中国牙膏行业市场规模及龙头企业分析：云南白药牙膏市场占有率逐年攀升[图]. View.inews.qq.com. (2022). Retrieved 30 April 2022, from https://view.inews.qq.com/a/20220209A07U4H00.0
[3] Market competition pattern and enterprise market share analysis of Chinese toothpaste industry in 2021. (2021). Retrieved 1 May 2022, from https://www.qianzhan.com/analyst/detail/220/210402-54ee2d8a.html

Background - Data Introduction

Data Source: Online Survey (Convenient Sample)
Sample Size: **128 effective samples** (271 in total)

Demographic Distribution

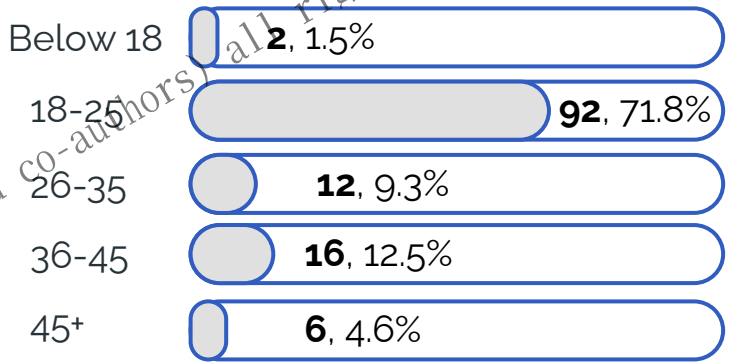
Gender



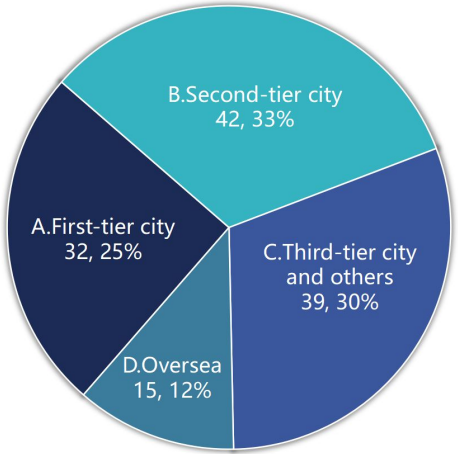
45
35%

83
65%

Age Groups



Locations



02 Research Objective

Research Objective (3Es)

To evaluate customers attitude about YB toothpaste in terms of different attributes and providing recommendations for expanding its market share and enhancing its brand image

03 Strategy

Strategy #1 – Product Development

Why should Yunnan Baiyao (YB) consider this strategy?

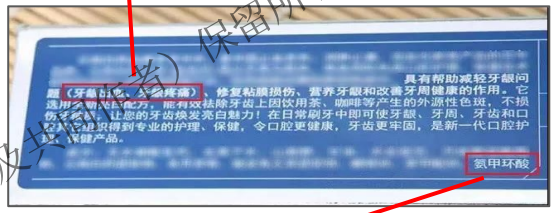
➢ **For customers: Concerns towards TXA**

- YB toothpaste contains prescription drug TXA (not prohibited by law but controversial)
- YB advertises its “secret formula” that stops bleeding while the prescription drug seems to be the real cure

➢ **For the company: A Brand Image Savior**

- The TXA scandal disclosed in 2018 put YB into a PR crisis
- Arguments about TXA were everywhere on the internet, especially on Chinese “Quora”---- “Zhihu” platform
- On Zhihu alone, there were over 3 million page views of this scandal, and **most comments were negative**

Function: Bleeding and Pain Relief



Ingredient: Tranexamic Acid (TXA)

“How do you think about the TXA issue?”

3.13 Million PVs

Source:
[1] Southwest Securities. (2021). 云南白药(000538)医药生物. Southwest Securities. Retrieved from https://pdf.dfcfw.com/pdf/H3_AP202104151485172009_1.pdf
[2] 如何评价云南白药等中药牙膏被曝出含有氨甲环酸？ - 知乎. Zhihu.com. (2022). Retrieved 30 April 2022, from https://www.zhihu.com/question/299487453.

Strategy #1 - Product Development

Research Q1 - Is YB Effectively Building An Ingredient-Safe Brand Image?

Method: Means comparison - one sample T Test

Questions used for analysis:

Q: Based on your experience, how would you evaluate the safety of YB toothpaste ingredients? (interval)

1 —-----2—-----3—-----4—---5—---6—-----7

Not Very Safe Average Level Very Safe

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
YB ingredient	128	5.55	1.142	.101

One-Sample Test

Test Value = 4

	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference Lower	Upper
YB ingredient	15.403	127	<.001	1.555	1.35	1.75

Hypothesis:

Ho: the average score of YB ingredient = **4**

H1: the average score of YB ingredient ≠ **4**

Test statistic:

T (127) = 15.403, p <0.001

p < 0.05 → reject Ho, and support H1

Conclusions:

- YB gets a score (**5.55**) of ingredient safety above average level (**4**)
- YB effectively built an above-average ingredient-safe brand image

Strategy #1 - Product Development

Research Q2 - Does TXA Negatively Impact Willingness to Buy?

Method: Linear regression

Questions used for analysis:

Q: Based on your experience, how would you evaluate the safety of YB toothpaste ingredients? (interval)

1 —-----2—-----3—-----4—---5—---6—-----7

Not Very Safe Average Level Very Safe

Q: Does the presence of TXA (drug name) in the ingredients affect your willingness to buy YB toothpaste? (interval)

1 —-----2—-----3—-----4—---5—---6—-----7

No Influence Hesitant To Buy Stop Buying

Y= TXA impact (TXA impact on unwillingness to buy YB toothpaste)

X= YB ingredient (the score of the safety of YB ingredient)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.197[a]	.039	.031	1.552

a. Predictors: (Constant), TXA impact on willingness to buy YB toothpaste

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	3.121	.684		4.565	<.001
	YB ingredient	.272	.121	.197	2.257	.026

a. Dependent Variable: TXA impact

R-square = 0.039, p<0.05

TXA impact (Y) = 3.121+0.272*YB ingredient (X)

Conclusions:

- One unit increase in the score of **YB ingredient's safety** can result in **0.272 units** increase in **TXA impact** on unwillingness to buy YB toothpaste
- People considering YB as **a more safe brand** are **less likely to buy** YB toothpaste when being aware of TXA

Strategy #1 - Product Development

Research Q3-1- Flavour Preferences of New Product

Method: One proportion test

Questions used for analysis:

For the new product, which flavours do you prefer? (nominal, multiple-choices up to 3)

A. Flavour 1: classic flavour
B. Flavour 2: tea flavour
C. Flavour 3: flower flavour
D. Flavour 4: fruit flavour
E. Flavour 5: natural flavour

0=Did not choose the flavour

1=Choose the flavour

Binomial Test

		Category	N	Observed Prop.	Test Prop.	Exact Sig. (2-tailed)
Flavour1: classic flavour	Group 1	1	77	.60	.50	.027
	Group 2	0	51	.40		
	Total		128	1.00		
Flavour2: tea flavour	Group 1	1	81	.63	.50	.003
	Group 2	0	47	.37		
	Total		128	1.00		
Flavour3:flower flavour	Group 1	1	59	.46	.50	.426
	Group 2	0	69	.54		
	Total		128	1.00		
Flavour4:fruit flavour	Group 1	0	78	.61	.50	.017
	Group 2	1	50	.39		
	Total		128	1.00		
Flavour5:natural flavour	Group 1	0	94	.73	.50	<.001
	Group 2	1	34	.27		
	Total		128	1.00		

Hypothesis:

X: Proportion of people choosing the flavour

Ho: x = 50% **H1:** x ≠ 50%

Test statistic:

Classic flavour: p<0.05→ reject Ho, and support H1

Tea flavour: p<0.05→ reject Ho, and support H1

Conclusions:

- For the new product, more than 50% of the people prefer **classic flavour** and **tea flavour**

Strategy #1 - Product Development

Research Q3-2- Does Gender Have An Impact On Flavour Preferences?

Method: Two independent proportions test

Questions used for analysis:

Q: What is your gender? (nominal, single choice)

Male, Female

Q: For the new product, which flavours do you prefer? (nominal, multiple-choice up to 3)

A. **Flavour 1: classic flavour**
B. **Flavour 2: tea flavour**
C. Flavour 3: flower flavour
D. Flavour 4: fruit flavour
E. Flavour 5: natural flavour

0=Did not choose the flavour
1=Chose the flavour

1=Male
2=Female

Hypothesis:

Ho: There is **no difference between** female and male in terms of flavour preferences

H1: There is **a significant difference** between female and male in terms of flavour preferences

Strategy #1 - Product Development

Research Q3-2- Does Gender Have An Impact On Flavour Preferences?

Method: Two independent proportions test

Gender X Classic flavour Crosstabulation

			classic flavour 0	classic flavour 1	Total
gender	male	Count	19	26	45
		gender	42.2%	57.8%	100.0%
		classic flavour	37.3%	33.8%	35.2%
	female	Count	32	51	83
		gender	38.6%	61.4%	100.0%
		classic flavour	62.7%	66.2%	64.8%
Total		Count	51	77	128
		gender	39.8%	60.2%	100.0%
		classic flavour	100.0%	100.0%	100.0%

Gender X Classic flavour

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.164[a]	1	.686		
Continuity Correction[b]	.047	1	.829		
Likelihood Ratio	.163	1	.686		
Fisher's Exact Test				.709	.413
Linear-by-Linear Association	.163	1	.687		
N of Valid Cases	128				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 17.93.

b. Computed only for a 2x2 table

Gender X Tea flavour Crosstabulation

			tea flavour 0	tea flavour 1	Total
gender	male	Count	22	23	45
		gender	48.9%	51.1%	100.0%
		tea flavour	46.8%	28.4%	35.2%
	female	Count	25	58	83
		gender	30.1%	69.9%	100.0%
		tea flavour	53.2%	71.6%	64.8%
Total		Count	47	81	128
		gender	36.7%	63.3%	100.0%
		tea flavour	100.0%	100.0%	100.0%

Gender X Tea flavour

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	4.424[a]	1	.035		
Continuity Correction[b]	3.653	1	.056		
Likelihood Ratio	4.372	1	.037		
Fisher's Exact Test				.054	.029
Linear-by-Linear Association	4.389	1	.036		
N of Valid Cases	128				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 16.52.

b. Computed only for a 2x2 table

Test statistic:

- **Classic flavour:**
  χ^2 (1) = 0.164, p = 0.686
  p>0.05→ not significant
- **Tea flavour:**
  χ^2 (1) = 4.424, p = 0.035
  p<0.05→ reject Ho, and support H1
- **51.1%** of **males** prefer tea flavour
  69.9% of **females** prefer tea flavour

Conclusions:

- There is **significant difference** between men and women on preference on **tea flavour**
- **Women** prefer tea-flavoured toothpaste **over men**

Strategy #1 - Recommendations To Yunnan Baiyao

Findings Obtained from Analysis → **One Unified Strategy**

Finding 1: YB effectively built an **above-average** ingredient-safe brand image

Finding 2: People considering YB as **a more safe brand** are **less likely to buy** YB toothpaste when being aware of TXA

Finding 3a: For the new product, **more than 50%** of the people prefer **classic flavour** and **tea flavour**

Finding 3b: **Women** prefer tea-flavoured toothpaste **over men**

Launch a new toothpaste SKU to satisfy customer needs and win back their trust

- Stands for **natural ingredients**, add more organics and **remove TXA**
- Have **two** flavours: **classic** and **tea**

- Target **female customers** when promoting tea-flavoured toothpaste

Strategy # 2 - Packaging

Research Q1 - Do respondents think YB toothpaste have good package design?

Method: Paired Sample t Test

Questions used for analysis

Q: Please state your opinion for toothpaste on the following scale:
Have fascinating package design is (Interval) **Too_design**
-3 —---------2—---------1—--------0—-------1—------2—-------—3
Extremely Undesirable Extremely Desirable

Q: Please tell us what you think about YB toothpaste on these features:
YB has fascinating package design (Interval) **YB_design**
-3 —---------2—---------1—--------0—-------1—------2—-------—3
Extremely Disagree Extremely Agree

Hypothesis:

H0: Too_design - YB_design = 0
H1: Too_design - YB_design ≠ 0

Test statistic:

P = 0.002 < 0.05, statistically significant
Too_design - YB_design = 0.461
Reject H0

Conclusion:

Our respondents think YB toothpaste's package design do not reach their expectations.

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Too_design	.87	128	1.394	.123
	YB_design	.41	128	1.153	.102

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Too_design - YB_design	.461	1.655	.146	.171	.750	3.151	127	.002

Strategy # 2 - Packaging

Research Q2-1 - What factors may impact respondents' attitudes towards YB toothpaste's package design?

Method: Linear Regression

Age
Interval

age=1: below 17
age=2: 18-25
age=3: 26-35
age=4: 36-45
age=5: 46+

Linear Regression: Age on YB_design

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics: R Square Change	F Change	df1	df2	Sig. F Change
1	.292[a]	.085	.078	1.107	.085	11.712	1	126	.001

Coefficients[a]

Model		Unstandardized Coefficients: B	Unstandardized Coefficients: Std. Error	Standardized Coefficients: Beta	t	Sig.
1	(Constant)	-.512	.286		-1.792	.076
	what's your age?	.372	.109	.292	3.422	.001

a. Dependent Variable: how you think : YB has fascinating packaging design

Hypothesis:

H0: There is no linear relationship between Age and YB_design (Attitude towards YB's package design).

H1: There is a linear relationship between Age and YB_design (Attitude towards YB's package design)..

Test statistic:

P = 0.001 < 0.05, statistically significant. **Reject Ho.**

YB_design =(0.372 * Age) - 0.512

(P = 0.001 < 0.05, adjusted R Square = 0.078)

Conclusion:

There is a positive linear relationship between Age and Attitude towards YB's package design.

Strategy # 2 - Packaging

Research Q2-2 - What factor may impact respondents' attitudes towards YB toothpaste's package design?

Method: Factor Analysis

Personality

Interval

Communalities

	Initial	Extraction
Energetic	1.000	.416
Appearance	1.000	.527
Mature	1.000	.792
Curious	1.000	.359
Detailed	1.000	.617
Generous	1.000	.554
Life_Quality	1.000	.419

Extraction Method: Principal Component Analysis.

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.679
Bartlett's Test of Sphericity	Approx. Chi-Square	159.617
	df	28
	Sig.	.000

> 0.5

< 0.05

Total Variance

Component	Initial Eigenvalues Total	% of Variance	Cumulative %	Extraction Sum Total	% of
1	2.527	36.094	36.094	2.527	
2	1.156	16.508	52.602	1.156	
3	.958	13.684	66.286		
4	.745	10.646	76.932		
5	.581	8.304	85.236		
6	.550	7.856	93.092		
7	.484	6.908	100.000		

Component Matrix

	Component 1	2
Energetic	.644	.025
Appearance	.725	.037
Mature	−.109	.883
Curious	.599	.015
Detailed	.355	.700
Generous	.707	.232
Life_Quality	.554	.335

Factor1 : Self-Conscious

Energetic,image-conscious, Curious, Generous, Life-quality

Factor2 : Mature

Mature, Detailed

Strategy # 2 - Packaging

Research Q2-2 - What factor may impact respondents' attitudes towards YB toothpaste's package design?

Method: Linear Regression

Personality

Factor1 : Self-Conscious

Energetic, Appearance, Curious, Generous, Life-quality

Factor2 : Mature

Mature, Detailed

Linear Regression: personality factor on attitude

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.159[a]	.025	.010	1.047	.025	1.627	2	125	.201

a. Predictors: (Constant), REGR factor score 2 for analysis 1, REGR factor score 1 for analysis 1

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1	(Constant)	.406	.101		4.005	.000	.206	.607
	REGR factor score 1 for analysis 1	-.061	.102	-.053	-.603	.547	-.263	.140
	REGR factor score 2 for analysis 1	.173	.102	.150	1.700	.092	-.028	.375

a. Dependent Variable: how do you think: YB has fascinating package design

Conclusion:

There is a marginally significant positive relationship between Attitude towards YB's package design and personality factor 2.

YB_design = (0.173 Factor 2) + 0.406*

(P = 0.092 < 0.1, adjusted R Square = 0.010)

Strategy # 2 - Packaging

Research Q3-1 - What kind of package design do respondents prefer?

Method: Multinomial Logistic Regression

Questions used for analysis

Q: Which package form do you like mostly? (nominal)

1.Traditional 2.Standing 3.Standing Vacu

Multinomial Logistic Regression: Age on package prefer

Parameter Estimates

packingprefer[a]		B	Std. Error	Wald	df	Sig.	Exp(B)	95% Confidence Interval for Exp (B) Lower Bound	Upper Bound
standing pack	Intercept	-18.854	.667	799.852	1	.000			
	[age=1]	37.530	11359.487	.000	1	.997	1.991E+16	.000	.[b]
	[age=2]	18.044	.719	630.132	1	.000	68579857.74	16763199.85	280566773.1
	[age=3]	17.468	1.302	180.080	1	.000	38576169.98	3008174.402	494692358.7
	[age=4]	17.756	.000	.	1	.	51434893.31	51434893.31	51434893.31
	[age=5]	0[c]	.	.	0	.	.	.	.
standing vacu pack	Intercept	.693	.866	.641	1	.423			
	[age=1]	17.982	11359.487	.000	1	.999	64518995.59	.000	.[b]
	[age=2]	-1.204	.900	1.791	1	.181	.300	.051	1.749
	[age=3]	-.134	1.069	.016	1	.901	.875	.108	7.112
	[age=4]	-1.504	1.054	2.036	1	.154	.222	.028	1.754
	[age=5]	0[c]	.	.	0	.	.	.	.

a. The reference category is: traditional pack.

b. Floating point overflow occurred while computing this statistic. Its value is therefore set to system missing.

c. This parameter is set to zero because it is redundant.

Benchmark ([age=5])

Conclusion:

Compared to traditional package, young generation between 18-35 (age =2 & age =3) have higher probability preferring more on standing package form than elder group. (P < 0.01)

(Benchmark: age = 5, reference category: Traditional package).

Strategy # 2 - Packaging

Research Q3-2 - What kind of package design do respondents prefer?

Method: Multinomial Logistic Regression

Multinomial Logistic Regression: personality factor on package prefer

Factor1 : Self-Conscious

Energetic, image-conscious
Curious, Generous,
Life-quality

Factor2 : Mature

Mature, Detailed

Parameter Estimates

packingprefer[a]		B	Std. Error	Wald	df	Sig.	Exp(B)	95% Confidence Interval for Exp (B) Lower Bound	Upper Bound
standing pack	Intercept	-.968	.255	14.371	1	.000			
	REGR factor score 1 for analysis 1	.486	.267	3.308	1	.069	1.625	.963	2.743
	REGR factor score 2 for analysis 1	.220	.249	.785	1	.376	1.246	.766	2.029
standing vacu pack	Intercept	-.348	.202	2.955	1	.086			
	REGR factor score 1 for analysis 1	-.150	.204	.540	1	.462	.861	.578	1.283
	REGR factor score 2 for analysis 1	.142	.208	.470	1	.493	1.153	.767	1.732

a. The reference category is: traditional pack.

Conclusion:

Respondents have higher score in Factor 1-self conscious might have higher probability preferring more on standing package form than traditional package.
(P = 0.069 < 0.1, marginally significant) (Reference category: Traditional package).

Strategy # 2 - Recommendation to Yunnan Baiyao

Findings Obtained from Analysis → **One Unified Strategy**

- **Finding 1:** YB's packaging can be improved to better meet people's demand
- **Finding 2:** (1) Age has impact on people's attitude towards package.The higher the age, the better attitude on YB's package design.

  (2) Personality impacts people's attitude towards packaging. More "mature" people will have better impression on YB's packaging.
- **Finding 3:** (1) Young generation (18-35) prefer standing packaging than elder groups (36+) do

  (2) People with stronger "self-conscious" personality prefer standing packaging than traditional package.

Yunnan Baiyao could develop standing package forms to embrace young generations taste with a targeting strategy towards high "self-conscious" people.

Strategy # 3 - Pricing

Research Q1 - Do people think YB toothpaste is expensive?

Method: Two Dependent Mean Comparison

Q: Please state your opinion for toothpaste on the following scale: (interval scale)

a. Having high price is

-3 —---------2—---------1—--------0—-------1—------2—-------—3

Extremely Undesirable Extremely Desirable

Q: Please tell us what you think about YB toothpaste on these features: (interval scale)

a. YB toothpaste is high in price

-3 —---------2—---------1—--------0—-------1—------2—-------—3

Extremely Disagree Extremely Agree

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Too_Price	-.09	128	1.506	.133
	YB_Price	1.08	128	1.233	.109

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
air 1	Too_Price - YB_Price	-1.164	1.489	.132	-1.424	-.904	-8.845	127	.000

Strategy # 3 - Pricing

Analysis 1- Do people think YB toothpaste is expensive?

Method: **Fishbein's Model**

Fishbein's Model

云南白药 YUNNAN BAIYAO

	Belief Strength(bi)		Eval Score(ei)	bi*ei
High Price	1.08	>	0.09	
Fantastic Design				
High Functionality				
Good WOM				
Overall Attitude				

Respondents think YB toothpaste price higher than their expected for a toothpaste

Need to be further tested to apply to the population

b_i = extent of belief/knowledge that object O possesses attribute i (*how about attribute i of the brand?*)

e_i = evaluation of attribute i (*how important/desirable is the attribute i?*)

Strategy # 3 - Pricing

Analysis 1- Do people think YB toothpaste is expensive?

Method: Two Dependent Mean Comparison

Hypothesis: Do people think YB toothpaste price higher than they expected?

- Toothpaste=-0.09
- YB toothpaste=1.08

D=Toothpaste-YB toothpaste

Ho: D = 0

H1: D≠ 0

Test statistic: t(127)=-8.845, p<0.01

since p<0.05, reject the H0 that D=0 and support H1

Conclusion: People think YB toothpaste price is higher than they expected.

Strategy # 3 - Pricing

Research Q2 - Which products people would like to purchase along with YB?

Method: One-Sample T-Test

Q: If toothpaste products are being offered in bundles, how likely are you to buy them with the following oral care products: (interval scale)

a. Mouthwash
b. Floss
c. Toothbrush
d. Whitestrips
e. Mouth freshener

1 ---------2---------3---------4---------5---------6---------7

Extremely Unlikely Extremely likely

Q: If Yunnan Baiyao toothpaste is being offered in bundles, how likely are you to buy it together with the following Yunnan Baiyao products: (interval scale)

a. Yunnan Baiyao hair product series
b. Yunnan Baiyao food series
c. Yunnan Baiyao skin care series
d. Yunnan Baiyao medicine series

1 ---------2---------3---------4---------5---------6---------7

Extremely Unlikely Extremely likely

Strategy # 3 - Pricing

Research Q2 - Which products people would like to purchase along with YB?

Method: One-Sample T-Test

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
WithMouthwash	128	4.83	1.815	.160
WithFloss	128	4.45	1.601	.142
WithToothbrush	128	4.90	1.706	.151
WithWhitestrips	128	4.09	1.944	.172
WithFreshener	128	4.45	1.626	.144
WithHairProd	128	4.21	2.080	.184
WithFoodProd	128	3.48	1.827	.161
WithSkinCare	128	3.73	1.751	.155
WithMedicine	128	4.47	1.840	.163

One-Sample Test

Test Value = 4

	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference Lower	Upper
WithMouthwash	5.163	127	.000	.828	.51	1.15
WithFloss	3.146	127	.002	.445	.17	.73
WithToothbrush	5.958	127	.000	.898	.60	1.20
WithWhitestrips	.500	127	.618	.086	-.25	.43
WithFreshener	3.153	127	.002	.453	.17	.74
WithHairProd	1.148	127	.253	.211	-.15	.57
WithFoodProd	-3.193	127	.002	-.516	-.84	-.20
WithSkinCare	-1.767	127	.080	-.273	-.58	.03
WithMedicine	2.883	127	.005	.469	.15	.79

(If the population mean score is greater than 4, we can assume that they have tendency to make purchase with)

Strategy # 3 - Pricing

Analysis - Which products people would like to purchase along with YB?

Method: One-Sample T-Test

Hypothesis: Is the average likelihood of purchase for mouthwash-1/floss-2/toothbrush-3/whitestrips-4/mouth freshener-5/YB hair product series-6/YB food series-7/YB skin care series-8/YB medicine series-9 different from 4, respectively?

X=true value (in population)

H0:X=4, H1:X≠4

Test statistic: t1(127)=5.163, p1<0.01, t2(127)=3.146, p2=0.002, t3(127)=5.958, p3<0.01, t4(127)=0.5, p4=0.618, t5(127)=3.153, p5=0.002, t6(127)=1.148, p6=0.253, t7(127)=-3.193, p7=0.002,, t8(127)= -1.767, p=0.08, t9(127)=2.883, p=0.005
Since p1, p2, p3, p5, p7, p9 < 0.05, we can reject Ho, and support H1
Since p4, p6, p8, > 0.05, we cannot reject Ho, cannot report H1

Conclusion: The likely purchase score for mouthwash, floss, toothbrush, mouth freshener, YB medicine series are significantly bigger than 4, the likely purchase score for YB food series is significantly smaller than 4, the likely purchase score for whitestrips, hair product series and skin care product are not significantly different from 4.

Strategy # 3 - Pricing

Research Q3 - Do people who have different preferences for purchasing toothpaste type are different in bundle product purchase behavior?

Method: ANOVA

Q: If toothpaste products are being offered in bundles, how likely are you to buy them with the following oral care products? (interval scale)

a. Mouthwash
b. Floss
c. Toothbrush
d. Mouth freshener

1—--------2—--------3—--------4—-------5—-------6—--------7
Extremely Unlikely Extremely likely

Q: If Yunnan Baiyao toothpaste is being offered in bundles, how likely are you to buy it together with the following Yunnan Baiyao products? (interval scale)

a. Yunnan Baiyao medicine series

1—--------2—--------3—--------4—-------5—-------6—--------7
Extremely Unlikely Extremely likely

Q: What type of toothpaste do you buy the most? (nominal scale)

a. Professional Treatment Toothpaste
b. Professional Whitening Toothpaste
c. Purchase Both Type
d. No Preference

Strategy # 3 - Pricing

Research Q3 - Do people who have different preferences for purchasing toothpaste type are different in bundle product purchase behavior?

Method: ANOVA

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
WithMouthwash	Between Groups	33.450	3	11.150	3.593	.016
	Within Groups	384.769	124	3.103		
	Total	418.219	127			
WithFloss	Between Groups	4.319	3	1.440	.556	.645
	Within Groups	321.299	124	2.591		
	Total	325.617	127			
WithToothbrush	Between Groups	26.099	3	8.700	3.140	.028
	Within Groups	343.581	124	2.771		
	Total	369.680	127			
WithFreshener	Between Groups	13.521	3	4.507	1.735	.163
	Within Groups	322.198	124	2.598		
	Total	335.719	127			
WithMedicine	Between Groups	33.271	3	11.090	3.467	.018
	Within Groups	396.604	124	3.198		
	Total	429.875	127			

Descriptives

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
WithMouthwash	Professional treatment toothpaste, i.e. prevent tooth decay/anti-sensitivity	37	4.81	1.823	.300	4.20	5.42	1	7
	Professional whitening toothpaste	25	5.52	1.447	.289	4.92	6.12	1	7
	Purchase both types of toothpastes	35	5.06	1.589	.269	4.51	5.60	1	7
	No preference	31	4.03	2.073	.372	3.27	4.79	1	7
	Total	128	4.83	1.815	.160	4.51	5.15	1	7
WithToothbrush	Professional treatment toothpaste, i.e. prevent tooth decay/anti-sensitivity	37	5.24	1.706	.281	4.67	5.81	1	7
	Professional whitening toothpaste	25	5.04	1.541	.308	4.40	5.68	2	7
	Purchase both types of toothpastes	35	4.17	1.886	.319	3.52	4.82	1	7
	No preference	31	5.19	1.424	.256	4.67	5.72	1	7
	Total	128	4.90	1.706	.151	4.60	5.20	1	7
WithMedicine	Professional treatment toothpaste, i.e. prevent tooth decay/anti-sensitivity	37	4.86	1.782	.293	4.27	5.46	1	7
	Professional whitening toothpaste	25	4.76	1.715	.343	4.05	5.47	1	7
	Purchase both types of toothpastes	35	4.63	1.716	.290	4.04	5.22	1	7
	No preference	31	3.58	1.928	.346	2.87	4.29	1	7
	Total	128	4.47	1.840	.163	4.15	4.79	1	7

Strategy # 3 - Pricing

Analysis 3.1 - Do people who have different preferences for purchasing toothpaste type are different in bundle product purchase behavior?

Method: ANOVA

Hypothesis: Do people who have different preferences for purchasing toothpaste type are different in bundle product purchase behavior(toothpaste with mouthwash-1/floss-2/toothbrush-3/freshener-4/medicine-5)?

H0: Treatment = Whitening = Both types = No preference
H1: Not all of them are the same

Test Statistic: F1(3,124)=3.593, p1=0.016 (11.15/3.103=3.593), F2(3,124)=0.556, p2=0.645(1.44/2.591),
F3(3,124)=3.14, p3=0.028(8.7/2.771), F4(3,124)=1.735, p4=0.163(4.507/2.598),
F5(3,124)=3.467, p5=0.018(11.09/3.198)
Since p1, p3, p5<0.05, we can reject H0 and support H1
Since p2, p4 >0.05, we cannot reject H0, cannot report H1

Conclusion: There are significant differences among group for people who like to purchase mouthwash, toothbrush and medicine. Not all of them are the same; there are no significant differences among group for floss and freshener purchase behavior

Strategy # 3 - Pricing

Analysis 3.2- Do people who have different preferences for purchasing toothpaste type are different in bundle product purchase behavior?

Method: ANOVA

Multiple Comparisons

Dependent Variable		(I) Toothpaste_Type	(J) Toothpaste_Type	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
WithMouthwash	Tukey HSD	Professional treatment toothpaste, i.e. prevent tooth decay/anti-sensitivity	Professional whitening toothpaste	-.709	.456	.408	-1.90	.48
			Purchase both types of toothpastes	-.246	.415	.934	-1.33	.84
			No preference	.779	.429	.271	-.34	1.90
		Professional whitening toothpaste	Professional treatment toothpaste, i.e. prevent tooth decay/anti-sensitivity	.709	.456	.408	-.48	1.90
			Purchase both types of toothpastes	.463	.461	.748	-.74	1.66
			No preference	1.488*	.474	.011	.25	2.72
		Purchase both types of toothpastes	Professional treatment toothpaste, i.e. prevent tooth decay/anti-sensitivity	.246	.415	.934	-.84	1.33
			Professional whitening toothpaste	-.463	.461	.748	-1.66	.74
			No preference	1.025	.434	.091	-.11	2.16
		No preference	Professional treatment toothpaste, i.e. prevent tooth decay/anti-sensitivity	-.779	.429	.271	-1.90	.34
			Professional whitening toothpaste	-1.488*	.474	.011	-2.72	-.25
			Purchase both types of toothpastes	-1.025	.434	.091	-2.16	.11
WithToothbrush	Tukey HSD	Professional treatment toothpaste, i.e. prevent tooth decay/anti-sensitivity	Professional whitening toothpaste	.203	.431	.965	-.92	1.33
			Purchase both types of toothpastes	1.072*	.392	.036	.05	2.09
			No preference	.050	.405	.999	-1.01	1.11
		Professional whitening toothpaste	Professional treatment toothpaste, i.e. prevent tooth decay/anti-sensitivity	-.203	.431	.965	-1.33	.92
			Purchase both types of toothpastes	.869	.436	.196	-.27	2.00
			No preference	-.154	.447	.986	-1.32	1.01
		Purchase both types of toothpastes	Professional treatment toothpaste, i.e. prevent tooth decay/anti-sensitivity	-1.072*	.392	.036	-2.09	-.05
			Professional whitening toothpaste	-.869	.436	.196	-2.00	.27
			No preference	-1.022	.411	.066	-2.09	.05
		No preference	Professional treatment toothpaste, i.e. prevent tooth decay/anti-sensitivity	-.050	.405	.999	-1.11	1.01
			Professional whitening toothpaste	.154	.447	.986	-1.01	1.32
			Purchase both types of toothpastes	1.022	.411	.066	-.05	2.09
WithMedicine	Tukey HSD	Professional treatment toothpaste, i.e. prevent tooth decay/anti-sensitivity	Professional whitening toothpaste	.105	.463	.996	-1.10	1.31
			Purchase both types of toothpastes	.236	.422	.944	-.86	1.33
			No preference	1.284*	.435	.020	.15	2.42
		Professional whitening toothpaste	Professional treatment toothpaste, i.e. prevent tooth decay/anti-sensitivity	-.105	.463	.996	-1.31	1.10
			Purchase both types of toothpastes	.131	.468	.992	-1.09	1.35
			No preference	1.179	.481	.073	-.07	2.43
		Purchase both types of toothpastes	Professional treatment toothpaste, i.e. prevent tooth decay/anti-sensitivity	-.236	.422	.944	-1.33	.86
			Professional whitening toothpaste	-.131	.468	.992	-1.35	1.09
			No preference	1.048	.441	.087	-.10	2.20
		No preference	Professional treatment toothpaste, i.e. prevent tooth decay/anti-sensitivity	-1.284*	.435	.020	-2.42	-.15
			Professional whitening toothpaste	-1.179	.481	.073	-2.43	.07
			Purchase both types of toothpastes	-1.048	.441	.087	-2.20	.10

Strategy # 3 - Pricing

Analysis 3.2- Do people who have different preferences for purchasing toothpaste type are different in bundle product purchase behavior?

Method: ANOVA

Mouthwash

-> Whitening > No preference, p=0.011, people who prefer buying whitening type of toothpaste are more likely to purchase mouthwash with toothpaste han people who don't have preference on choosing toothpaste type.

-> Other groups are not significantly different, p>0.05

Toothbrush

-> Treatment > Both types, p=0.036, people who prefer buying treatment type of toothpaste are more likely to purchase toothbrush with toothpaste than people who prefer purchase both types of toothpaste.

-> Other groups are not significantly different, p>0.05

Medicine series

-> Treatment > No preference, p=0.02, people who prefer buying treatment type of toothpaste are more likely to purchase YB medicine product with toothpaste than people who don't have preference on choosing toothpaste type.

-> Other groups are not significantly different, p>0.05

Strategy # 3 - Recommendations To Yunnan Baiyao

Findings Obtained from Analysis → **One Unified Strategy**

- **Finding 1:**

  YB toothpaste => Expensive

- **Finding 2:**

  Mouthwash, Floss, Toothbrush, Mouth Freshener, YB medicine series + YB toothpaste => Purchase together

- **Finding 3:**

  For Mouthwash, Purchase likelihood (whitening type) > Purchase likelihood (no preference)

  For Toothbrush, Purchase likelihood (treatment type) > Purchase likelihood (both type)

  For YB medicine series product, Purchase likelihood (treatment type) > Purchase likelihood (no preference)

To trigger price conscious people to buy YB product => **Offer product bundling**

- Set a price that is cheaper than buying each product separately

- Bundle Sale - YB Toothpaste + Mouthwash/Floss/Toothbrush/Freshener /YB Medicine Series Product

- More Bundle set on:
  - Whitening + Mouthwash
  - Treatment + Toothbrush
  - Treatment + Medicine Product

Strategy # 3 - Recommendations To Yunnan Baiyao

Product Bundle

Type 1
(Whitening + Mouthwash)

Type 2
(Treatment + Toothbrush)

Type 3
(Treatment + Toothbrush)

Strategy # 4 - Promotion & Place

Research Q1 - Can people fully experience a new toothpaste before buy it?

Method: One Proportion Test

Question used for analysis

Q: Can you fully experience a new toothpaste before you buy it? (new function, flavor, etc.)
A: NO (=1)
B: Yes (=0)

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Fully_Experienced_Binomial	128	0	1	.74	.439
Valid N (listwise)	128				

Binomial Test

	Category	N	Observed Prop.	Test Prop.	Exact Sig. (1-tailed)
Fully_Experienced_Binomial	Group 1	1	95	.74	.524
	Group 2	0	33	.26	
	Total		128	1.00	

Two Hypotheses

- Ho: The percentage of [Fully_Experiebced_Binomial] = 74%
- H1: The percentage of [Fully_Experiebced_Binomial] ≠ 74%

Results

- P = 0.524 > 0.05
- Cannot reject Ho

Conclusion

- We can conclude that **about 74% of people cannot fully experience a new toothpaste before buying and trying it.**

Strategy # 4 - Promotion & Place

Research Q2 - Set up disposable toothpaste vending machines at shopping mall catering area

Method: Correlation

Question used for analysis

Q: Please state your opinion on the following scale:
I have a great need to clean my mouth after eating out
1 -------2------3------4------5------6-------7
Extremely Disagree Extremely Agree

Q: How likely are you to use a disposable toothpaste set if it is available in a shopping mall/restaurant bathroom?
1 -------2------3—----4------5------6-------7
Extremely Impossible Extremely Possible

Q: If the vending machines in the catering area of the shopping mall offer disposable Yunnan Baiyao toothpaste sets, how much would you be willing to pay for them? (1~10 RMB)

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Outside_Need	128	1	7	4.41	1.700
Possiblility_to_Use	128	1	7	4.28	1.848
Price_Acceptable	128	0	7	2.84	1.560
Valid N (listwise)	128				

Correlations

		Outside_Need	Possiblility_to_Use	Price_Acceptable
Outside_Need	Pearson Correlation	1	.354**	.639**
	Sig. (2-tailed)		.000	.000
	N	128	128	128
Possiblility_to_Use	Pearson Correlation	.354**	1	.622**
	Sig. (2-tailed)	.000		.000
	N	128	128	128
Price_Acceptable	Pearson Correlation	.639**	.622**	1
	Sig. (2-tailed)	.000	.000	
	N	128	128	128

Conclusion

The correlation of the three variables shows that **those who have high need to clean mouth after eating out are more tended to use disposable toothpaste and can also accept relatively high price.**

Strategy # 4 - Promotion & Place

Research Q3 - Pricing the disposable toothpaste

Method: One Mean Test

- The mean value of [Price_Acceptable] is 2.81.
- In fact, we do not need to consider the advice that are from those who do not want use disposable toothpaste after eating out.
- So, we can only focus on the data when [Possibility_to_Use] =4, 5, 6, 7

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Price_Acceptable	87	3.33	1.291	.138

Two Hypotheses

- Ho: mean value of [Price_Acceptable] = 3.33
- H1: mean value of [Price_Acceptable]≠ 3.33

One-Sample Test

Test Value = 3.33

	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Price_Acceptable	.024	86	.981	.003	-.27	.28

Results

- The **confidence interval is [3.06, 3.61].**

Conclusion

- By 95% of confidence interval, a price between **3.06 and 3.61 RMB will be acceptable**

Strategy # 4 - Recommendations To Yunnan Baiyao

Findings Obtained from Analysis → **One Unified Strategy**

- **Finding 1:** There are around **74%** people cannot fully experience a new toothpaste before they try it.
- **Finding 2:** Those who **really need** to clean mouth after eating out are **more likely to use** disposable toothpaste and can also accept **relatively high price**.
- **Finding 3:** Consumers in high demand are willing to buy disposable toothpaste at **[3.06, 3.61]** RMB.

- Considering that we often use disposable toothpaste sets in hotels, which are cheap and convenient to use. **Setting up disposable toothpaste vending machines in the catering area of the mall,** helping customers try toothpaste with various functions and flavors is feasible.
- we decide to price at **3.5 RMB**.

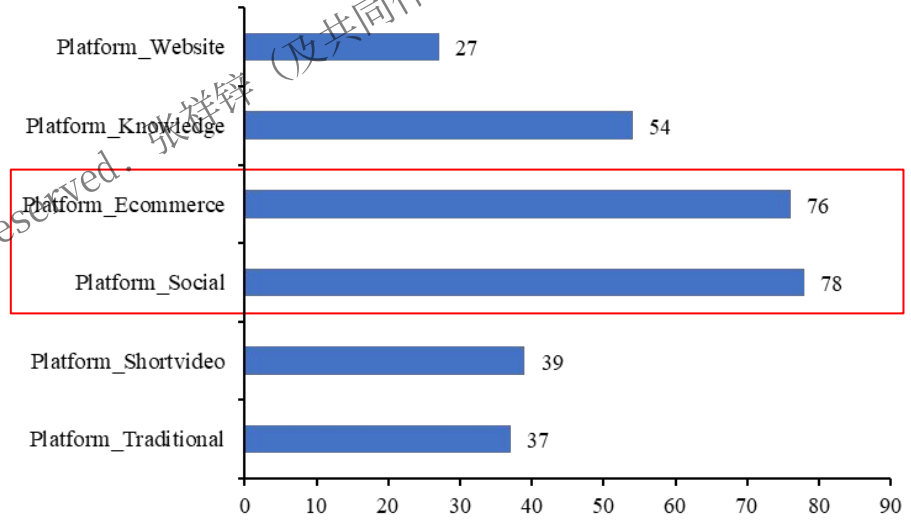
Strategy # 5 - Celebrity Endorsement

Research Q1 - Which channel should be selected for promotion?

Questions used for analysis

Q: What platforms do you usually refer to when buying toothpaste?
(Nominal: Yes/No)

1. Traditional media (Television, newspapers, magazines)
2. Short video platforms (TikTok)
3. Social media (The Red, Weibo, WeChat official account)
4. E-commerce platforms (Taobao, Jindong, Pinduoduo)
5. Knowledge sharing community (Baidu Zhizhi, Zhihu, Douban)
6. Official website



The two channels with the largest number are social platforms and e-commerce platforms, with 78 and 76 respectively.

Strategy # 5 - Celebrity Endorsement

Research Q1 - Which channel should be selected for promotion?

Method: One Proportion Test

Binomial Test

		Category	N	Observed Prop.	Test Prop.	Exact Sig. (2-tailed)
Platform_Social	Group 1	1	78	.61	.50	.017
	Group 2	0	50	.39		
	Total		128	1.00		

Hypothesis:

x = % of people refer to social platforms

Ho: x = 50%, H1: x ≠ 50%

Test Statistics:

P = 0.017 < 0.05, reject Ho. —>

More than 50% of people refer to social platforms when buying toothpaste.

Binomial Test

		Category	N	Observed Prop.	Test Prop.	Exact Sig. (2-tailed)
Platform_Ecommerce	Group 1	0	52	.41	.50	.042
	Group 2	1	76	.59		
	Total		128	1.00		

Hypothesis:

x = % of people refer to e-commerce platforms

Ho: x = 50%, H1: x ≠ 50%

Test Statistics:

P = 0.042 < 0.05, reject Ho. —>

More than 50% of people refer to e-commerce platforms when buying toothpaste.

Conclusion 1: When buying toothpaste, more than 50% of people refer to information from e-commerce platforms or social platforms, **indicating that such channels are worthy of relevant advertising.**

Strategy # 5 - Celebrity Endorsement

Research Q2 - How does the effect of spokesmen or bloggers work?

Questions used for analysis

Q1: What platforms do you usually refer to when buying toothpaste?

Social media (Nominal: Yes/No)

E-commerce platforms (Nominal: Yes/No)

Q2: To what extent do you follow the advice of the platform's bloggers when choosing toothpaste? (Interval)

1———2 ——— 3 ——— 4 ——— 5 ——— 6 ——— 7

Not at all — Completely Follow

Q3: To what extent does a brand spokesperson influence your choice of toothpaste? (Interval)

1———2 ——— 3 ——— 4 ——— 5 ——— 6 ——— 7

Not at all — Completely Influence

1) Whether consumers who use certain platform are more likely to be influenced by endorsers or bloggers?

Q1: To what extent does a brand spokesperson influence your choice of toothpaste? (Interval)

1———2 ——— 3 ——— 4 ——— 5 ——— 6 ——— 7

Not at all — Completely Influence

Q2: To what extent do these adjectives describe you? (Interval)

Generous:

1———2 ——— 3 ——— 4 ——— 5 ——— 6 ——— 7

Not at all — Completely True

2) What are the behavioral features of the consumers?

Strategy # 5 - Celebrity Endorsement

Research Q2-1 - Whether consumers who use certain platform are more likely to be influenced by endorsers or bloggers?

Method: Two independent-means Comparison

Social Platform

Group Statistics

	Platform_Social	N	Mean	Std. Deviation	Std. Error Mean
SpokesmanEffect	1	78	3.49	1.836	.208
	0	50	3.42	1.896	.268

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference Lower	Upper
SpokesmanEffect	Equal variances assumed	.216	.643	.199	126	.842	.067	.337	-.599	.734
	Equal variances not assumed			.198	102.111	.843	.067	.339	-.606	.740

Group Statistics

	Platform_Social	N	Mean	Std. Deviation	Std. Error Mean
BloggersEffect	1	78	4.76	1.513	.171
	0	50	4.22	1.951	.276

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference Lower	Upper
BloggersEffect	Equal variances assumed	5.737	.018	1.745	126	.084	.536	.307	-.072	1.145
	Equal variances not assumed			1.651	85.943	.102	.536	.325	-.109	1.182

Hypothesis (Spokesmen Effect):

x = people do not refer to social platforms

y = people refer to social platforms

Ho: x = y, H1: x ≠ y

Test Statistics:

P = 0.842 > 0.05, cannot reject Ho. —> Cannot conclude that people refer to social platforms are more likely to be influenced by spokesmen.

Hypothesis (Bloggers Effect):

Ho: x = y, H1: x ≠ y

Test Statistics:

P = 0.084 > 0.05, cannot reject Ho. —> Cannot conclude that people refer to social platforms are more likely to be influenced by bloggers.

Strategy # 5 - Celebrity Endorsement

Research Q2-1 - Whether consumers who use certain platform are more likely to be influenced by endorsers or bloggers?

Method: Two independent-means Comparison

E-commerce Platform

Group Statistics

	Platform_Ecommerce	N	Mean	Std. Deviation	Std. Error Mean
SpokesmanEffect	0	52	2.98	1.754	.243
	1	76	3.79	1.857	.213

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference Lower	Upper
SpokesmanEffect	Equal variances assumed	.001	.978	-2.474	126	.015	-.809	.327	-1.456	-.162
	Equal variances not assumed			-2.501	113.717	.014	-.809	.323	-1.449	-.168

Group Statistics

	Platform_Ecommerce	N	Mean	Std. Deviation	Std. Error Mean
BloggersEffect	0	52	4.37	1.941	.269
	1	76	4.74	1.518	.174

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference Lower	Upper
BloggersEffect	Equal variances assumed	5.488	.021	-1.527	126	.129	-.468	.306	-1.074	.139
	Equal variances not assumed			-1.459	91.664	.148	-.468	.321	-1.104	.169

Hypothesis (Spokesmen Effect):

x = people do not refer to e-commerce platforms

y = people refer to e-commerce platforms

Ho: x = y, H1: x ≠ y

Test Statistics:

P = 0.015 < 0.05, reject Ho. —> **People that refer to e-commerce platforms are more likely to be influenced by spokesmen.**

Hypothesis (Bloggers Effect):

Ho: x = y, H1: x ≠ y

Test Statistics:

P = 0.129 > 0.05, cannot reject Ho. —> Cannot conclude that people refer to e-commerce platforms are more likely to be influenced by bloggers.

Strategy # 5 - Celebrity Endorsement

Research Q2-2 - What are the behavioral features of the consumers?

Method: Correlation

Correlations

		品牌代言人在多大程度上会影响您对牙膏的选择？	Generous 请问以下这些形容词在多大程度上能描述您？:慷慨大方的
品牌代言人在多大程度上会影响您对牙膏的选择？ SpokesmanEffect	Pearson Correlation	1	.274**
	Sig. (2-tailed)		.002
	N	128	128
请问以下这些形容词在多大程度上能描述您？:慷慨大方的	Pearson Correlation	.274**	1
	Sig. (2-tailed)	.002	
	N	128	128

**. Correlation is significant at the 0.01 level (2-tailed).

Hypothesis:

r = correlation between *SpokesmanEffect* and *Generous*

Ho: r = 0, H1: r ≠ 0

Test Statistics:

P = 0.002 < 0.05, reject Ho. —>

SpokesmanEffect and *Generous* are positively correlated, thus **those who are likely to be influenced by spokesmen tend to be more generous.**

Conclusion 2: Increasing the publicity of spokesmen on **e-commerce platforms** can better stimulate potential consumers, and these consumers are likely to **spend more money**.

Strategy # 5 - Celebrity Endorsement

Research Q3 - What kind of promotion form to choose?

Questions used for analysis

Method: Paired Sample T Test

Q: When choosing toothpaste, to what extent do you accept the following promotion forms?
1.Texts with pictures (Interval)
1—————2 ————— 3 ————— 4 ————— 5 ————— 6 ————— 7
Extremely Unacceptable Extremely Acceptable
2.Short video (Interval)
1—————2 ————— 3 ————— 4 ————— 5 ————— 6 ————— 7
Extremely Unacceptable Extremely Acceptable
3.Live streaming (Interval)
1—————2 ————— 3 ————— 4 ————— 5 ————— 6 ————— 7
Extremely Unacceptable Extremely Acceptable

Hypothesis:
Ho: Shortvideo - Live = 0
H1: Shortvideo- Live ≠ 0
Test Statistics:
P < 0.001 < 0.05, reject Ho. —> People are more willing to adopt the promotion form of short videos than live streaming.

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	PromotionForm_Shortvideo	4.91	128	1.622	.143
	PromotionForm_Live	3.76	128	1.640	.145

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	PromotionForm_Shortvideo - PromotionForm_Live	1.156	1.544	.136	.886	1.426	8.471	127	<.001

Strategy # 5 - Celebrity Endorsement

Research Q3 - What kind of promotion form to choose?

Method: Paired Sample T Test

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	PromotionForm_PictureText	5.31	128	1.266	.112
	PromotionForm_Shortvideo	4.91	128	1.622	.143

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	PromotionForm_PictureText - PromotionForm_Shortvideo	.398	1.460	.129	.143	.654	3.088	127	.002

Hypothesis:

Ho: PictureText - Shortvideo = 0

H1: PictureText - Shortvideo ≠ 0

Test Statistics:

P = 0.002 < 0.05, reject Ho. —>

People are more willing to adopt the promotion form of texts with pictures than short videos.

PictureText > Shortvideo > Live

Conclusion 3: When buying toothpaste, people are more willing to adopt the content promoted in the form of **pictures and texts** than short videos and live streaming. It shows that during the purchase, **the simpler the promotion form, the better the effectiveness.**

Strategy # 5 - Recommendations To Yunnan Baiyao

Findings Obtained from Analysis → **One Unified Strategy**

When buying toothpaste:

- **Finding 1:** More than 50% of people refer to information from e-commerce platforms or social platforms.
- **Finding 2:** People who use e-commerce platforms to seek information are more likely to be influenced by spokesmen.
- **Finding 3:** People who are likely to be influenced by spokesmen tend to be more generous.
- **Finding 4:** People preferring simpler promotion forms like texts and pictures.

Current layout

Redesigned layout

➢ **Strategy: It is more efficient to use spokesmen's pictures on the landing page on e-commerce platforms for promotion.**

Strategy #6 - Co-Branding

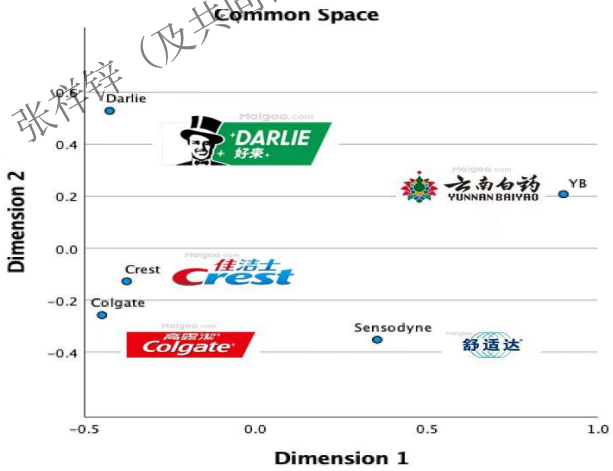
Research Q1 -what is the customer perception for each brand？

Questions used for analysis

Q: Please evaluate the brand similarity according to your understanding of the brand (interval, 1= completely different, 7= exactly the same)

1. YB VS Darlie
2. YB VS Colgate
3. YB VS Sensodyne
4. YB VS Crest
5. Darlie VS Colgate
6. Darlie VS Crest
7. Darlie VS Sensodyne
8. Colgate VS Crest
9. Colgate VS Sensodyne
10. Crest VS Sensodyne

Method: MDS



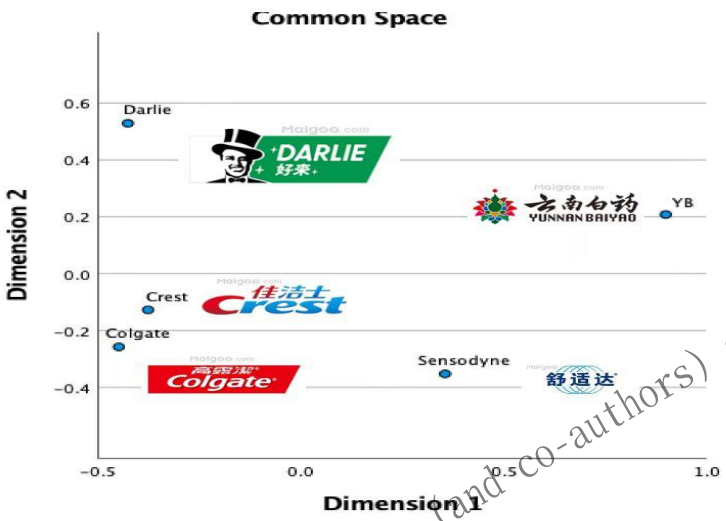
Our Assumption:

Dimension 1 is price

Dimension 2 is familiarity

Strategy # 6 - Co-Branding

Research Q2.2 -Define dimensions 1 as price



Method: Collect secondary data

Dimension1: Price

The price range of each toothpaste brand

DARLIE 好来	Colgate 高露洁	Crest	舒适达	云南白药牙膏
12.9 ~ 49RMB	19.9 ~ 84	12.9 ~ 39.9	21 ~ 52	34.2 ~ 99.9

Conclusion:

YB's price range is highest

Each brand's price range matches the perception map

Strategy # 6 - Co-Branding

Research Q2.1 -Define dimensions 2 as Familiarity

Method: Paired-Sample T Test (Extra survey, S=19)

Questions used for analysis

Q: According to the previous acknowledge, how familiar are you with Darlie, YB, Colgate, Crest, Sensodyne toothpaste brand? (interval)

1 —-----2—-----3—-----4—---5—---6—-----7

No idea Average Level Very familiar

Conclusion:

Dimension2: Familiarity

Toothpaste Brand Rank

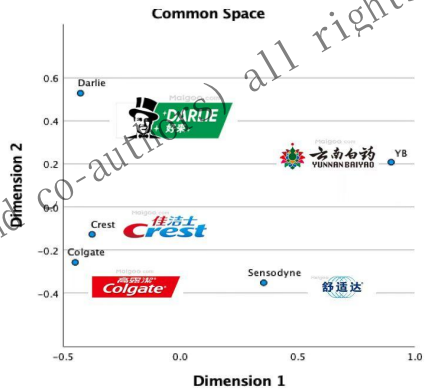
1> Darlie

2>YB

3>Colgate

4>Crest

5>Sensodyne



Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Darlie	6.85	20	.366	.082
	YB	6.00	20	.795	.178
Pair 2	Darlie	6.85	20	.366	.082
	Colgate	4.95	20	.686	.153
Pair 3	Darlie	6.85	20	.366	.082
	Crest	4.20	20	.834	.186
Pair 4	Darlie	6.85	20	.366	.082
	Sensody	2.15	20	1.040	.233
Pair 5	YB	6.00	20	.795	.178
	Colgate	4.95	20	.686	.153
Pair 6	YB	6.00	20	.795	.178
	Crest	4.20	20	.834	.186
Pair 7	YB	6.00	20	.795	.178
	Sensody	2.15	20	1.040	.233
Pair 8	Colgate	4.95	20	.686	.153
	Crest	4.20	20	.834	.186
Pair 9	Colgate	4.95	20	.686	.153
	Sensody	2.15	20	1.040	.233
Pair 10	Crest	4.20	20	.834	.186
	Sensody	2.15	20	1.040	.233

Test statistic:

All p < .05 so reject All Ho that D = 0

(Darlie – YB = 0)

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
r 1	Darlie – YB	.850	.933	.209	.413	1.287	4.073	19	<.001
r 2	Darlie – Colgate	1.900	.641	.143	1.600	2.200	13.262	19	<.001
r 3	Darlie – Crest	2.650	.745	.167	2.301	2.999	15.904	19	<.001
r 4	Darlie – Sensody	4.700	1.081	.242	4.194	5.206	19.445	19	<.001
r 5	YB – Colgate	1.050	.999	.223	.583	1.517	4.702	19	<.001
r 6	YB – Crest	1.800	1.056	.236	1.306	2.294	7.621	19	<.001
r 7	YB – Sensody	3.850	1.268	.284	3.257	4.443	13.578	19	<.001
r 8	Colgate – Crest	.750	.639	.143	.451	1.049	5.252	19	<.001
r 9	Colgate – Sensody	2.800	.951	.213	2.355	3.245	13.161	19	<.001
r 10	Crest – Sensody	2.050	.887	.198	1.635	2.465	10.335	19	<.001

Hypothesis:

Pair 1 Hypothesis:
Ho: Darlie-YB=0
H1: Darlie-YB ≠0

Pair 2 Hypothesis:
Ho: Darlie-Colgate=0
H1: Darlie-Colgate ≠0

Pair 3 Hypothesis:
Ho: Darlie-Crest=0
H1: Darlie-Crest ≠0

Pair 4 Hypothesis:
Ho: Darlie-Sensody=0
H1: Darlie-Sensody ≠0

Pair 5 Hypothesis:
Ho: YB-Colgate=0
H1: YB-Colgate≠0

Pair 6 Hypothesis:
Ho: YB-Crest=0
H1: YB-Crest≠0

Pair 7 Hypothesis:
Ho: YB-Sensody=0
H1: YB-Sensody≠0

Pair 8 Hypothesis:
Ho: Colgate-Crest=0
H1: Colgate-Crest≠0

Pair 9 Hypothesis:
Ho: Colgate-Sensodyne=0
H1: Colgate-Sensodyne≠0

Pair 10 Hypothesis:
Ho: Crest-Sensodyne=0
H1: Crest-Sensodyne≠0

Strategy # 6 - Co-Branding

Research Q3.1 - How should we improve YB branding strategy？

Questions used for analysis

Q:Which of the following brands can attract your interest when Yunnan Baiyao toothpaste cooperates with them? (Nominal scale)

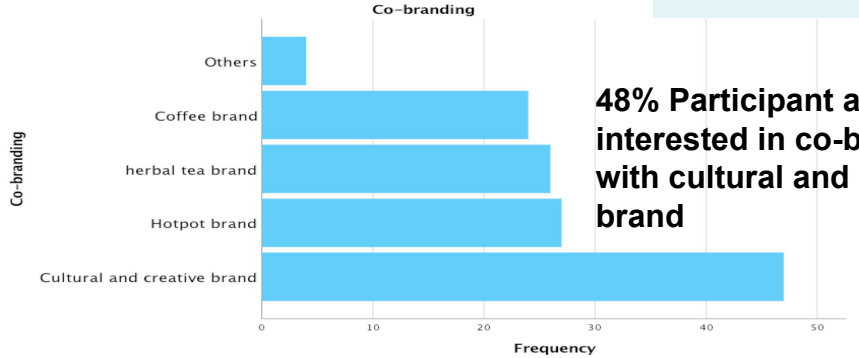
1>YB & Culture and creative brand (The Palace Museum, Yunnan Nationalities Village)

2>YB & Hotpot brand (HaiDilao)

3>YB & Herbal team brand (Wang Lo Kat)

4>YB & Coffee (Luckin coffee)

5>Other



48% Participant are interested in co-branding with cultural and creative brand

Strategy # 6 - Co-Branding

Research Q3.2- How should we design co-branding campaign

Method: Cross-tabulation

The most frequently purchased toothpaste * Co-branding Crosstabulation

		Co-branding				
		Cultural and creative brand	Hotpot brand	herbal tea brand	Coffee brand	Others
The most frequently purchased toothpaste	Treatment function	32.4%	10.8%	21.6%	32.4%	2.7%
	Whitening function	40.0%	12.0%	16.0%	32.0%	0.0%
	Both	37.1%	25.7%	28.6%	5.7%	2.9%
	No perference	38.7%	35.5%	12.9%	6.5%	6.5%
Total		36.7%	21.1%	20.3%	18.8%	3.1%

Questions used for analysis

Q2:What kind of toothpaste do you buy most often? (Nominal scale)

1> Treatment function

2>Whitening function

3>Both

4>No preference

Test statistic:

P=0.033<0.05 statistic significant

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	22.415[a]	12	.033
Likelihood Ratio	23.971	12	.021
Linear-by-Linear Association	4.339	1	.037
N of Valid Cases	128		

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Contingency Coefficient	.386	.033
N of Valid Cases		128	

Conclusion:

People interested in cooperation between "YB" & "cultural and creative brand" purchase whitening function toothpaste most frequently

Strategy #6 - Recommendations To Yunnan Baiyao

Findings Obtained from Analysis → **One Unified Strategy**

Finding 1:
people will perceive YB's brand image as higher price and medium familiarity

Finding 2:
48% Participant are interested in Co-branding with **cultural and creative brand**

Finding 3:
People who purchase whitening function toothpaste frequently, show the preference of Co-branding with **cultural and creative brand**

Competition-Wise

➔ **Direct competitor:**

Sensodyne (price dimension)

Monitor Sensodyne' s **pricing strategy**

Darlie (familiarity dimension)

Monitor Darlie' s **advertising exposure strategy**

➔ **Long distance competitor:**

Preemptive positioning strategy/Being the first to claim a benefit/chinese herb feature

Cooperation-wise

➔ **Work with The palace museum** to launch a **whitening function toothpaste** with **The Palace Museum**

Strategy # 7 - Brand Image

A Potential Win-Win Strategy with OEM Hotel Toothpaste

Why should Yunnan Baiyao consider this strategy?

➢ **A promising branding booster**

- Make the brand image better
- Enhance brand awareness and loyalty
- Increase purchase intention

Why should hotels consider this strategy?

➢ **A low-cost "ingredient branding" (external source)**

- Easily changeable
- Toiletries* are the 3rd most important in-room amenities
- **Only 25.6% could recall brand names**
- **53.2% reported that toiletries were the most preferable amenities** if they could receive branded ones

Source: Kim, E. (2017). Impact of Ingredient Branding on the Hotel Brand: Spillover Effect of Branded Amenities. Digital Scholarship@UNLV. Retrieved 2 April 2022, from http://dx.doi.org/10.34917/11156736.

A demo of OEM toothpaste
(eg. Mandarin Oriental Hotel)

A typical non-branded hotel-provided toothpaste (HPT)

*Toiletries include hair products, soap, bath products, etc.

Strategy # 7 - Brand Image

Method: Independent Samples T Test (two independent means)

Research Q1a - Is Branding Effect of Hotel Cooperation the Same Across Segments?

Questions used for analysis

Q: Have you ever noticed or used hotel-provided toothpaste? (nominal, single choice)

Yes/No

Q: If YB provides toothpaste for high-end hotels, how will it impact YB in terms of brand image? (interval)

1 —-----2—-----3—-----4—---5—---6—-----7

Very Negative Indifferent Very Positive

Noticedhotel

Group Statistics

请问您有注意到或使用过酒店提供的牙膏吗？		N	Mean	Std. Deviation	Std. Error Mean
目前市面上，两面针是主流的酒店牙膏品牌之一，如果云南白药牙膏为高端酒店提供定制款牙膏，您认为这将对云南白药牙膏的品牌形象有什么影响？	有 Yes	106	5.21	1.293	.126
	没有 No	22	4.50	1.766	.377

Hoteleffect

Independent Samples Test

		Levene's Test for Equality of Variances: F	Sig.	t	df	Sig. (2-tailed)
目前市面上，两面针是主流的酒店牙膏品牌之一，如果云南白药牙膏为高端酒店提供定制款牙膏，您认为这将对云南白药牙膏的品牌形象有什么影响？	Equal variances assumed	3.051	.083	2.184	126	.031
	Equal variances not assumed			1.783	25.865	.086

Two Hypothesis:

Ho: Segment 1 = Segment 2

H1: Segment 1 ≠ Segment 2

Results:

5.21 (segment 1) > 4.50 (segment 2)

T (126) = 2.184, p = 0.031

p < 0.05 → reject Ho, and support H1

Conclusions

- People who noticed/used HPT **(segment 1)** believed that **cooperation with high-end hotels improve YB's brand image more, on average** (versus those who did not notice/use HPT, segment 2)
- **Both segments reported means that are higher than 4** (the indifferent point)

Strategy # 7 - Brand Image

Research Q1b - Which Type of Hotels Is Better for Brand Image Improvement?

The bathroom in a Mandarin Oriental Hotel
(Typical Eastern Style)

The bathroom in a W Hotel
(Typical Western Style)

Questions used for analysis

Q: If YB provides toothpaste for **eastern-style** high-end hotels, how will it impact YB in terms of brand image? (interval)

1 —-----2—-----3—-----4----5----6-----—7
Very Negative Indifferent Very Positive

Q: If YB provides toothpaste for **western-style** high-end hotels, how will it impact YB in terms of brand image? (interval)

1 —-----2—-----3—-----4----5----6-----—7
Very Negative Indifferent Very Positive

Two Hypotheses

- Ho = there is **no difference** between the two types of hotels in terms of the impact of hotel cooperation on brand images
- H1 = there is **a significant difference** between the two types of hotels in terms of the impact of hotel cooperation on brand image

Strategy # 7 - Brand Image

Method: Paired-Samples T Test (two dependent means)

Research Q1b - Which Type of Hotels Is Better for Brand Image Improvement?

Means Comparison

5.15 (Eaststyle) > 4.80 (Weststyle)

Two Hypotheses

Ho: Difference = 0

H1: Difference ≠ 0

Results:

T (127) = 2.692, *p* = 0.008 (two-tailed)

***p* < 0.05 → reject Ho, and support H1**

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Eaststyle	5.15	128	1.065	.094
	Weststyle	4.80	128	1.245	.110

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Eaststyle - Weststyle	.352	1.477	.131	.093	.610	2.692	127	.008

Conclusion

- People think that YB **improves its brand image more** by cooperating with **eastern-style hotels rather than western-style hotels**

Strategy # 7 - Brand Image

Method: Linear Regression

Research Q2 - Is Being "Domestic" Crucial to YB's Hotel Cooperation?

Questions used for analysis

Q: If YB provides toothpaste for **eastern-style** high-end hotels, how will it impact YB in terms of brand image? (interval)

1 —-----2-----3-----4----5----6-----7

Very Negative Indifferent Very Positive

Q: To what extent will you associate YB with **"domestic"**? (interval)

1 —-----2-----3-----4----5----6-----7

Not Very Related Not Sure Very Related

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	.339[a]	.115	.108	1.006

a. Predictors: (Constant), 在多大程度上，您会把这些词联系到云南白药牙膏:"国产老字号"

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	3.456	.428		8.076	<.001
	"domestic"	.303	.075	.339	4.043	<.001

a. Dependent Variable: 如果云南白药牙膏为充满东方色彩的高端酒店提供定制产品 (如下图)，在1到7的程度上，您认为这将对云南白药牙膏的品牌形象有什么影响?

Results

Eaststyle (Y) = 3.456 + 0.303 * BranImage_Domestic (X)

($p < 0.001$, R-square = 0.108)

Conclusions

- One unit increase in **brand image closer to "domestic"** can result in 0.303 units of **brand image improvement** caused by cooperation with eastern style high-end hotels
- When YB works with eastern-style high-end hotels to improve brand image, making the brand **more associated with "domestic" is likely to improve the ROI**
- Without having a "domestic" brand image, YB cannot benefit from hotel cooperation (when X = 0, Y = 3.5 < 4)

Strategy # 7 - Brand Image

Research Q3 -Which Type of People Noticed/Used Hotel-Provided Toothpaste More?

Questions used for analysis

Q: If YB provides toothpaste for high-end hotels, how will it impact YB in terms of brand image? (interval)

1 —-----2—-----3—-----4—---5—---6—-----7
Very Negative Indifferent Very Positive

Q: Which type of toothpaste do you choose the most? (nominal, single choice)

a. Treatment
b. Whitening
c. Both
d. No Preferences

Method: Two Proportions Test

Two Hypotheses

Ho: There is **no difference** among people in terms of noticing or using hotel-provided toothpaste (HPT)

H1: There is **a significant difference** among people in terms of noticing or using HPT

Strategy # 7 - Brand Image

Method: Two Proportions Test

Research Q3 -Which Type of People Noticed/Used Hotel-Provided Toothpaste More?

			请问您有注意到或使用过酒店提供的牙膏吗?		
			有	没有	Total
请问您最常购买的牙膏种类是什么?	专业治疗型牙膏，即预防蛀牙/抗敏感/减轻牙龈问题(云南白药，舒适达等)	Count	31	6	37
Toothpaste_Type	Treatment	% within 请问您最常购买的牙膏种类是什么?	83.8%	16.2%	100.0%
		% within 请问您有注意到或使用过酒店提供的牙膏吗?	29.2%	27.3%	28.9%
	专业美白型牙膏(高露洁，黑人等)	Count	21	4	25
	Whitening	% within 请问您最常购买的牙膏种类是什么?	84.0%	16.0%	100.0%
		% within 请问您有注意到或使用过酒店提供的牙膏吗?	19.8%	18.2%	19.5%
	两种牙膏都会购买	Count	33	2	35
	Both	% within 请问您最常购买的牙膏种类是什么?	94.3%	5.7%	100.0%
		% within 请问您有注意到或使用过酒店提供的牙膏吗?	31.1%	9.1%	27.3%
	在购买牙膏时没有明确的倾向性	Count	21	10	31
	No Preferences	% within 请问您最常购买的牙膏种类是什么?	67.7%	32.3%	100.0%
		% within 请问您有注意到或使用过酒店提供的牙膏吗?	19.8%	45.5%	24.2%
Total		Count	106	22	128
		% within 请问您最常购买的牙膏种类是什么?	82.8%	17.2%	100.0%
		% within 请问您有注意到或使用过酒店提供的牙膏吗?	100.0%	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	8.233[a]	3	.041
Likelihood Ratio	8.364	3	.039
Linear-by-Linear Association	1.343	1	.246
N of Valid Cases	128		

a. 1 cells (12.5%) have expected count less than 5. The minimum expected count is 4.30.

Results: $\chi 2\ (1) = 8.233$, $p = 0.041$

$p < 0.05 \rightarrow$ reject Ho, and support H1

Conclusions

- People loving **both types** of toothpaste show the highest proportion (31.1%) of noticing or using HPT

Strategy #7 - Recommendations To Yunnan Baiyao

Findings Obtained from Analysis → **One Unified Strategy**

Finding 1: People who **noticed/used HPT** believed that cooperation with high-end hotels improve brand image **more, on average**

Finding 2: People think that YB can **improve brand image more by cooperating with eastern-style** hotels than western-style hotels

Finding 3: **People loving both types of toothpaste** show the highest proportion **(31.1%)** of noticing or using HPT

Finding 4: People who tend to associate YB with ***"Domestic"*** are **more likely** to perceive YB as a better brand when YB cooperates with **eastern-style hotels**

Cooperate with eastern-style high-end hotels to improve brand image, satisfy diverse preferences, and promote "domestic".

- Except for **in-room disposable** toothpaste, provide hotel guests with **free take-home** (bundled products)
- Enhance **product placement** in hotels
- Provide hotel guests with **both treatment and whitening** OEM toothpaste for selection
- Design the OEM packaging to **be more "domestic" with Chinese elements**

Strategy #7 - Recommendations To Yunnan Baiyao

Free take-home (bundled)

Type 1
Whitening +
Mouthwash

Type 2
Treatment +
Toothbrush

Type 3
Treatment +
Medicine
Product

The more “domestic” packaging

Eastern-Style Hotels to Cooperate With

MANDARIN ORIENTAL
THE HOTEL GROUP

SHANGRI-LA
HOTELS and RESORTS

04 Summary Limitations

Summary

Evaluate Customers Attitude => Increase Market Share & Brand Image

Major Findings	Marketing Concepts		Integrated Strategies
• TXA (ingredient) raise concerns and make less purchase • Unsatisfied with design • Expensive than expected • People cannot fully experience a new toothpaste before they try it. • High-end hotels are effective for YB branding • Celebrity endorsements on e-commerce platforms may be a growth point for YB • YB toothpaste are not at the top in terms of familiarity	Marketing Mix	Product	• Developing tea flavor toothpaste without TXA design “standing form” packaging and make bundling selling, corporate with celebrity and use their picture in e-commerce platform • Having disposable toothpaste vending machines at shopping mall • Cooperate with eastern-style high-end hotels • Co-branding with The palace museum
		Price	
		Promotion	
		Place	
	Branding	Co-Branding	
		Brand Image	

Limitations

#1 Flaws in Self-Reported Responses

- **Cognitive bias:** self-reports are often more positive than assessments from strangers, but people tend to view themselves more negatively than others do
- **Interpretation of questions:** the wording of the questions may be confusing or have different meanings to different subjects
- **Rating scales**: interval scales can be inexact and subject to individual inclination to give an extreme or middle response to all questions

#2 Issues with R-square, sampling, and sample size

- **Weak R-Squared**: the R-squared in our models are around **0.01-0.108**, which implies that our independent variables only explains **1%-11%** of the variations in dependent variable. Therefore, it is **not suggested to use our models for the purpose of precise forecasting**
- **Convenient Sampling:** we used convenient sampling that may make our results less representative
- **Sample Size:** we have a relatively small sample size, which makes it difficult for us to have better results

Sources:
[1] Kim, H., Di Domenico, S. I., & Connelly, B. S. (2019). Self–Other Agreement in Personality Reports: A Meta-Analytic Comparison of Self- and Informant-Report Means. Psychological Science, 30(1), 129–138. https://doi.org/10.1177/0956797618810000
[2] Boothby, E. J., Cooney, G., Sandstrom, G. M., & Clark, M. S. (2018). The Liking Gap in Conversations: Do People Like Us More Than We Think? Psychological Science, 29(11), 1742–1756. https://doi.org/10.1177/0956797618783714
[3] Salters, K. (2022). Can Psychological Self-Report Information Be Trusted?. Verywell Mind. Retrieved 29 April 2022, from https://www.verywellmind.com/definition-of-self-report-425267.

Thanks
Q&A