

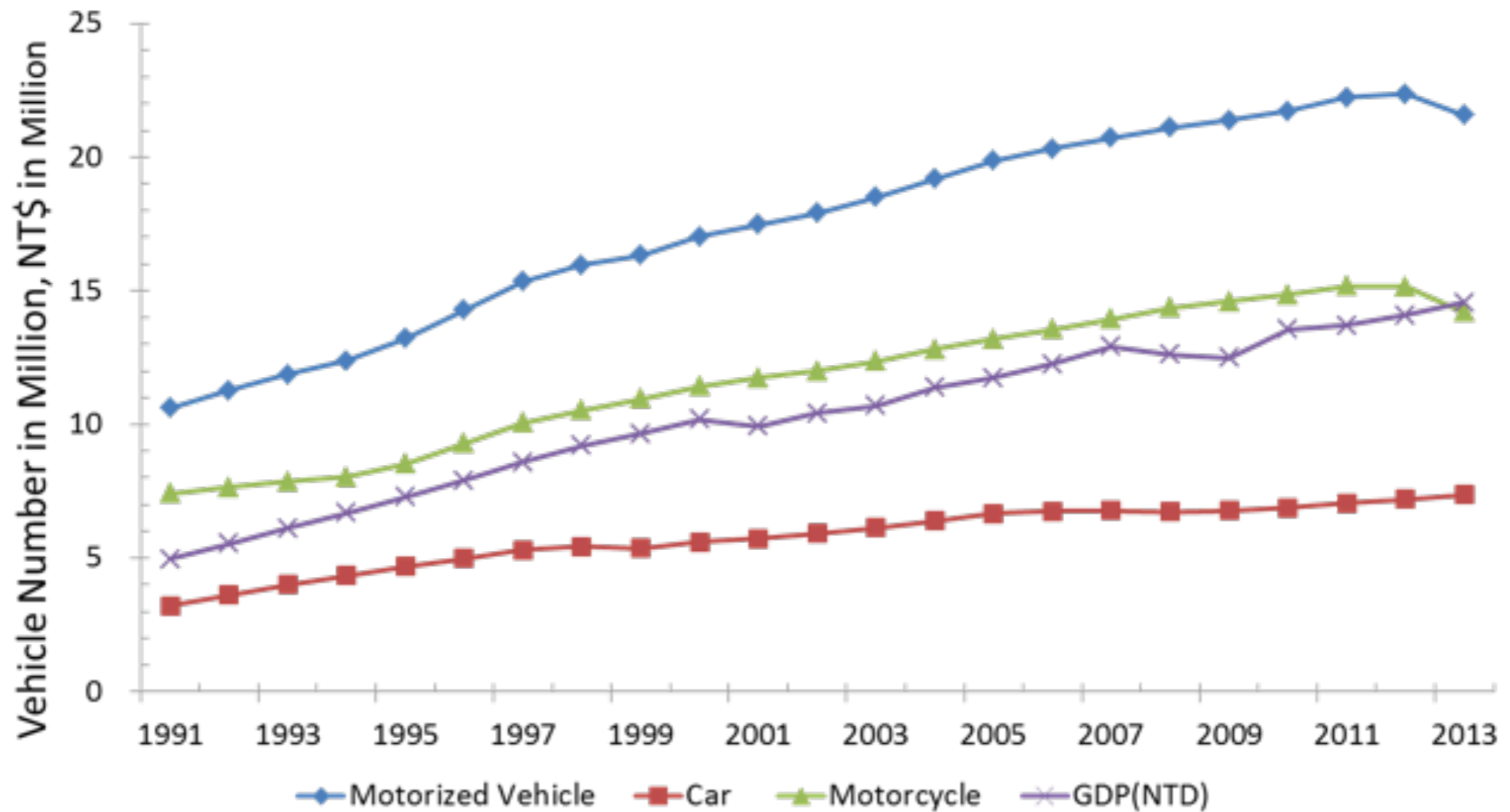
The Power of Knowledge

A Study of Behavior Change and Willingness to Pay for Bike Sharing System

Jenny Chen
S.K. Jason Chang





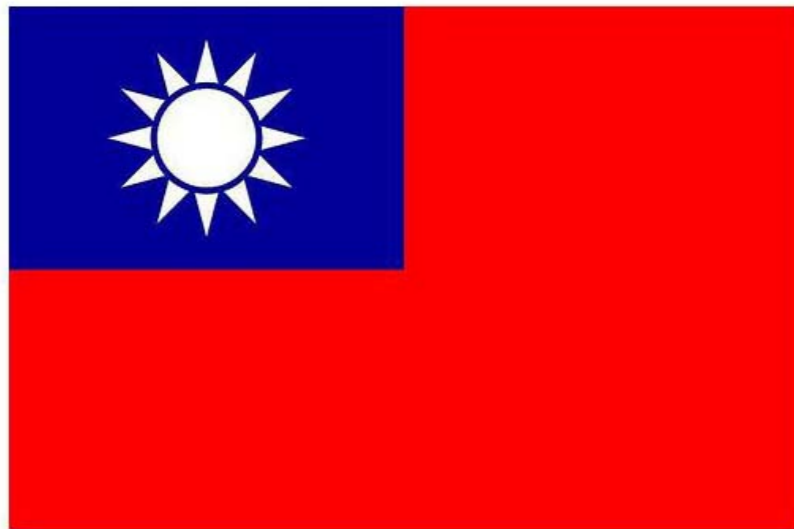


The development shows that as the economic level increases, the motorized vehicle number increases as well for the past decades.

MOTORCYCLE OWNERSHIP

Motorcycles per Thousand People, 2012

TAIWAN



649.2

VIETNAM



412.5

THAILAND



304.2

Why Motorcycles?

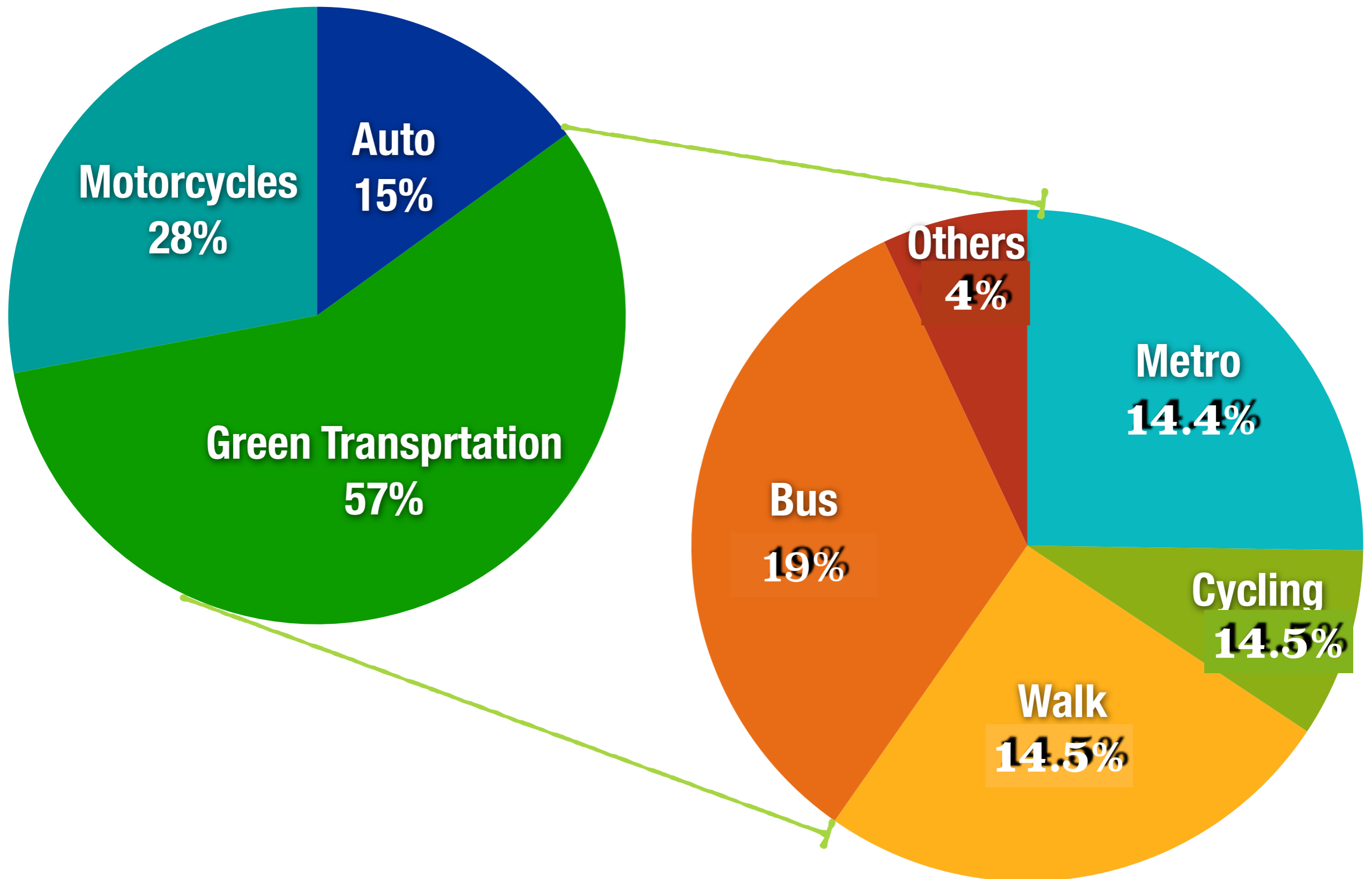


**Free parking (or
\$0.7 per day)
MC: 1/6 space
of car**

**O&M Cost
(\$/km):
MC 0.09
Car 0.38**

**Mixed land use
Commuting
time: 10-20 min**

Mode Share of Taipei City, 2013



> Basic rate	Without BahnCard	With BahnCard	Students
per Minute	0.08 Euro	0.08 Euro	0.08 Euro
max. per day (24 h)	15.00 Euro	9.00 Euro	9.00 Euro

> **Flat rate**

annual fee	48.00 Euro	36.00 Euro	24.00 Euro
1st – 30th minute	free	free	free
as from 31st minute	0.08 Euro	0.08 Euro	0.08 Euro
max. per day (24 h)	15.00 Euro	9.00 Euro	9.00 Euro

In Stuttgart, the first 30 minutes are free for all customers.

Call a Bike customers can also use StadtRAD Hamburg bikes and Konrad Kassel bikes without having to register again.

San Francisco, CA



MEMBERSHIP FEES

24 HOUR	3 DAY	1 YEAR
\$9	\$22	\$88

Membership includes unlimited trips up to 30 minutes each at no additional cost.



OVERTIME FEES

+ \$0	UP TO 30 MINUTES
+ \$4	30 - 60 MINUTE TRIP
+ \$7	EACH ADDITIONAL 30 MINUTES

Overtime fees will apply to trips longer than 30 minutes.

San Francisco, CA



MEMBERSHIP FEES			+		OVERTIME FEES	
24 HOUR	3 DAY	1 YEAR			+ \$0	UP TO 30 MINUTES
\$9	\$22	\$88			+ \$4	30 - 60 MINUTE TRIP
Membership includes unlimited trips up to 30 minutes each at no additional cost.					+ \$7	EACH ADDITIONAL 30 MINUTES
					Overtime fees will apply to trips longer than 30 minutes.	

The ultimate goal is to enhance the perceived value for all means of public transportation in Taipei.

Travel Demand Management



“Hard” measures

Changes in infrastructure that are “forced upon” travelers

road closures, car-free zones, bike lanes, and usually less coercive pricing measures.



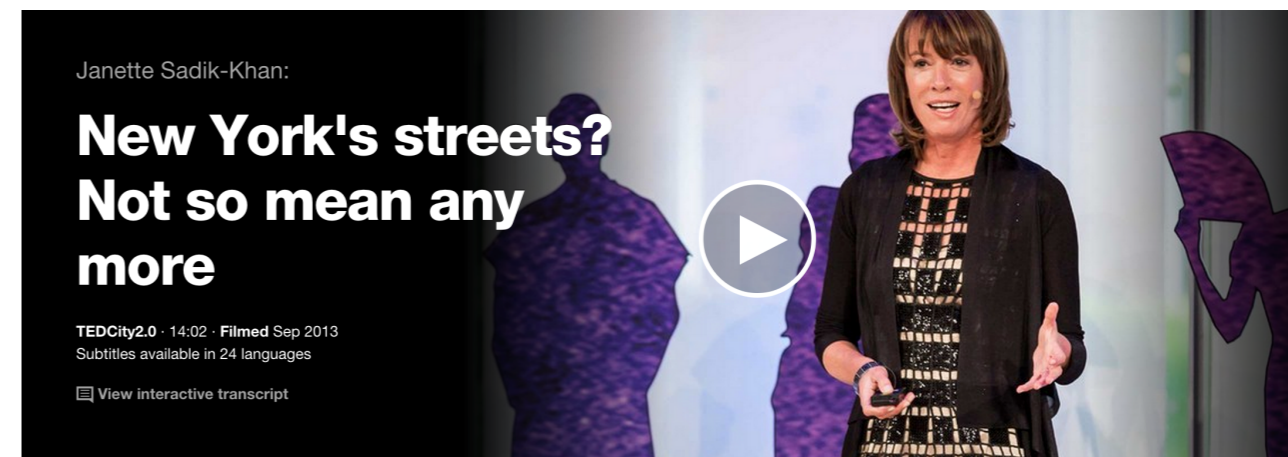
“Drawing on insights from modern behavioral and social sciences can generate new kinds of interventions that can be highly cost effective.”

Information Provision

Information & Willingness to Pay



Information and Education Measures & Sustainable Travel Behavior



The aim to provide incentives and information are to change behavior by **changing minds.**

1. Pricing structure: Paris

在 2013 年，巴黎已經成為市場滲透率最高的公共自行車城市，平均每 97 個人有一台車。除此之外，巴黎Vélib'獲得使用者正面評價。

依據調查分析結果：

- 96%的人認為 Vélib' 帶給巴黎一個非常正面的形象
- 94%的人認為 Vélib' 讓巴黎更為美好
- 89%的人表示 Vélib' 讓巴黎行動更方便



Pricing Structures from other cities

2. Pricing structure: Hangzhou

杭州公共自行車已經成為杭州中外遊客和市民出行必不可少的城市交通工具，目前杭州自行車旅次佔了整體運輸系統旅次的**43**百分比，其中都**歸功於公共自行車**。統計資料顯示，大約有**30**百分比的會員已經將公共自行車納入他們的**通勤**。

除此之外，杭州公共自行車也被英國廣播公司（BBC）旅遊頻道評為"全球8個提供最棒的公共自行車服務的城市之一"，並被國外專家和媒體譽為「世界最大公共自行車」項目的起源地。

Traditional

3. Health Benefits

According to a study from Department of Transport, **regular cyclists on average live two years longer than non-cyclists and take 15% fewer days off work through illness**... Other research also points out cycling 15 minutes a day for 5 days a week will burn 4.99 kilos of fat over the course of a year..

4. Public Subsidies

Do you know the funding used to finance free rides for YouBike users who can enjoy free use of the bikes for trips that last 30 minutes or less is **provided from the EPA fund of air pollution, participation fund and also from the taxpayers?....**

What tool I used?

Randomized Distribution Experiment Design

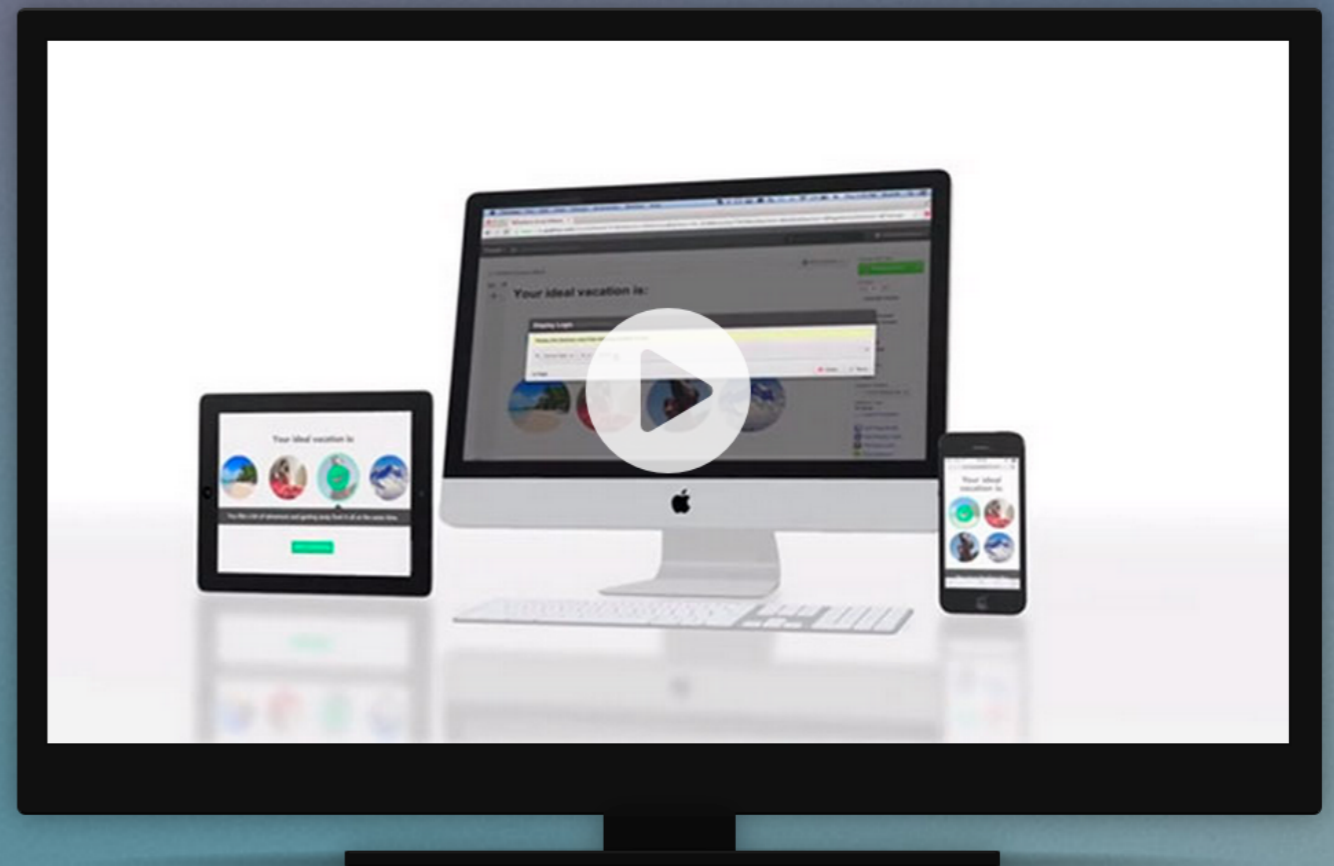
Academic Insights

Qualtrics Research Suite

Sophisticated Online Surveys
Made Simple.

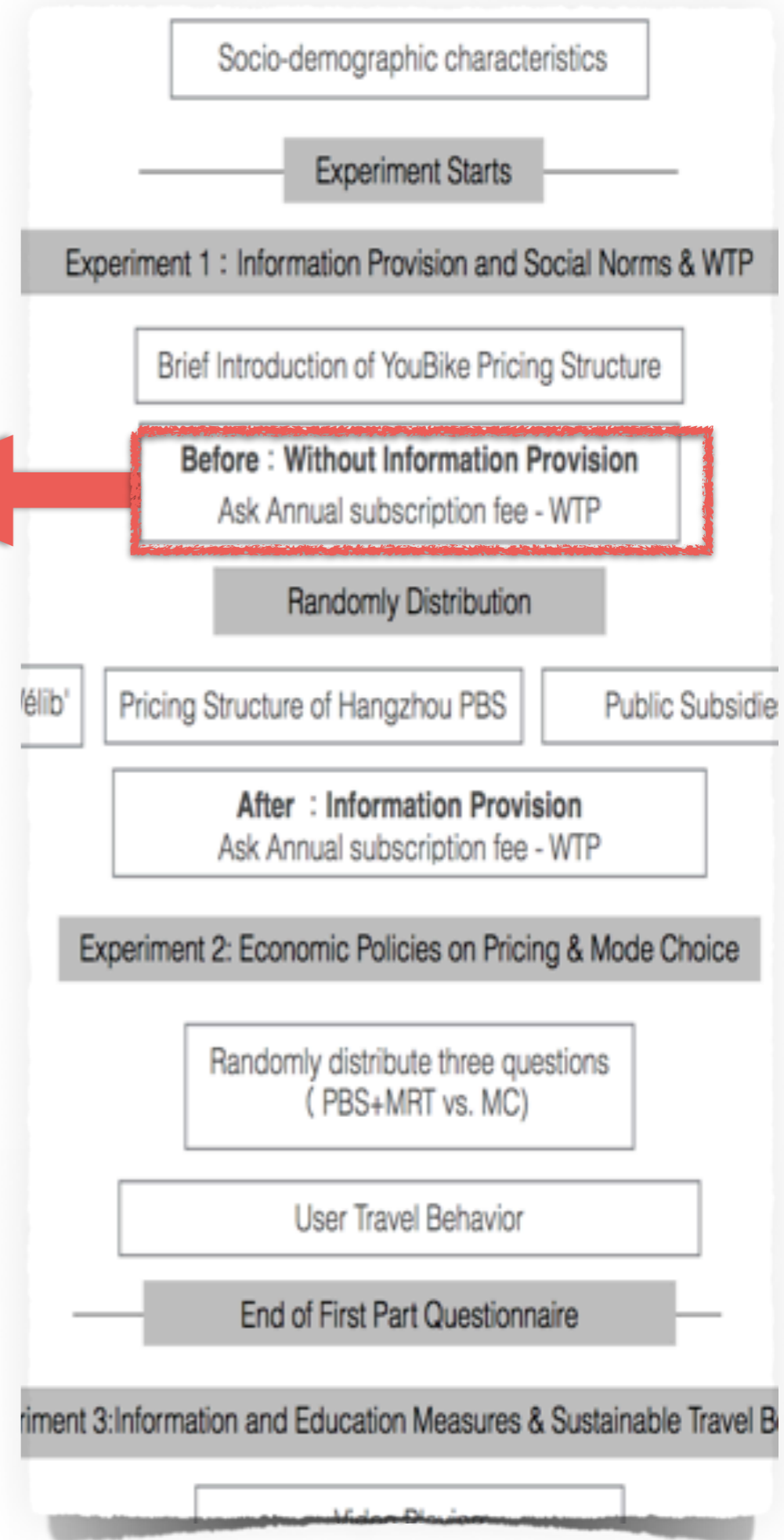
[Request Demo](#)

[Request Pricing](#)



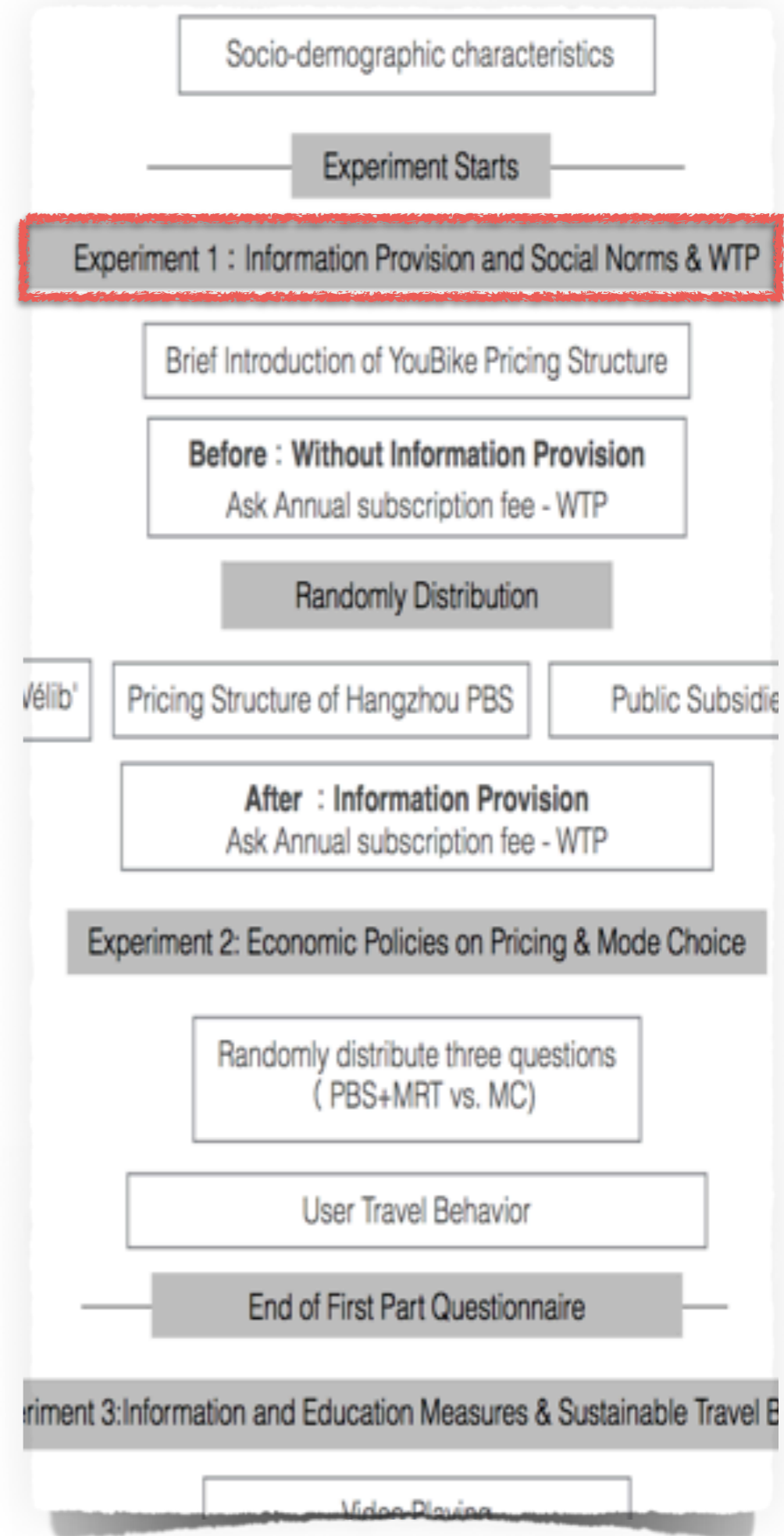
Pricing Structure Setting

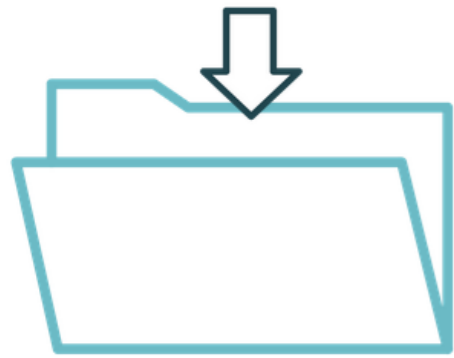
	Subscription Fee				
Age under 26	\$NTD 249	\$NTD 499	\$NTD 749	\$NTD 999	\$NTD 1199
Age above 26	\$NTD 499	\$NTD 749	\$NTD 999	\$NTD 1249	\$NTD 1499



Experiment Results

Provision of Information
and Social Influences & WTP





Collect



Analyze



Act

Socio-demographic Characteristics of Sample

May, 2015

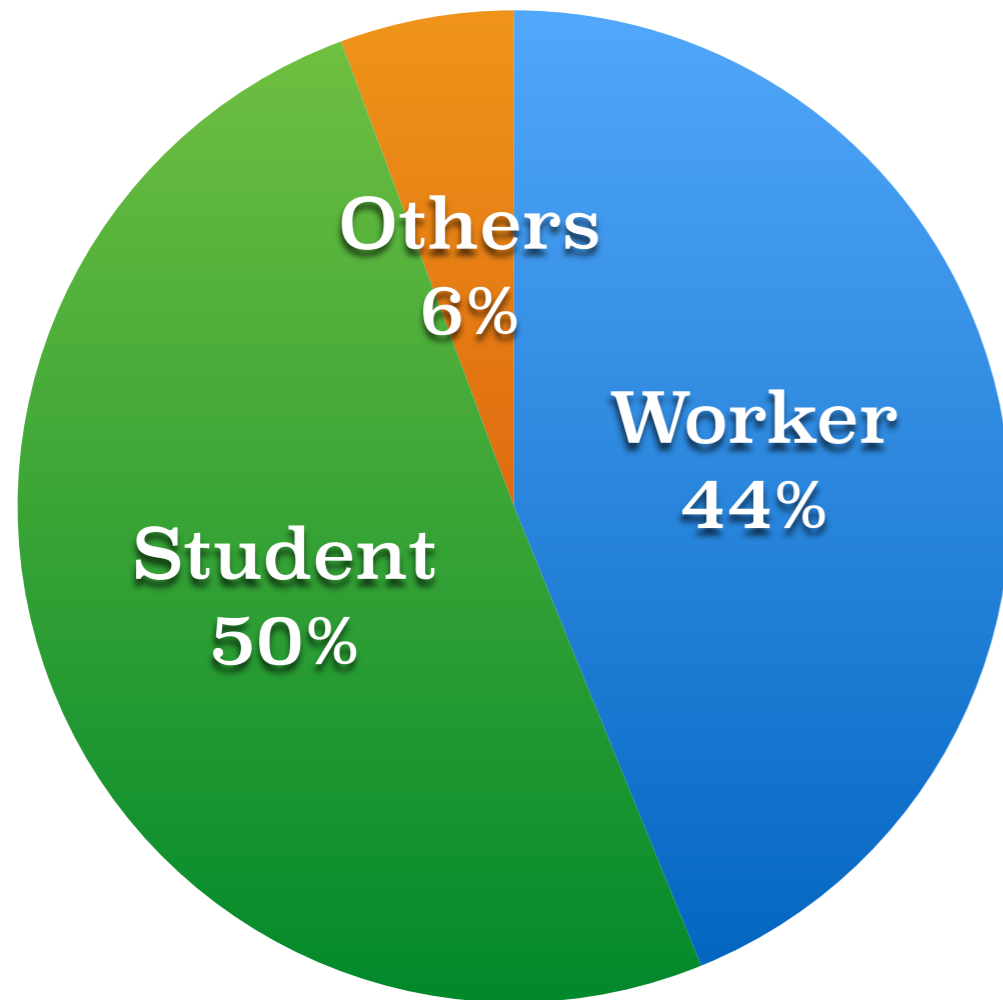
406 Respondents

Median 25 Years Old (58% under 26)

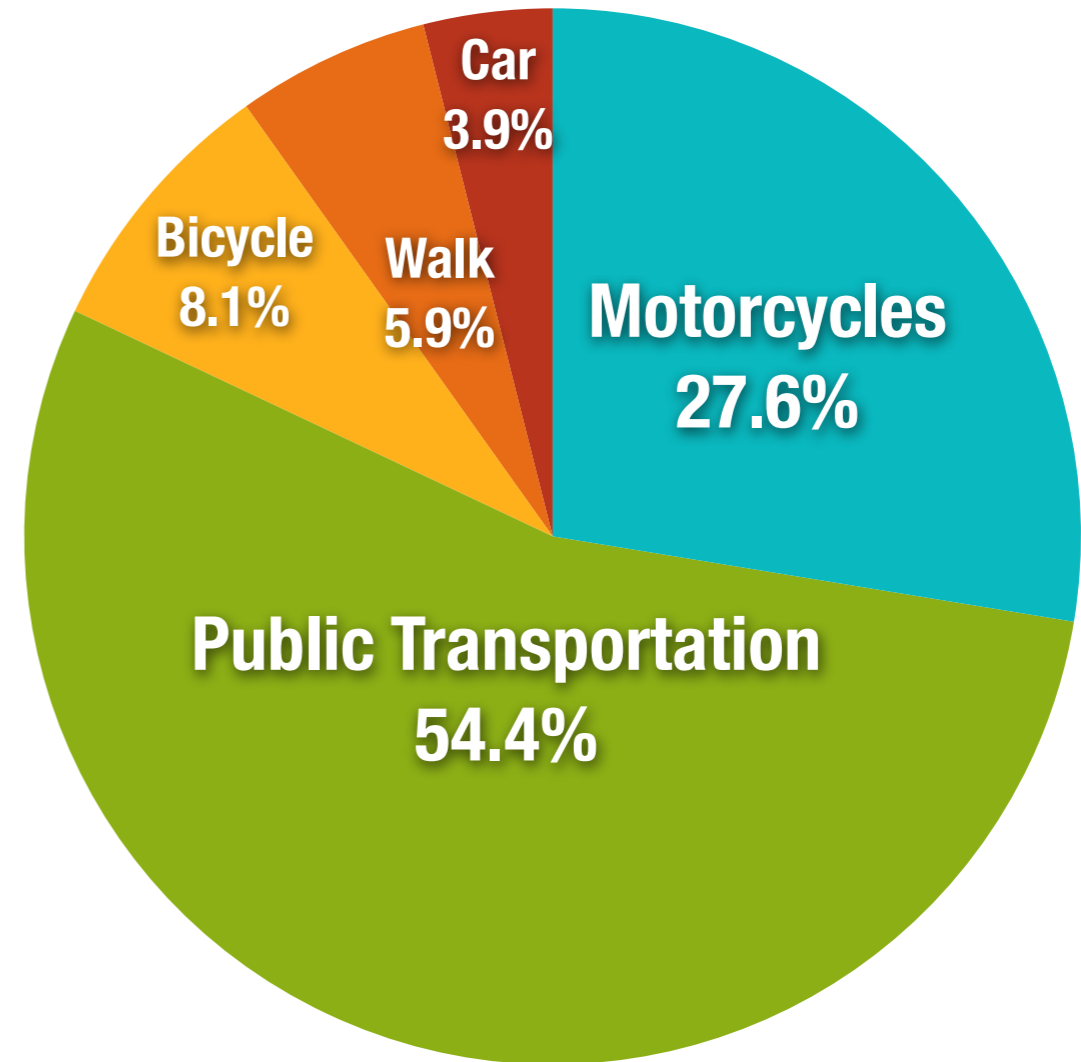
54% of Female

Fulfill all Experiments : 72%

Socio-Professional Category



Commuting Mode



YouBike Use Purpose:
Commuting: 22.2 % ;
Neither Commuting nor Leisure : 48.3%

YouBike Regular User: 21.7%; Never Use: 14.2%

1. Pricing structure: Paris

99

法國巴黎公共自行車—Vélib'使用費率

會員類別	長期會員		青年方案			短期會員	
	Vélib' Classic	Vélib' Passion	14~26 歲	14~26 歲 學術研究學者	16~25 歲 待業、職訓 市民	一日票	七日票
會員有效期	1年	1年	1年	1年	1年	1日	7日
會員費	€29 (約新台幣 \$1011)	€39 (約新台幣 \$1360)	€29 (約新台幣 \$1011)	€19 (約新台幣 \$662)	€19 (約新台幣 \$662)	€1.7 (約新台幣 \$59)	€8 (約新台幣 \$279)
免費騎乘時間	30分鐘	45分鐘	45分鐘	45分鐘	45分鐘	30分鐘	30分鐘
延長使用費率	免費騎乘時間過後，延長使用： 第1個30分鐘€1；第2個30分鐘€2；之後每30分鐘€4						
押金	€150 (約新台幣\$5106) (以銀行帳戶、支票或信用卡預授權)						

2. Pricing structure: Hangzhou

100

杭州公共自行車

騎乘時間	收費標準
押金 (包括保證金及租車費用)	人民幣200元 (約新台幣981元)
一小時以內	免費
一小時以上至兩小時	人民幣1元
兩小時以上至三小時	人民幣2元
三小時以上	每小時3元人民幣

3. Health Benefits

100

據相關研究指出，固定騎腳踏車的人可多**2年壽命**，罹患心臟疾病機率是一般人的一半，身材外型更比同年齡的人年輕**10歲**，對城市和個人都很「健康」。
更有研究指出....

4. Public Subsidies

105

政府補助是人民納稅錢

您知道台北市公共自行車YouBike前30分鐘免費補助款是來自於環保署空污基金、促參基金和市府編列預算等人民納稅錢嗎？北市府發言人林鶴明表示，YouBike前30分鐘免費其實不算真的免費，仍...

Descriptive Statistics Findings

- **Crowding effects :**

Age under 26 > Age above 26 ;

Female > Male

User > Non-user

- **Most significant Information for under age 26:**

Fare-Paris > Fare- Hangzhou > Public Subsidies > Health Benefits

- **WTP Differences:**

Hangzhou (under age 26) > Paris (above age 26) > Paris (under age 26) > Public Subsidies (under age 26) > Health Benefits



Hypothesis:

Providing information on social norms and public subsidies has a greater influence on WTP differences than traditional information health benefits

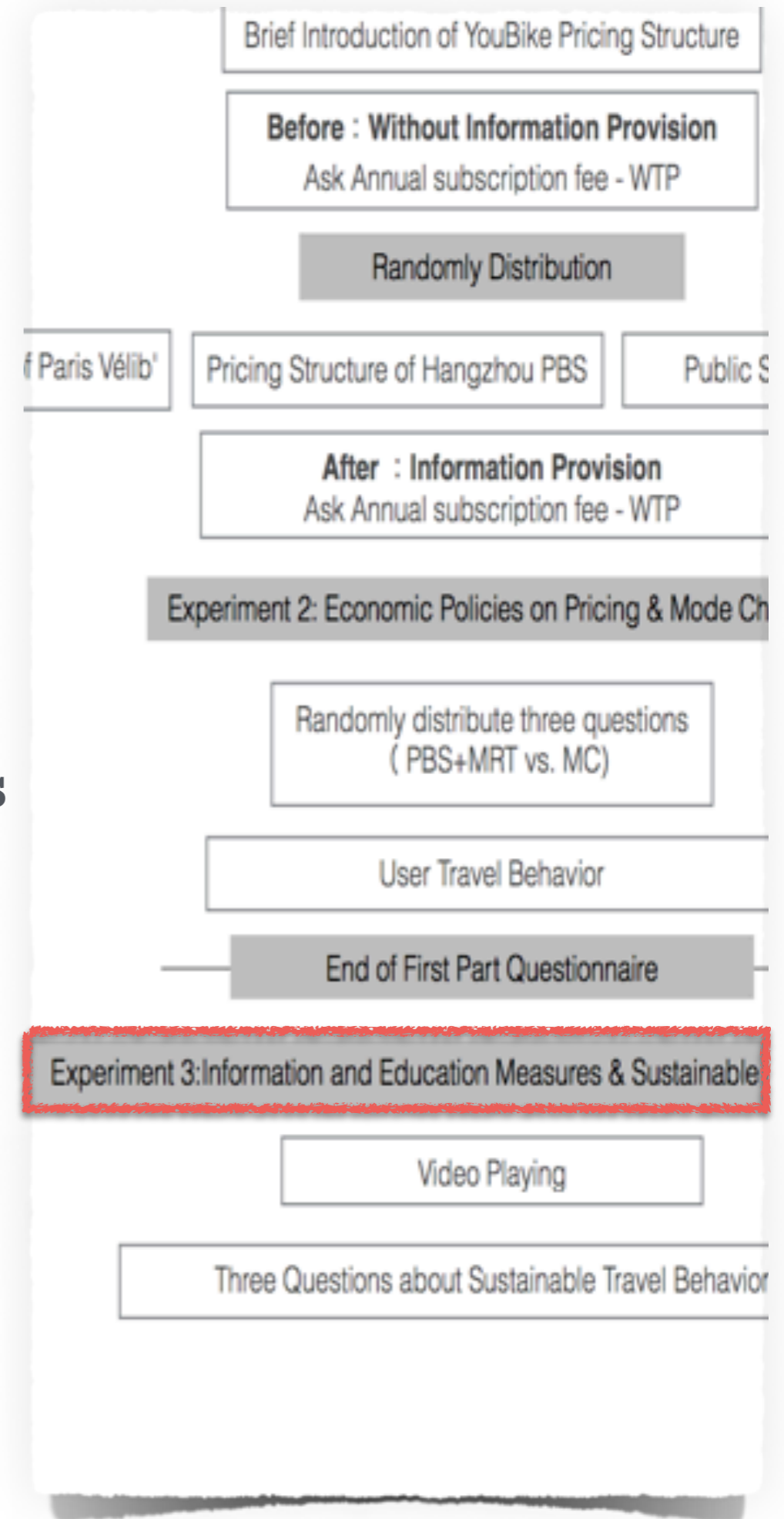


Findings:

*Social norms and public subsidies do, indeed, **have the most significant impact on crowding effects** than traditional measure.*

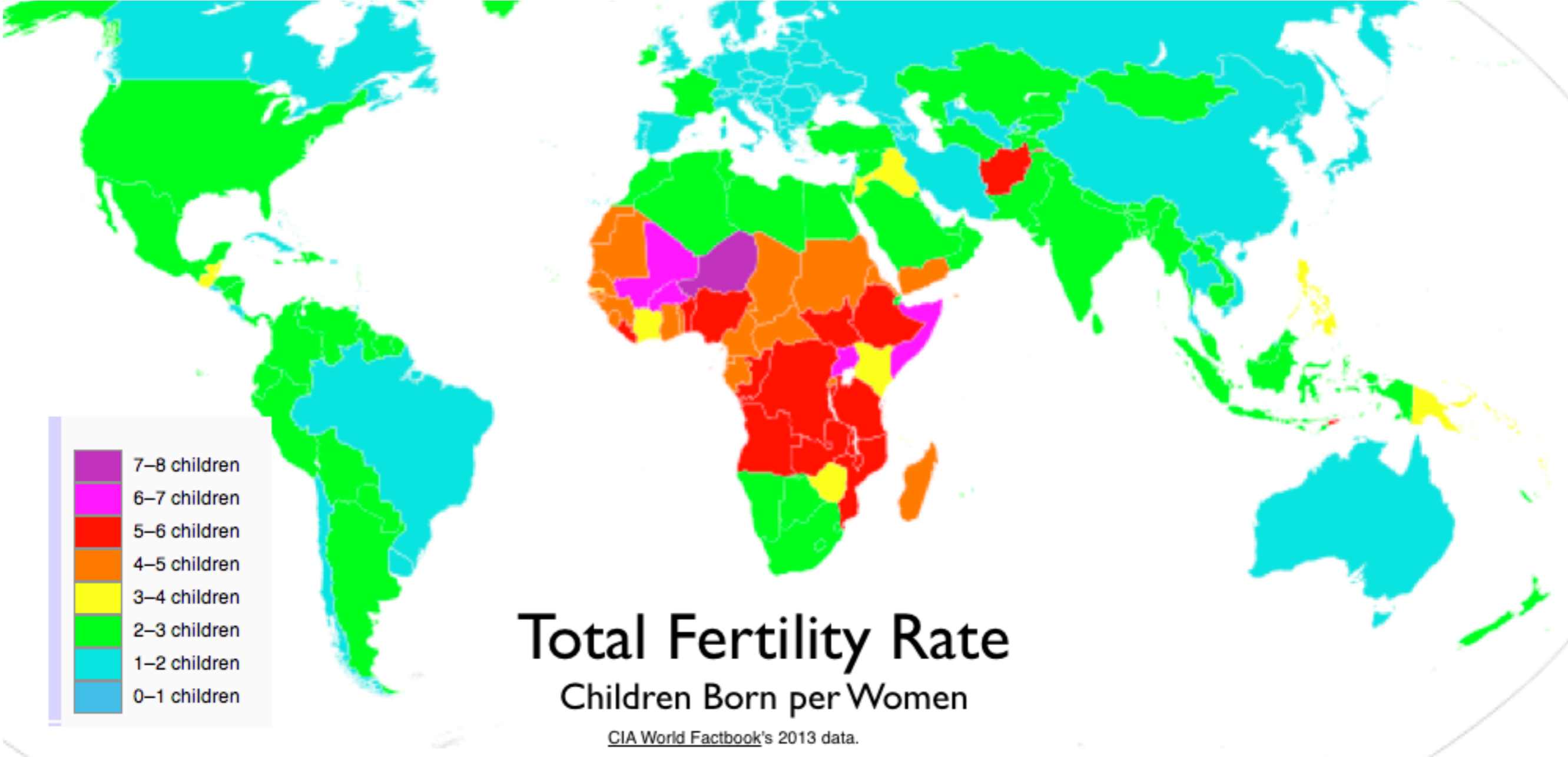
Experiment Results

Information and Education Measures
& Sustainable Travel Behavior



Media Provision-Soup Operas

In Brazil, birthrates have dropped from from 6.25 to 1.81 in the past 50 years. Media helps alter certain cultural norms that, in turn, lead to women choosing to have fewer kids.



La Ferrara, E., Chong, A., & Duryea, S. (2012). Soap operas and fertility: Evidence from Brazil. *American Economic Journal: Applied Economics*, 1-31.

6 Minutes Video

Janette Sadik-Khan:

New York's streets? Not so mean any more

TEDCity2.0 · 14:02 · Filmed Sep 2013

Subtitles available in 24 languages

[View interactive transcript](#)



- Do you agree with it?
- **Now think about your travel behavior, how often do you expect to use Active Mobility in the coming week?**

Do You Agree with the Idea from this Video?

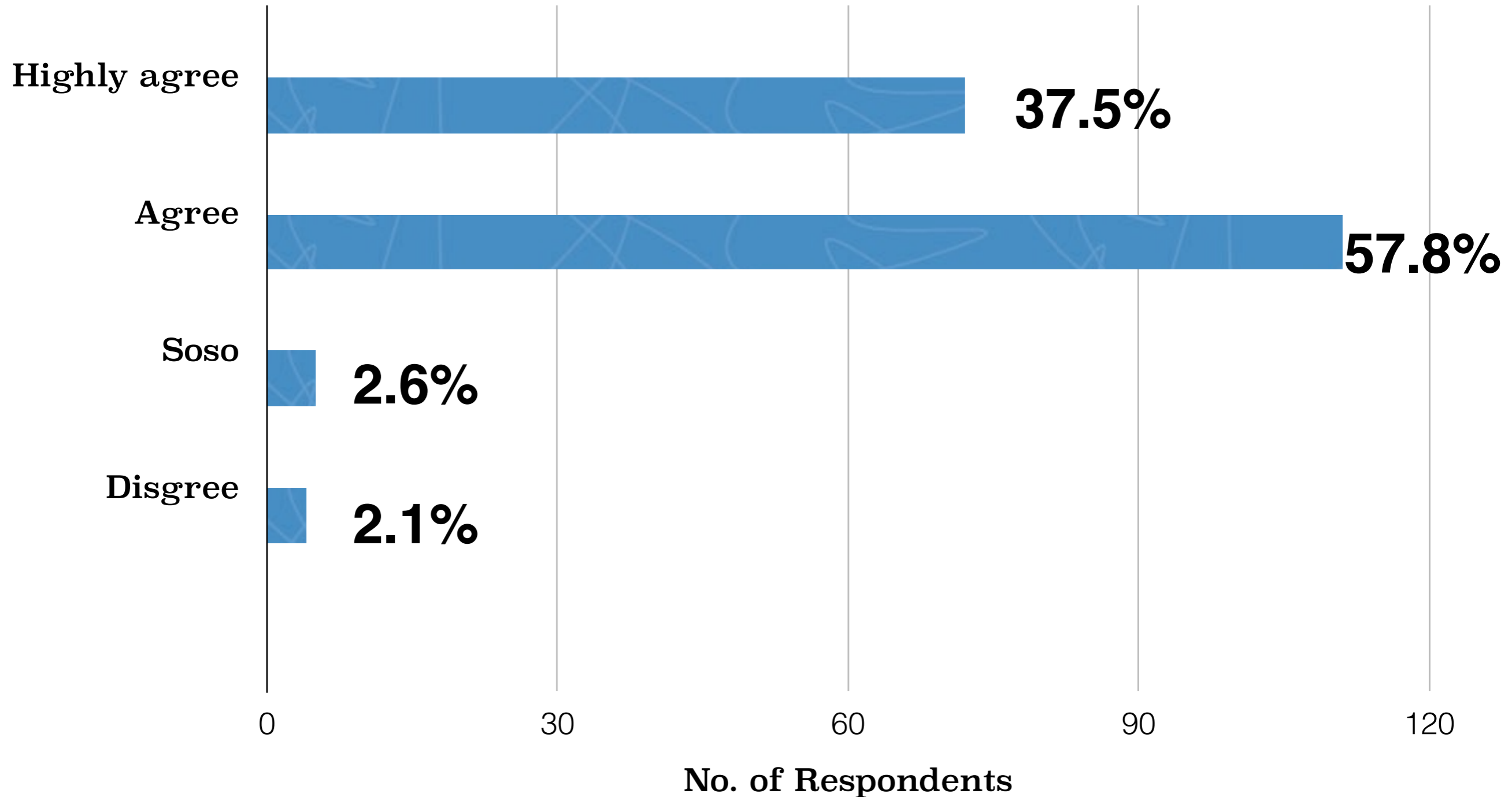


Table 4.15. Estimation Results from Experiment 3

Explanatory variables -- applicable alternatives	More Frequent	No change	Estimate	t-test	p-value
Constant -- more frequent	x		3.893	2.993	0.0028
Right answer to the problem-dummy	x		0.688	1.89	0.0585
Video did impact on letting them rethink about where they want to live - Soso	x		2.19	2.04	0.0413**
PBS usage as leisure purpose-dummy	x		-0.806	-1.65	0.0977
Income level for above 60,000 –dummy	x		-0.935	-1.94	0.0529
After willingness to pay for PBS (\$NTD)	x		-0.001	-2.19	0.0283**
New Taipei citizens-dummy		x	-0.631	-1.59	0.1109
Video did impact on letting them rethink about where they want to live - Positive		x	2.66	2.45	0.0144**
Income level for range from 30,000 to 59,999 (\$NTD/month)		x	-1.39	-2.53	0.0115**
Socio-professional category-worker		x	1.22	1.73	0.0831
Socio-professional category-student		x	0.687	1.12	0.2625
Number of observations	376				

Significant Finding Estimation

Higher Accuracy, Higher Behavior Modification

Higher Income, Lower Behavior Modification

Worker less likely to change their Behavior than Student



Open-ended Questions

- **72 %** of respondents were willing to write their idea about how they feel about their city
- Playing video from a credible speaker and a good example from a well-known city may have influence on peoples thinking to the high extent.



Conclusions

- Provision of ***pricing structures*** information can change ***perceived value (WTP)*** and behavior for Bike Sharing System.
- Provision of ***Media*** can affect people's mental model toward more sustainable behavior.
- In addition to implement economic policies on pricing to force individual's traveler behavior , provision of information and social norms may also be used to nudge traveler behavior.

Suggestions

- Providing video by powerful messenger of sustainable city may be applied to change people's mindset over the long-term
- Combination of three experiments could generate new kinds of highly cost effective interventions for transportation practitioner.



Thank you!

