An analysis of inbound tourist behavior after the Great East Japan Earthquake

Institution for Transport Policy Studies

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Outline

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- Research question
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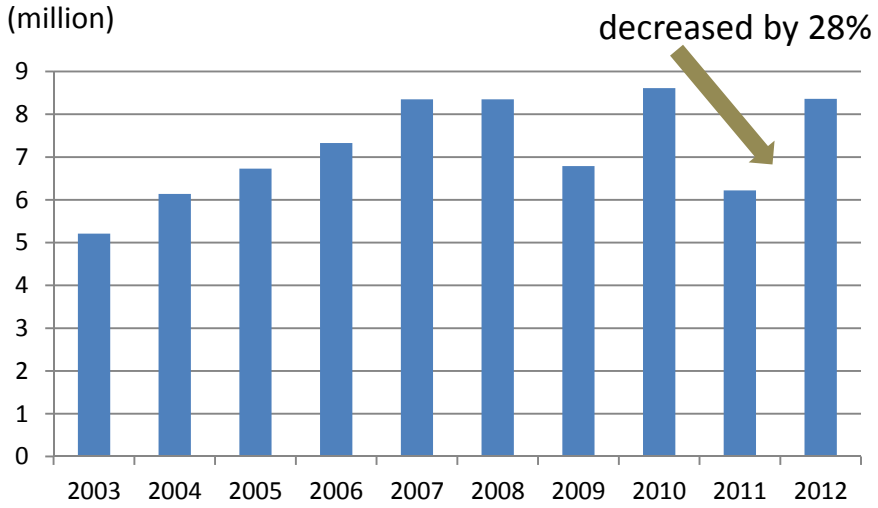
Background

The tourism industry is inherently vulnerable to interruption by risk and disasters.
e.g., 911 terrorism attack (2001)
SARS (2003)
Indian Ocean tsunami (2004)
Christchurch (New Zealand) earthquakes (2011)

So far, a large number of studies have been conducted concerning risk management in tourism research field. However, most of the existing studies focus on the supply side. Limited effort has been made for an understanding of tourists' behavior under risk and its implication for the tourism industry.

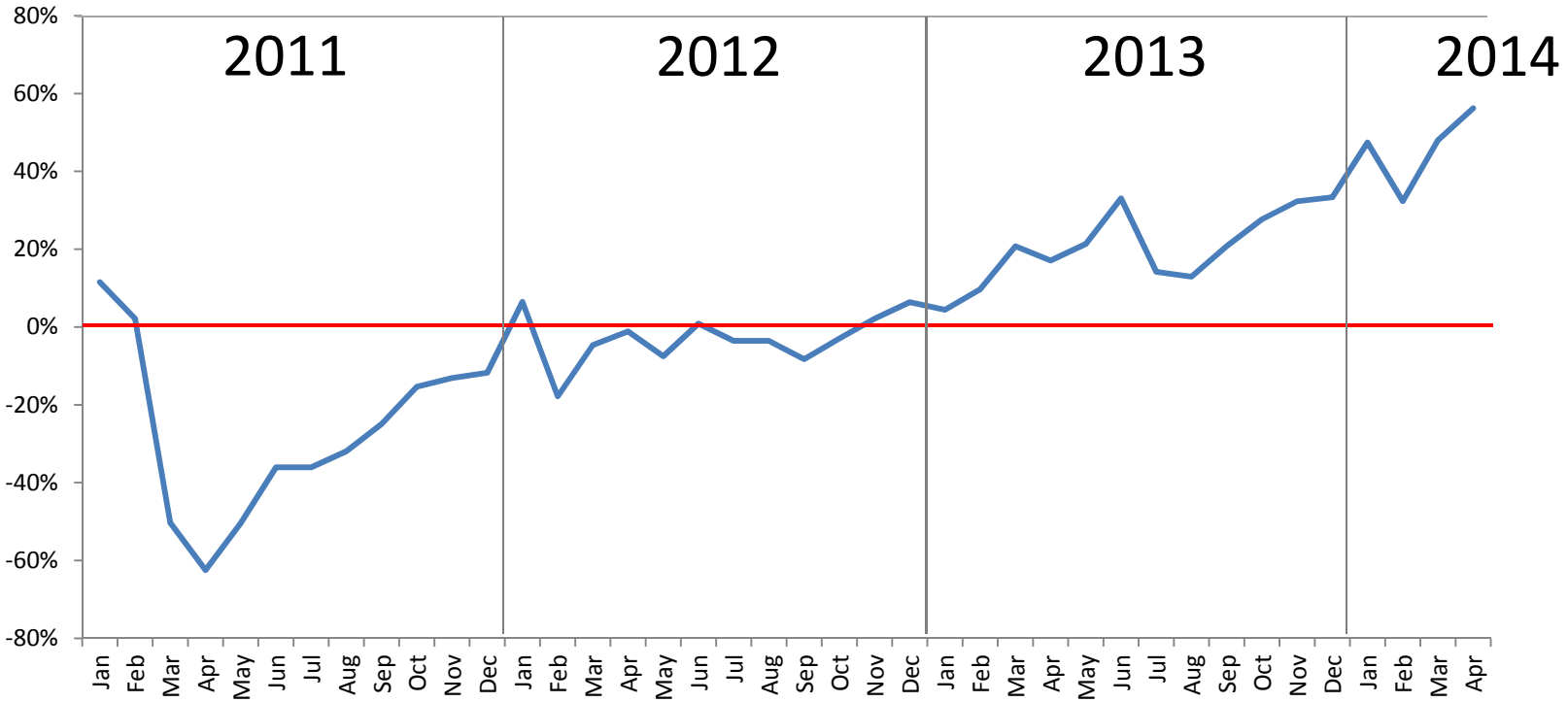
Background

On March 11th 2011, an earthquake happened in the Tohoku area of Japan. The disaster saw a sharp decrease in the number of international tourist arrivals in Japan.



Background

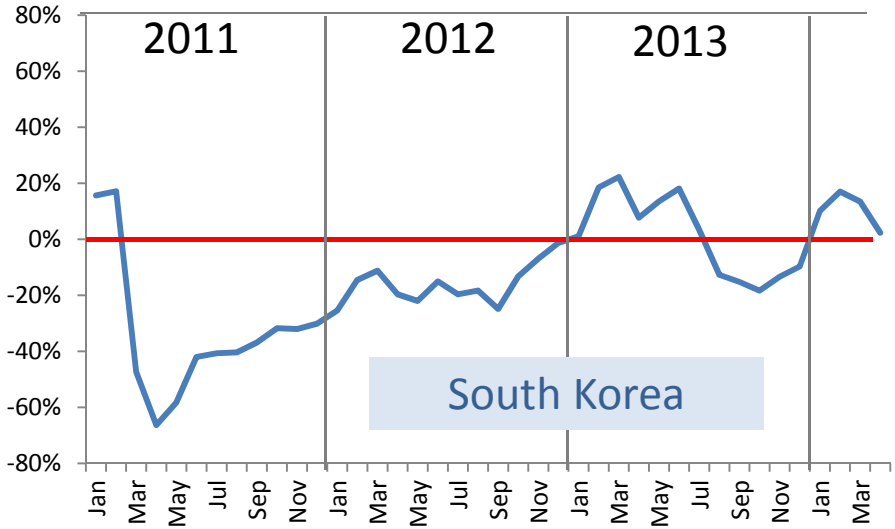
In order to attract tourists back, the Japanese government has implemented a series of countermeasures to revitalize the tourism industry. From the end of 2012, inbound tourism demand has recovered to the level before the earthquake.



Change rate by comparing with inbound tourism demand in 2010

Background

However, the recovery process of different markets showed different patterns and the travel intention to Japan still remains low among some segmentation of international tourists.



To address these issues and provide the tourism industry in Japan with critical insights for their tourism recovery and resilience decision-making, it is necessary to get a better understanding of international tourists' behavior response to the earthquake.

Research question

In this study, we are especially focusing on the following questions:

(1) What are the key reasons international tourists would / would not travel to Japan following the earthquake?

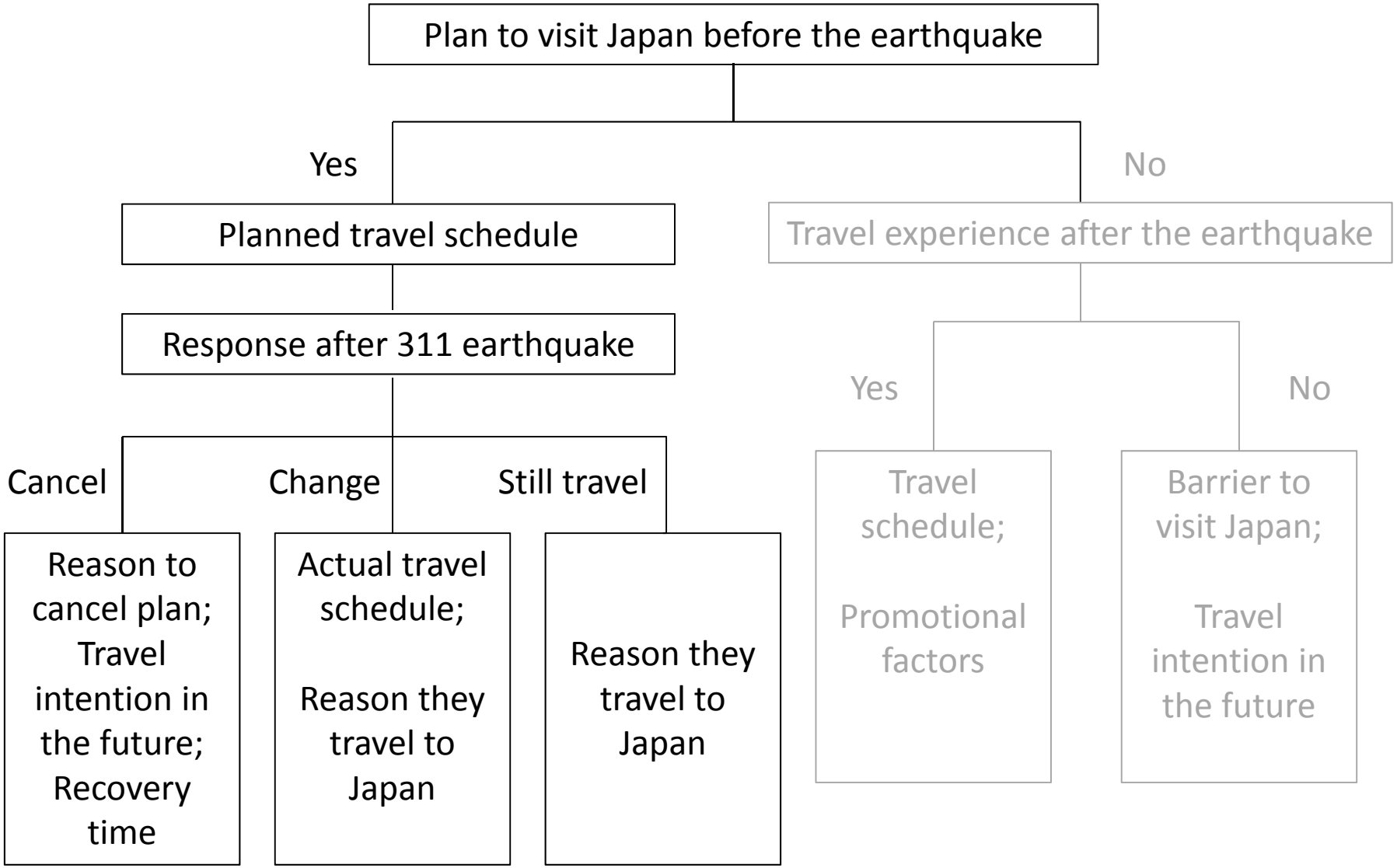
(2) Are these reasons different across tourists with different demographic factors (age, gender, income, etc)?

(3) How did international tourists response to the earthquake? How did demographic background, past travel experience, trip purpose, and image perception influence their behavior response?

Survey

Implementer	Institution for Transport Policy Studies
Time period of the survey	January, 2014
Survey area	South Korea, China (Beijing, Shanghai)
Target respondent	Residents in the target areas
Survey method	Web survey
Sample size	South Korea : 500 respondents Beijing : 500 respondents Shanghai : 500 respondents
Survey content	**Individual characteristics** Gender, age, education level, annual income, travel experience to Japan **Behavior response to 311 earthquake**

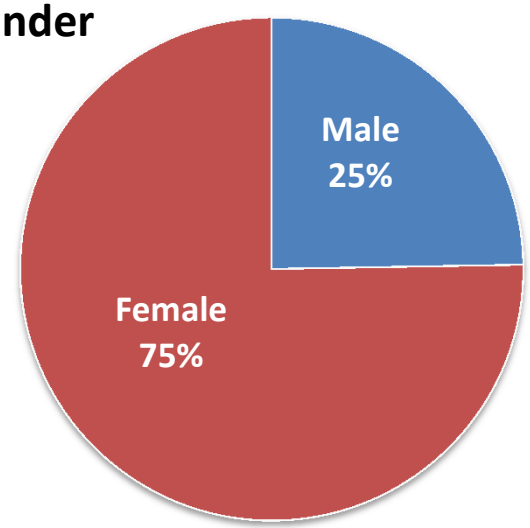
Survey content



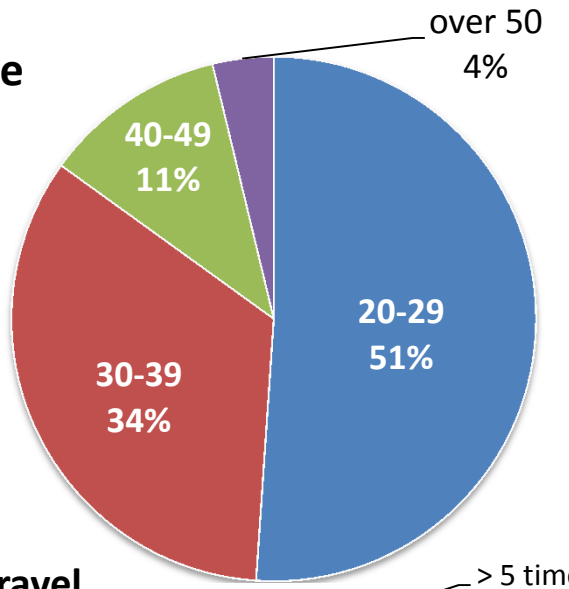
Data (South Korea)

Individual characteristic

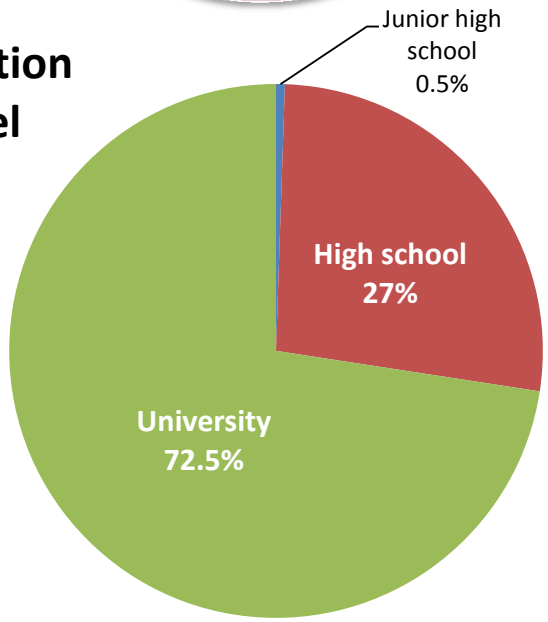
Gender



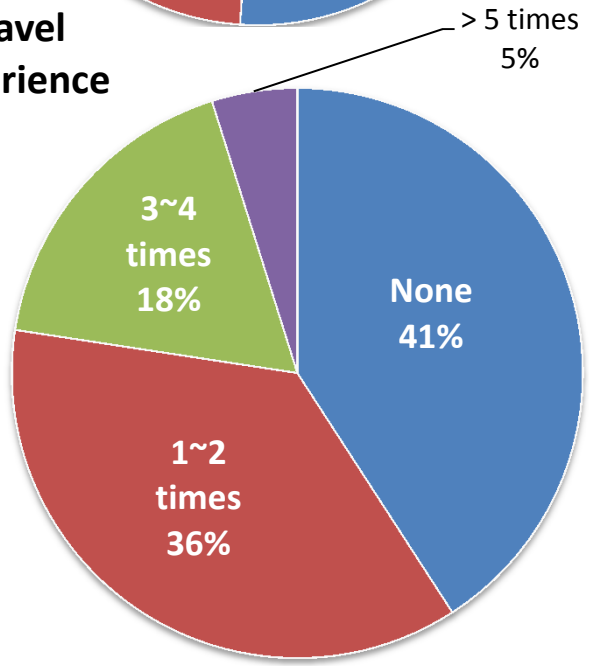
Age



Education level



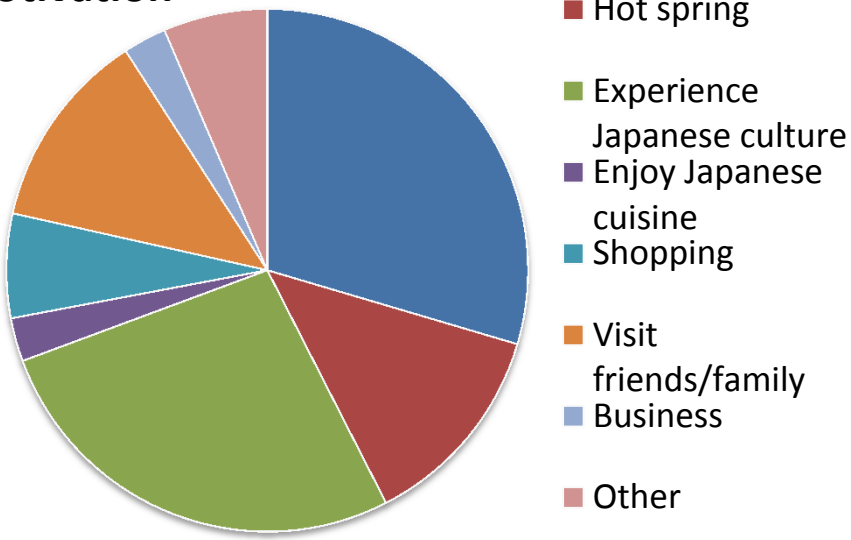
Travel experience



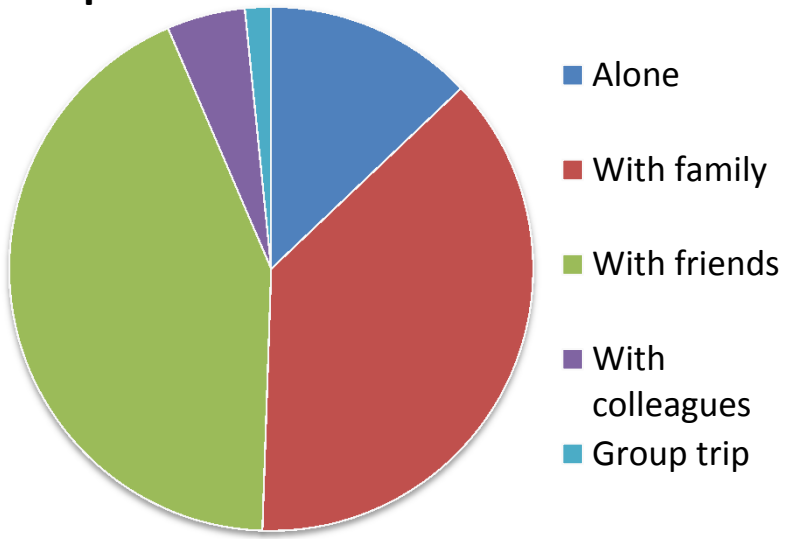
Data (South Korea)

Planned travel schedule

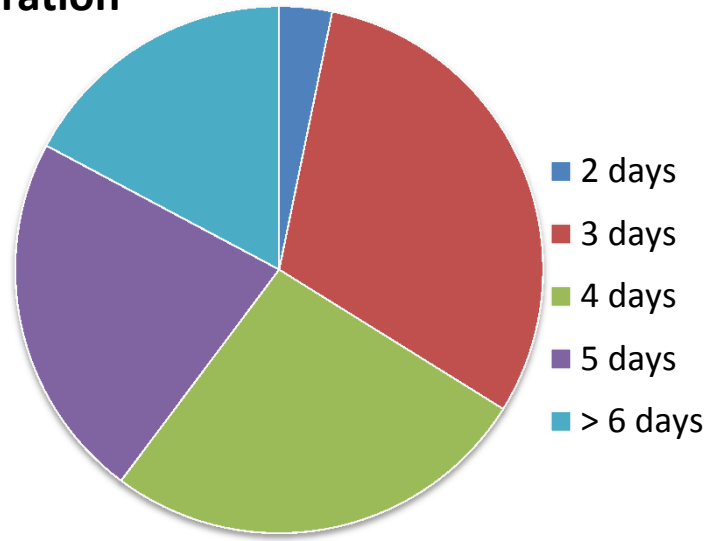
Motivation



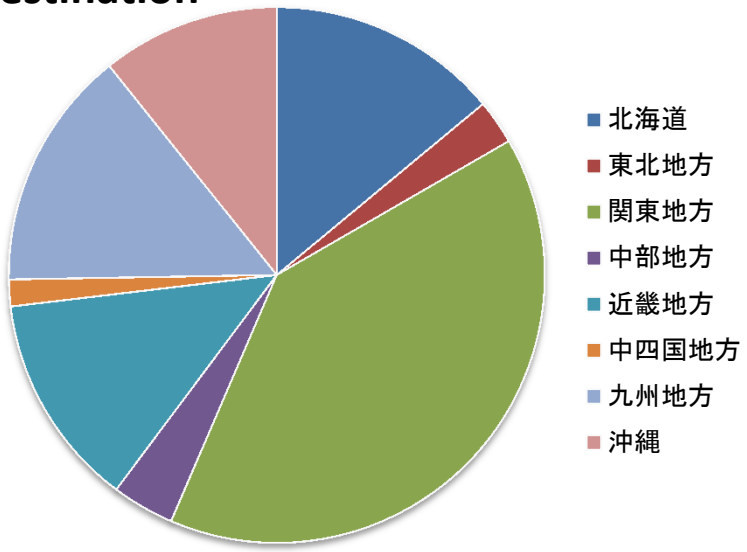
Companion



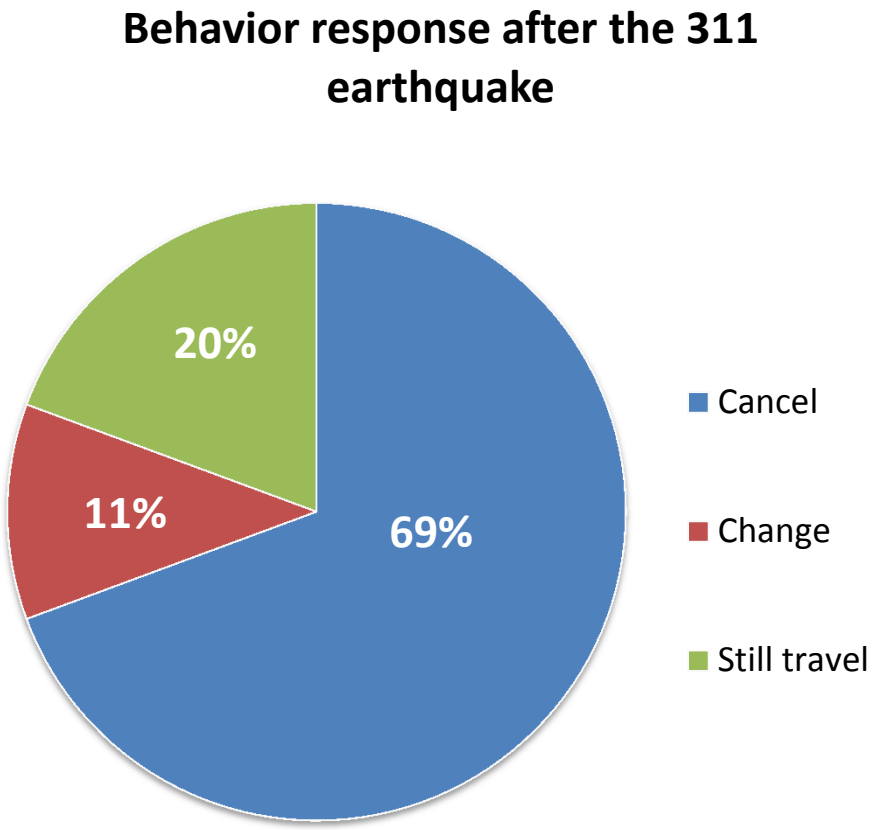
Duration



Destination



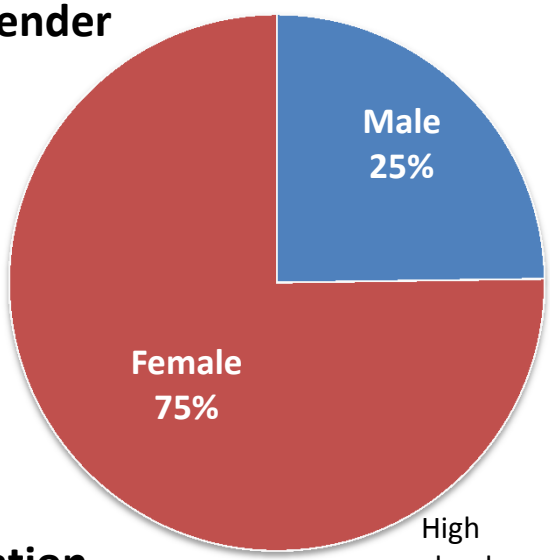
Data (South Korea)



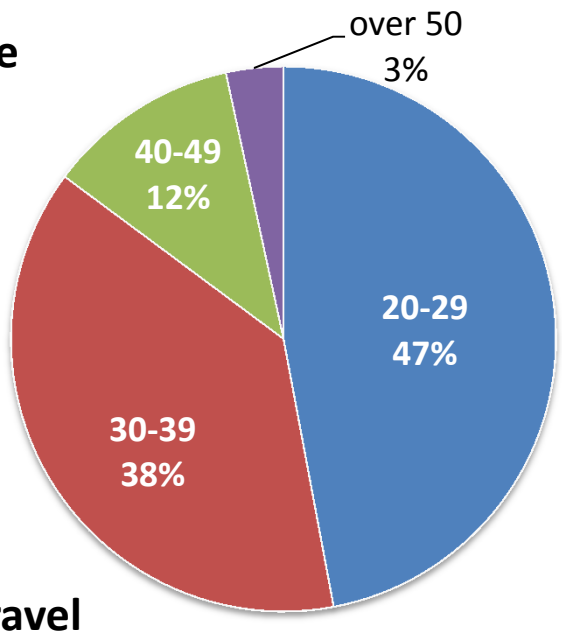
Data (China)

Individual characteristic

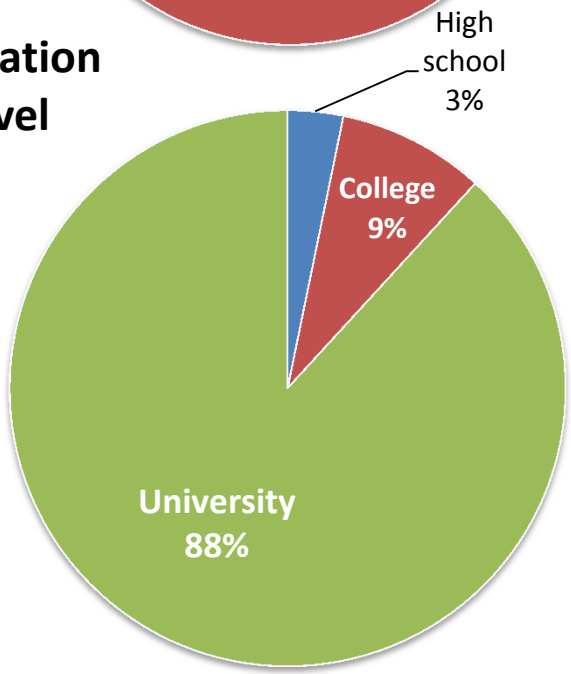
Gender



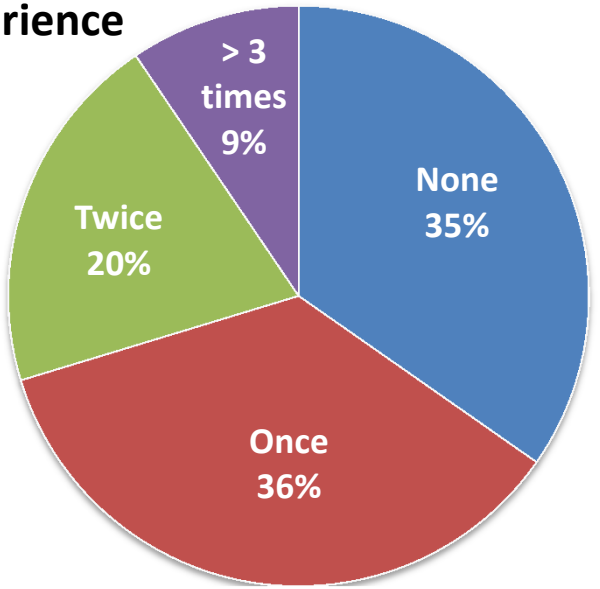
Age



Education level



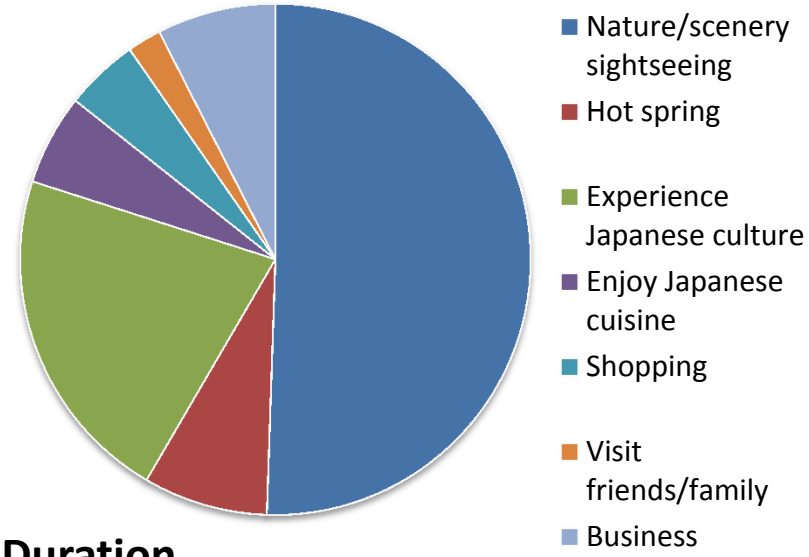
Travel experience



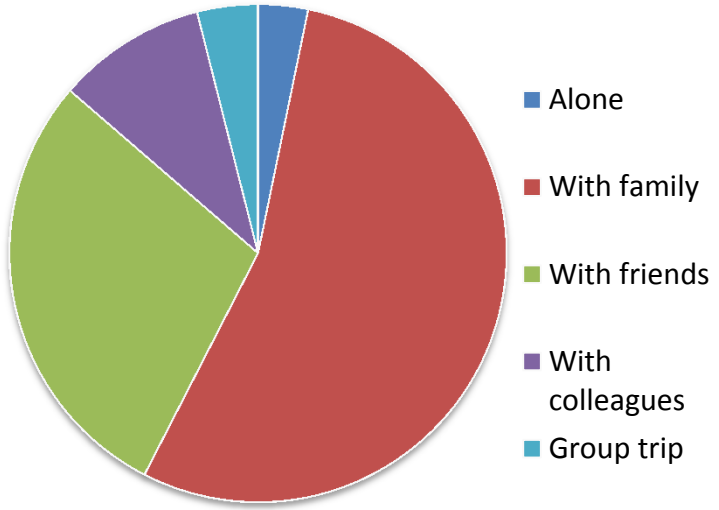
Data (China)

Planned travel schedule

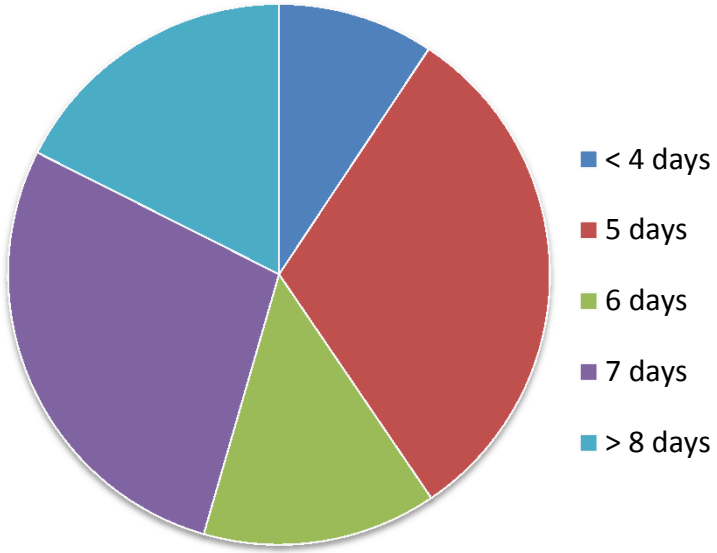
Motivation



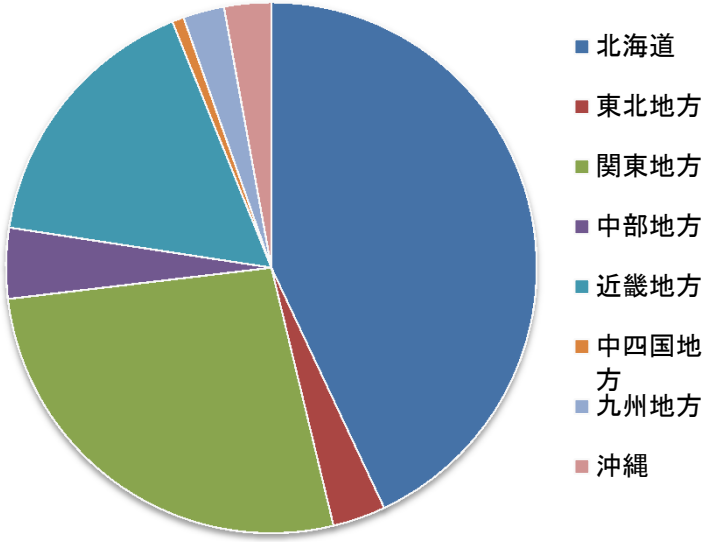
Companion



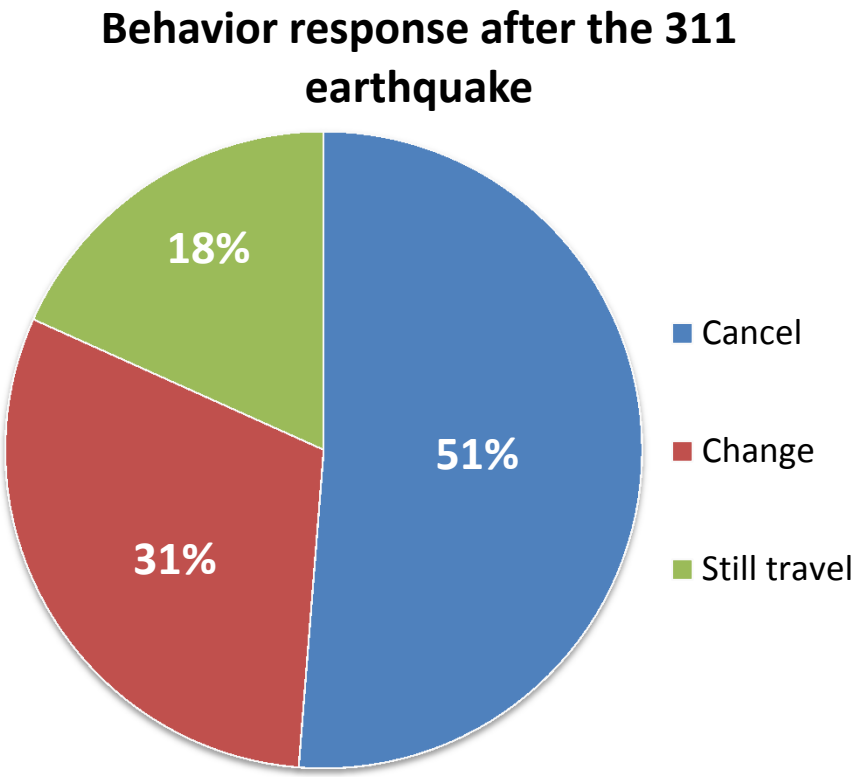
Duration



Destination



Data (China)


Behavior response after the 311 earthquake
18%
51%
31%
Cancel
Change
Still travel

Data analysis

The reasons why tourists would not travel to Japan following the earthquake

	Factor loading	Explained variance	Cronbach's α
Factor 1: Accessibility damage		28.9	0.88
The flight I planned to take was cancelled	0.88		
The group trip organized by my travel agency was cancelled	0.87		
Factor 2: Internal worry		23.2	0.82
I was worried about aftershock	0.73		
I was worried about the occurrence of natural disasters in Japan (e.g., earthquake, tsunami, typhoon, etc)	0.79		
I was worried about nuclear disaster	0.85		
I was worried about food being polluted by nuclear leakage	0.81		
Factor 3:External events		23.0	0.79
Appreciation of Japanese currency	0.79		
Increase of fuel tax	0.85		
Political conflict	0.74		
Total variance explained		75.1	

Data analysis

Difference in the reasons why tourists would not travel to Japan following the earthquake

Accessibility damage and external events are more important reasons for male tourists to cancel their trip; internal worry is more important reason for female.

	Accessibility damage	Internal worry	External events
Gender	F=11.3**	F=6.12**	F=5.76**
Male	2.08	3.47	2.35
Female	1.52	4.04	2.03

Data analysis

Difference in the reasons why tourists would not travel to Japan following the earthquake

With age increase, the influences of accessibility damage and internal worry decrease, but influences of external events increase.

	Accessibility damage	Internal worry	External events
Age	F=7.98**	F=6.72**	F=10.76**
< 30 years old	2.09	4.18	1.85
30~40 years old	1.75	4.08	2.33
> 40 years old	1.41	3.79	2.58

Data analysis

Difference in the reasons why tourists would not travel to Japan following the earthquake

By comparing with Korean tourists, tourists from China are more likely to cancel their trip because of accessibility damage and external events, but the influence of internal worry is lower for them.

	Accessibility damage	Internal worry	External events
Nationality	F=65.4**	F=6.5**	F=24.8**
China	2.11	3.77	2.33
South Korea	0.79	4.12	1.68

Data analysis

Difference in the reasons why tourists would not travel to Japan following the earthquake

Repeat tourists are more likely to be influenced by accessibility damage and external events, while first time tourists are more likely to be influenced by internal worry.

	Accessibility damage	Internal worry	External events
Travel experience	F=15.4**	F=7.21**	F=3.92*
None	1.35	4.15	2.05
Once	2.14	3.72	2.08
More than Once	2.28	3.66	2.43

Data analysis

Difference in the reasons why tourists would not travel to Japan following the earthquake

Tourists who use mass media as their major information source are more likely to be influenced by internal worry.

	Accessibility damage	Internal worry	External events
Information source	F=4.7**	F=9.41**	F=3.69*
Mass media	1.57	4.25	2.05
Otherwise	1.92	3.95	2.29

Data analysis

Difference in the reasons why tourists would not travel to Japan following the earthquake

Accessibility damage has relatively higher influence on business trip;
Internal worry has lower influence on tourists with motivation of culture;
External events have larger influence on tourists with motivation of natural, culture, or shopping.

	Accessibility damage	Internal worry	External events
Motivation	F=7.27**	F=8.21**	F=2.37*
Natural	1.31	4.23	2.28
Culture	1.36	3.79	1.94
Shopping	1.58	4.27	2.01
VFR	1.21	4.36	1.71
Business	1.94	4.22	1.66

Data analysis

Difference in the reasons why tourists would not travel to Japan following the earthquake

Tourists who travel with family or friends are more likely to cancel their trip because of internal worry.

	Accessibility damage	Internal worry	External events
Travel party	F=0.91	F=4.28**	F=1.10
Alone	1.89	3.77	2.21
With family	1.97	4.07	2.21
With friends	1.91	4.05	1.99
Others	1.85	3.85	2.32

Data analysis

The reasons why tourists would travel to Japan following the earthquake

	Factor loading	Explained variance	Cronbach's α
Factor 1:Accessibility improvement		26.7	0.89
The travel package provided by my travel agent was cheaper than before	0.85		
Flights became cheaper than before the earthquake	0.89		
A direct flight from my residential area to Japan became available	0.64		
Low cost carriers from my residential area to Japan became available	0.72		
It became easier to get a tourism visa	0.68		
Factor 2:Information communication		22.9	0.86
Advertisement on TV, newspaper, magazine.	0.71		
Recommendation from my friend who has traveled to Japan	0.85		
Recommendation on Social networking service (Facebook, Twitter, etc)	0.86		
I watched a drama which is shot in Japan, and I want to experience by myself.	0.75		
The media lessened my concerns regarding nuclear leakage	0.68		

Data analysis

	Factor loading	Explained variance	Cronbach's α
Factor 3:Internal willingness		22.3	0.92
I would like to witness how things have changed after the earthquake	0.69		
I would like to help the Japanese tourism industry to recover	0.84		
I feel sorry for the Japanese people affected by the disaster	0.79		
I believed I could offer some assistance	0.86		
I would feel guilty if I didn't do anything to help the tourism industry in Japan	0.86		
Total variance explained		71.9	

Data analysis

Difference in the reasons why tourists would travel to Japan following the earthquake

Information communication is more effective to promote female tourists to visit Japan;
Male tourists are more likely to travel to Japan out of internal willingness

	Accessibility improvement	Information communication	Internal willingness
Gender	F=1.02	F=8.08**	F=5.29**
Male	2.94	3.09	2.41
Female	2.81	3.35	2.03

Data analysis

Difference in the reasons why tourists would travel to Japan following the earthquake

Information communication is more effective to promote younger tourists to visit Japan;
Elderly tourists are more likely to travel to Japan out of internal willingness

	Accessibility improvement	Information communication	Internal willingness
Age	F=0.21	F=8.34**	F=4.08**
< 30 years old	2.83	3.29	2.12
30~40 years old	2.89	3.09	2.18
> 40 years old	2.82	2.94	2.33

Data analysis

Difference in the reasons why tourists would travel to Japan following the earthquake

Information communication is more effective to promote Chinese tourists to visit Japan;
Chinese tourists are more likely to travel to Japan out of internal willingness

	Accessibility improvement	Information communication	Internal willingness
Nationality	F=0.82	F=31.4**	F=2.86*
China	2.87	3.11	2.21
South Korea	2.63	1.81	1.72

Data analysis

Difference in the reasons why tourists would travel to Japan following the earthquake

Accessibility improvement is more effective to promote repeat tourists to visit Japan;
Information communication is more effective to promote first-time tourists to visit Japan;
Repeat tourists are more likely to travel to Japan out of internal willingness

	Accessibility improvement	Information communication	Internal willingness
Travel experience	F=2.79*	F=4.31**	F=6.14**
None	2.68	3.19	1.71
Once	2.74	2.96	1.93
More than Once	3.12	2.74	2.43

Data analysis

Difference in the reasons why tourists would travel to Japan following the earthquake

Tourists with motivation of natural and culture are more likely to be promoted by information communication;
Tourists with motivation of natural, culture or business are more likely to be promoted by their internal willingness

	Accessibility improvement	Information communication	Internal willingness
Motivation	F=0.68	F=2.91**	F=5.71**
Natural	2.95	3.11	2.26
Culture	2.79	3.11	2.11
Shopping	2.78	2.78	1.41
VFR	2.62	2.55	1.71
Business	2.62	2.45	2.36

Data analysis

Difference in the reasons why tourists would travel to Japan following the earthquake

The influence of information communication is highest among tourists who travel with family

	Accessibility improvement	Information communication	Internal willingness
Travel party	F=1.52	F=3.09**	F=0.49
Alone	2.76	2.41	2.11
With family	2.89	3.07	2.23
With friends	2.54	2.76	1.96
Others	2.85	2.39	2.17

Data analysis

Tourist's behavior response to the earthquake

In this study, tourists' post-disaster decision is analyzed by using the multinomial logit (MNL) model. There are three alternatives: cancel the travel plan, change the travel plan, and still travel as planned. The probability that individual *n* choose alternative *j* can be represented as:

$$P_{nj} = \frac{\exp V_{nj}}{\sum_{j'} \exp V_{nj'}}$$

Where V_{nj} represents the observable components of the utility function of alternative *j*, which is specified as:

$$V_{nj} = \alpha_j + \sum_h \beta_{hj} X_{hj}$$

where, α_j is constant term for alternative *j*; X_{hj} is the *h*th attribute describing alternative *j*.

Data analysis

Explanatory variables	Description
Gender	1: Male; 0: Female
Age	Actual age
Income	Annual household income
Education	1: having a university degree; 0: otherwise
Travel experience	Travel times to Japan in the last 5 years
Time interval	Time interval between the occurrence of earthquake and planned trip
Purpose	1: Tourism; 0: Business
Travel companion	1: Alone; 0: Otherwise
Perception1	The majority of Japan was directly affected by the earthquake
Perception2	After the earthquake, Japan was inaccessible
Perception3	Most of the affected area was not open for business after the earthquake
Perception4	Most of the tourism attractions in the affected area were inaccessible
Perception5	It was not safe to travel to Japan because of the aftershock
Perception6	It was not safe to travel to Japan because of the nuclear leakage
Perception7	Food in Japan has been polluted by nuclear leakage

Data analysis

Explanatory variable	China		South Korea	
	Cancel	Change	Cancel	Change
Gender	0.31	-0.09	-0.92	-1.31
Age	0.21	-0.22	0.38	0.49
Income	-0.04 *	-0.04	0.26	-0.11
Education	0.04	0.32	-1.61 *	-1.38
Travel experience	-1.08 **	0.06	-1.05 **	0.01
Time interval	-0.31 **	-0.24 *	-0.51	-0.37
Purpose	1.89 **	1.26 *	1.82	1.33
Travel companion	-0.42	-0.84	-0.14	-2.24
Perception1	0.35 **	0.45 **	0.85 **	0.49
Perception2	0.08	0.21	1.09 **	0.81 *
Perception3	0.06	0.12	0.03	0.12
Perception4	0.02	-0.01	-0.24	0.01
Perception5	0.58 **	0.28 *	1.07 **	0.55
Perception6	0.04	0.05	0.14 **	-0.35
Perception7	0.40 **	0.19	0.22 **	0.44
Initial log-likelihood	-586.7		-204.3	
Converged log-likelihood	-393.3		-83.4	
McFadden's Rho-squared	0.32		0.59	

* significant at the 10% level, ** significant at the 5% level

Summary

The study analyzes the reasons why international tourists would/would not travel to Japan following the earthquake.

Principal component analysis identified three factors in the reasons why international tourists would not travel to Japan following the earthquake, which can be labeled as "accessibility damage", "internal worry", and "external events".

Accessibility damage	Internal worry	External events
Male	Female	Male
Younger tourist	Younger tourist	Elderly tourist
Chinese tourist	Korean tourist	Chinese tourist
Repeat visitors	First-time visitors	Repeat visitors
Information source other that mass media	Mass media	Information source other that mass media
Business trip	With family or friends	With motivation of natural

Summary

Principal component analysis identified three factors in the reasons why international tourists would travel to Japan following the earthquake, which can be labeled as "accessibility improvement", "information communication", and "internal willingness".

Accessibility improvement	Information communication	Internal willingness
Repeat visitors	Female tourist	Male tourist
	Younger tourists	Elderly tourist
	Chinese tourist	Chinese tourist
	First-time visitors	Repeat visitors
	With motivation of natural and culture	With motivation of natural
	Travel with family	

Summary

International tourists' behavior response after the earthquake is analyzed by using MNL model.

The model estimation results suggest that income, post travel experience, time interval, travel purpose, and three elements of risk perception have significant influence on decision of tourists from China. While the most influential factors for tourists from South Korea include education level, post travel experience, and five elements of risk perception.

Thank you for your attention!