

The impact of regional railways on travel behaviour and social capital

Thredbo 16
25 to 30 August 2019
Singapore

Kiyohito Utsunomiya
Kansai University



Today's talk

- Background
- Methodology
- Survey area
- Results and discussion
- Concludig remarks

Background

Background

- Policy makers as well as transport practitioners are still sceptical about wider effects of public transportation, especially of regional railways.
- Most people rely heavily upon cars in those areas and only a limited proportion of residents near train stations use them.
- Actually, many regional railway lines have been replaced by bus services in line with CBA.



Background

- However, if social impact had been taken into consideration, policy decisions would have been different in some cases.
- In Austria, apart from cost benefit analysis, several rural regional railways have been modernized in recent years, and these seem to have had a positive impact on communities along the railway lines.

Methodology

Methodology in this paper

- Target two regional railway lines that have drastically changed their service levels in recent years.

Mariazell Railway & Pinzgau Railway in Austria

- Choose 400 sample residents per each area based on stratified random sampling method by age group and municipality.
- Narrow these samples down to respondents who have lived in the area before and after the service improvement.

Methodology in this paper

- Ask them if they have changed their travel behaviors and their relationship with others before and after the turning point using CATI (computer assisted telephone interview) by a specialized company in Austria.

Main questions

Do the following statements apply to you?

Q1 After the service improvement of XX Railway I go shopping more often than before.

...

Q5 Nothing changes after the service improvement of XX Railway.

Survey areas

Targeted passenger railway lines

Mariazell Railway (MR)

- 84km electrified narrow-gauge railway between St. Pölten in the Federal State of Lower Austria and Mariazell in the Federal State of Styria
 - CATI with the residents along the first 48km section of the line
- Transferred from the Austrian Federal Railways to the Federal State of Lower Austria in 2010
- Modernized since 2010, e.g. new rolling stocks, speed-up, fixed-interval services, etc.
- Total population of inhabitants of seven communities along the first 48 km section of the line excluding St. Pölten is 17 thousand.



Targeted passenger railway lines

Pinzgau Railway (PR)

- 53km non-electrified narrow-gauge railway between Zell am See and Krimml in the Federal State of Salzburg
- Transferred from the Austrian Federal Railways to the Federal State of Salzburg in 2008 because half of the line had been suspended due to a severe flood since 2005
- Completed in restoration of the whole line in 2010
- Modernized since 2010, e.g. new rolling stocks, speed-up, fixed-interval services, etc.
- Total population of inhabitants of ten communities along the line excluding Zell am See is 26 thousand



Results and discussion

Changes in "own travel behaviour"

MR area (n=390)	%						
	Total	By age					
		-29	30-39	40-49	50-59	60-69	70-
Go shopping more often	17.9	15.9	7.4	11.3	16.9	18.0	36.9
Participate in classes and clubs more often	6.1	7.2	1.9	9.9	6.2	6.0	4.6
Participate in regional festivals more often	30.7	40.6	29.6	25.4	29.2	32.0	27.7
Participate in volunteer activities more often	9.4	13	1.9	4.2	13.8	12.0	10.8
Go to entertainment such as sports, theater etc. more actively	22.7	30.4	18.5	15.5	27.7	18.0	24.6
Go out just for a change of air more often	28.1	36.2	18.5	15.5	38.5	30.0	29.2
Drive less	19.3	11.6	9.3	14.1	20	24.0	36.9
Ride other people's cars less	13.1	18.8	3.7	8.5	13.8	8.0	23.1
No change	39.6	34.8	53.7	46.5	29.2	38.0	36.9

PR area (n=393)	Total	By age					
		-29	30-39	40-49	50-59	60-69	70-
Go shopping more often	15.6	13.7	13.6	7.4	14	19.6	28.6
Participate in classes and clubs more often	5.6	0.0	8.5	5.9	8.8	7.1	2.0
Participate in regional festivals more often	20.3	13.7	20.3	13.2	28.1	32.1	14.3
Participate in volunteer activities more often	12.6	5.9	6.8	13.2	21.1	16.1	12.2
Go to entertainment such as sports, theater etc. more actively	17.1	25.5	18.6	10.3	15.8	16.1	18.4
Go out just for a change of air more often	20.3	15.7	15.3	16.2	19.3	33.9	22.4
Drive less	18.5	21.6	13.6	10.3	17.5	28.6	22.4
Ride other people's cars less	15.3	17.6	15.3	4.4	17.5	23.2	16.3
No change	52.1	47.1	50.8	70.6	52.6	39.3	46.9

Changes in “own travel behaviour”

- Around 50 to 60 percent of respondents think that something has changed in their travel behaviours.

---These results are almost the same as in Toyama, Japan, where a local branch line was revived as a new LRT in 2006 (Utsunomiya 2017).

- Older respondents over 60 and younger respondents under 30 have a tendency to change their behaviours.

Toyama Light Rail	Total
Go shopping more often	10.4
Participate in classes and clubs more actively	4.2
Participate in regional festivals more actively	5.7
Participate in NPO and other volunteer works more actively	1.1
Go to entertainment such as sports, theater etc. more actively	15.3
Go out just for a change of air more often	18.5
Drive less	25.3
Ride a car by others less	9.3
No change	39.3
Others	8.5

Toyama Light rail



Changes in “relationship with others”

%

MR area	Total	By age					
		-29	30-39	40-49	50-59	60-69	70-
Meet friends and acquaintances more often	19.5	17.4	7.4	15.5	27.7	12.0	33.8
Meet relatives more often	10.2	7.2	3.7	2.8	20.0	12.0	15.4
Meet neighbours more often	9.4	13.0	0.0	2.8	10.8	12.0	16.9
Expand new networks	10.7	13.0	7.4	8.5	10.8	6.0	16.9
No change	66.0	72.5	83.3	73.2	55.4	62.0	50.8

PR area	Total	By age					
		-29	30-39	40-49	50-59	60-69	70-
Meet friends and acquaintances more often	17.4	15.7	10.2	11.8	21.1	26.8	20.4
Meet relatives more often	12.4	15.7	6.8	5.9	17.5	10.7	20.4
Meet neighbours more often	7.1	2.0	1.7	4.4	12.3	7.1	16.3
Expand new networks	8.2	7.8	5.1	7.4	12.3	8.9	8.2
No change	70.9	72.5	76.3	80.9	70.2	60.7	61.2

Two answers, “no change” in own travel behaviors and in relationship with others are not independent of each other at a significance level of 1%.

Changes in “relationship with others”

- Around 30 percent of respondents indicate some changes.

---These results are almost the same as in Toyama, Japan (Utsunomiya 2017).

- Older respondents over 50 tend to change their relationships with others.

Toyama Light Rail	Total
Meet friends and acquaintances more often	20.0
Meet relatives more often	4.7
Meet neighborhoods more often	3.6
Expand new networks	6.2
Nothing changes	63.3
Others	4.5

“Meet friends and acquaintances/
relatives/ neighbours more often”

⇔ bonding social capital

“Expand new networks”

⇔ bridging social capital.

Logistic regression on changes in own travel behaviour and in the relationship with others

➤ Dependent variables

14 answers to 14 questions in each area (Yes: 1, No: 0)

➤ Explanatory variables

7 attributes (Job status, commuter, change trains, car availability, family size, place of residence, and age)

Results (changes in own travel behaviour)

Odds ratio

Dependent variable		Explanatory variable						
MR area	Job status	Commuter	Change trains	Car availability	Family size	Place of residence	Age	
1) Go shopping more often	-	-	-	0.60 ***	-	1.24 ***	1.03 ***	
2) Participate in classes and clubs more actively	-	-	0.41 *	4.27 **	-	-	-	
3) Participate in regional festivals more actively	-	-	0.57 **	-	1.22 **	1.15 **	-	
4) Participate in volunteer activities more often	0.23 ***	-	-	1.88 **	1.45 **	-	-	
5) Go out just for a change of air more often	0.51 **	0.39 **	0.61 *	-	-	-	-	
6) Drive less	-	0.21 ***	0.39 ***	-	-	1.13 *	1.05 ***	
7) Ride other people's cars less	0.35 ***	0.45 *	-	0.68 **	-	1.15 *	-	
8) No change	1.61 **	-	2.35 ***	-	-	0.86 **	-	

Note 1. Only significant models at 10 % level by chi-square tests are shown, 2. ***: p<0.01, **: p<0.05, *<0.10

Results(changes in own travel behaviour)

Dependent variable		Explanatory variable					Odds ratio
PR area	Job status	Commuter	Change trains	Car availability	Family size	Place of residence	Age
9) Go shopping more often	-	-	-	-	0.75 **	-	-
10) Participate in classes and clubs more actively	8.45 ***	-	-	-	-	0.75 **	1.04 **
11) Participate in regional festivals more actively	-	-	-	-	-	0.86 **	-
12) Participate in volunteer activities more often	-	-	-	-	-	-	1.03 **
13) Go out just for a change of air more often	-	2.60 *	-	-	-	-	-
14) Ride other people's cars less	0.47 **	-	-	-	-	-	-
15) No change	-	-	1.91 **	-	-	-	-

Note 1. Only significant models at 10 % level by chi-square tests are shown, 2. ***: p<0.01, **: p<0.05, *<0.10

Job status 0: Pupil, Apprentice, Student, Pensioner, Unemployed, Maternity or parental leave, Housewife, Househusband
1: Office worker, Factory/field worker, Self-employed, Farmer

- Non-workers have changed their travel behaviours, although non-workers in the PR area are significantly negative to "participate in classes and clubs more actively."
- People travelling inside their areas tend to change their travel behaviours.
- Ages have some consistent effects on residents' behaviours.

Results (changes in relationship with others)

Odds ratio

Dependent variable		Explanatory variable					
MR area	Job status	Commuter	Change trains	Family size	Place of residence	Age	
1) Meet friends and acquaintances more often	-	-	-	-	1.19 **	1.03 ***	
2) Meet relatives more often	-	0.33 *	-	-	-	1.04 ***	
3) Meet neighbours more often	0.28 ***	-	-	-	-	-	
4) Expand new networks	0.26 ***	0.41 *	-	-	-	-	
5) No change	3.60 ***	2.07 *	1.94 **	1.22 *	-	-	
PR area	Job status	Commuter	Change trains	Family size	Place of residence	Age	
6) Meet friends and acquaintances more often	0.53 *	-	-	-	-	-	
7) Meet relatives more often	-	4.41 **	-	-	-	-	
8) Meet neighbours more often	-	-	-	-	-	1.04 **	
9) No change	1.87 **	-	-	-	-	-	

Note 1. Only significant models at 10 % level by chi-square tests are shown.

Note 2. ***: p<0.01, **: p<0.05, *: p<0.10

- The improvement to railway services encourages the elderly and non-workers to meet others more often than before.
 - It also helps non-workers to expand new networks in the MR area.
- ⇒ Convenient railway services could strengthen bonding social capital especially among elderly non-workers and build bridging social capital, to a certain extent.

Concluding remarks

Concluding remarks

- More than half of respondents reported “changes” in their travel behaviour.
- By category, they most likely to answer “participate in regional festivals more often” and “go out just for a change of air more often.”
- Non-workers and/or elderly people tend to change their travel behaviour within their local area.

Concluding remarks

- A number of respondents reported a “change” in relationships with others.
 - Bonding social capital could have been strengthened among elderly non-workers.
 - In the MR area, bridging social capital, especially among non-workers seems to be strengthening.
- ⇒ Considering that old-age pensioners are generally at higher risk of being socially excluded, **convenient railways in regional areas could function to solve such a problem by nourishing the social capital of the residents along the line.**

Thank you for your attention.