

World Conference on Transport Research - WCTR 2016 Shanghai. 10-15 July 2016

Social Exclusion Related To Mobility in Urban Area

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Abstract

The concept and methodology of social exclusion is imported to understand transportation for a people who have low mobility. There are many previous works in social welfare territory about social exclusion. First step is to select a list of outgoings necessary for normal social life. Second step is that exclusion criteria is determined considering component rate for each number of indicator. Third step, using this result the man who is excluded prefer share-ride and individual transportation either. Indicator calculated status of the achievement of this list for each person. Reliability of this indicator is examined using a data of questionnaire survey from case study area. Considering the data of case study area 1 or more is selected as the criteria. It is mentioned size of area discussing transportation planning.

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Peer-review under responsibility of WORLD CONFERENCE ON TRANSPORT RESEARCH SOCIETY.

Keywords: Public transport, Special transport, Level of service ;

1. Introduction

1.1. Background

To maintain daily life, many activities are needed, not only fundamental activities, for example seeing a doctor regularly or buying daily necessities, but also social activities or cultural activities.

There are persons who cannot attain activities. But it is too high burden to provide activities for all people. It is necessary to discuss what activities should be eligible for social security in our society. Then in this paper it is discussed

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eligibility of these activities based upon concept of social exclusion. This concept is discussed in Social Science (Social Welfare).

Social exclusion is defined as “the process in which individuals or entire communities of people are systematically blocked from (or denied full access to) various rights, opportunities and resources that are normally available to members of a different group, and which are fundamental to social integration within that particular group”. Under the concept of social exclusion, eligible person for public help is decided relatively.

1.2. Literature Review

Concept of Social exclusion was come from researches of poverty. Townsend advocated concept of Relative Deprivation. And Townsend (1979) defined Relative Deprivation Index. This index included 60 items in 12 categories. These categories were food, health, housing, working environment, social environment and so on. Relative deprivation was expressed the number of items that respondent answered that they own (if items were action, questions would change that they could act). This index was intuitive and easy to understand. But it was criticized that index was selected arbitrarily by researchers. Then, validity of this list of index that expressed status of peoples, especially relative deprivation, had been discussed, as research about social exclusion. These list were called Socially Perceived Necessities (SPN). Gordon & Pantazis (1997) examined social consensus about unacceptable standard of living in UK and defined SPN. In Japan, SPN has been discussed, for example, Reiko Goto et al.(2004), Aya Abe(2004) (2007), Hideaki Kikuchi(2007). These SPN were targeted for everything else in people's life. Relationship between transportation policy and SPN is difficult understand. To discuss mobility in urban area, it is required SPN that is targeted that influenced by transport circumstance.

There were some researches about transport policy that were introduce concept of social exclusion. Harada et al. (2006) defined social exclusion caused by transportation as “those who had no ways and means to go to hospital”. And Makoto Chikaraishi et al. (2011) defined social exclusion caused by transportation as “those who travel short distance or time”. And Harada's index is expressed limited circumstance. People's daily living is consisted from many activities. Chikaraishi's index ignored circumstance of their living. If the person who lived rural area, that is their home located far from shop and hospital, could travel long distance, he could access and satisfy his necessities. Considering outcomes of social science, SPN influenced by transport circumstance is necessary to develop.

1.3. Purpose of this study

A purpose of this study is to develop identifying method of mobility impaired person based upon social exclusion, to understand transportation that solve their social exclusion. This identifying method is put a high priority on personal availability of motilities and transport circumstance. This transport means not only public transport but also special transport service. Special transport service provide individually transport for high mobility impaired.

Referring result of social science, SPN related to mobility is defined. And it is discussed with availability mobility policy of urban area.

2. Methodology

2.1. Outline

The target of this study, social excluded related to mobility is necessary to define. This definition process is based upon previous research in social science. Especially previous research by Aya Abe (2004) is used as a reference. According to Abe, the definition process of social exclusion is summarized in three steps.

1st step is listing of SPN. Considering local life and surroundings, and referring previous research, the list of necessities to achieve local life is composed.

2nd step is asking SPN to residents. “Lack” of items of SPN is state that when the respondent want to achieve, but he could not achieve. This question targeted the state during most recent 1 year.

3rd step is setting exclusion criterion of SPN. Number of items of SPN that is answered “lack” is summarized. Composition ratio for each number of lacked items of SPN is calculated. Considering this ratio, exclusion criterion is decided by number of lacked items of SPN.

This research focused on influences of transportation policy. SPN is necessary to selected by judgement standard that items of SPN is influenced by transportation circumstance. Considering previous research SPN is selected. And considering in 2nd step lacked items are needed limit only items that are related to transportation circumstance of each respondent. Question of SPN is composed 3 questions. First question is to ask respondent’s annual experience for each items. Second question is to ask respondent if the respondents want to experience, but he could not experience lacked items. Last question is to ask the reason of lack of items. Exclusion criterion is discussed based upon previous SPN research that was focused on all daily life.

2.2. Listing and Questioning SPN

Social exclusion unit of UK government (2003) released a report concerned about social exclusion. And in this report there was section of social exclusion related with mobility. The list is shown in Table1. In this study list of SPN is composed based upon this list. Because (5)(a) “public service“ and (5)(c) “Social activities, leisure” in the list indicate broadly, it is necessary to complement these items. Additionally referring Aya Abe (2007), “public service“ and “Social activities, leisure” are divided each 4 sub-items. List of SPN for this study is shown in Table 2.

For considering transportation policy using social exclusion, it is necessary to get rid of other influences except for transport. Then, it is necessary to ask reason why they cannot achieve SPN. In the case respondents answered that they have experienced that they cannot achieve items of SPN and that the reason of this experience is given from transportation. It is called in this study “lack of SPN given from transportation circumstance (ML-SPN)”. Sample of asking SPN is shown in Fig.1.

Table 1. Activities that is influenced by transportation and contribute to social exclusion

Division	Items
Working	Job-hunting and job-interviewing
	Commuting to office
Education	Learning activities at outside of school
	Commuting to school
	Education continuance
	Job training
	Transport for childcare facilities
Medical	Medical care
Shopping of food	Shopping of foods
Social activities, Cultural activities, Sports	Public service
	Enjoying friendship
	Social activities, leisure

Adapted from Social exclusion unit of UK government (2003)

Table 2. Items of SPN of this study

Division	Items	
(1) Working	(1-a) Job-hunting and job-interviewing	
	(1-b) Commuting to office	
(2) Education	(2-a) Learning activities at outside of school	
	(2-b) Commuting to school	
	(2-c) Education continuance	
	(2-d) Job training	
	(2-e) Transport for childcare facilities	
(3) Medical	(3) Medical care	
(4) Shopping of food	(4) Shopping of foods	
(5) Social activities, Cultural activities, Sports	(5-a) public service	(5-a-1) Library
		(5-a-2) Municipality office
		(5-a-3) Public health department
		(5-a-4) Park
	(5-b) Enjoying friendship	
	(5-c) Social activities, leisure	(5-c-1) Activates of neighbourhood association
		(5-c-2) Volunteer activities and social service activities
		(5-c-3) Hobbies and sports
		(5-c-4) Other activities that have periodic meetings

Q1 Have you ever been not able to buy food needed for your family in this one year?

Yes, I have.

It is not necessary for me.

No, I have never.

Q1' If Yes, is it a reason of transportation?

Yes, it is.

No, it is not.

Fig. 1. Sample of questionnaire sheet for SPN .

2.3. Criteria of excluded

Criteria of excluded is expressed by number items of ML-SPN. Rate of those who was social excluded was subject to criteria of excluded. Aya Abe(2007) set criteria of excluded in such a way that rate of those who was social excluded was from 10% to 20%. To set rate of those who excluded is one of candidate of this criteria. But this criteria would be tolerance. Because this Abe's research was targeted whole life. Beside in her research those who was excluded from "public transport service" was 4%. This criteria would be intolerance because it was targeted not all transportation circumstance but public transport. In this study criteria is set in such a way that rate of those who was social excluded was from 4% to 20%.

3. Case study

3.1. Outline of case study area

Case study is conducted in Hirabayashi, Suminoe-ku, Osaka city. Osaka city is second largest metropolitan area in Japan. And Suminoe-ku is one of metropolitan borough of Osaka city. 6,856 people dwelled and 21.6% of population are over 65 age's in 2010. Hirabayashi locate south-west end of Osaka city. There are 3 stations of Automated Guideway Transit (AGT) in Hirabayashi area. AGT line connect with Metro line that provide access for downtown of Osaka city. Local bus service is provided ever 2hour but there is no bus stop in Hirabayashi-residential area. Free bus for elderly people that was operated by Osaka city provided in 2013. This free bus threaded its way through local bus and connected Hirabayashi area and town center of Suminoe-ku. But this fee bus provided 2 days in week and 4 times per day. Hirabayashi is consisted from residential area and industrial area. There are only small shops and facilities. Considering shops and facilities, items of SPN that can be satisfied in Hirabayashi are listed in Table 3. Most of items is difficult to satisfy in Hirabayashi area. On the other hand town center of Suminoe-ku have some large shops and facilities. Most of items can be satisfy at town center of Suminoe-ku. Transport for town center of Suminoe-ku is needed to satisfy SPN. If items were FI in Table 3, it would be indicated that it was needed enhancement of mobility at inside of Hirabayashi. On the contrary if items were FO, it would be indicated that it was needed enhancement of mobility between Hirabayashi and surrounding area.

Table 3. Feasibility of SPN in Hirabayashi

Division	Items	Feasibility in Hirabayashi
(1) Working	(1-a) Job-hunting and job-interviewing	<i>DP</i>
	(1-b) Commuting to office	<i>DP</i>
(2) Education	(2-a) Learning activities at outside of school	<i>FO</i>
	(2-b) Commuting to school	<i>DP</i>
	(2-c) Education continuance	<i>DP</i>
	(2-d) Job training	<i>FO</i>
	(2-e) Transport for childcare facilities	<i>FI</i>
(3) Medical	(3) Medical care	<i>FO</i>
(4) Shopping of food	(4) Shopping of foods	<i>FI (FO)</i>
(5) Social activities, Cultural activities, Sports	(5-a-1) Library	<i>FO</i>
	(5-a-2) municipality office	<i>FO</i>
	(5-a-3) public health department	<i>FO</i>
	(5-a-4) Park	<i>FI</i>
	(5-b) enjoying friendship	<i>DP</i>
	(5-c-1) Activates of neighbourhood association	<i>FI</i>
	(5-c-2) Volunteer activities and social service activities	<i>FI</i>
	(5-c-3) Hobbies and sports	<i>FO</i>
	(5-c-4) Other activities that have periodic meetings	<i>DP</i>

FI Feasible at inside of Hirabayashi

FO Feasible at outside of Hirabayashi but inside of Suminoe-ku

FI (FO) Feasible at inside of Hirabayashi, but there is only small shop. Considering necessities it is necessary to go outside of Hirabayashi

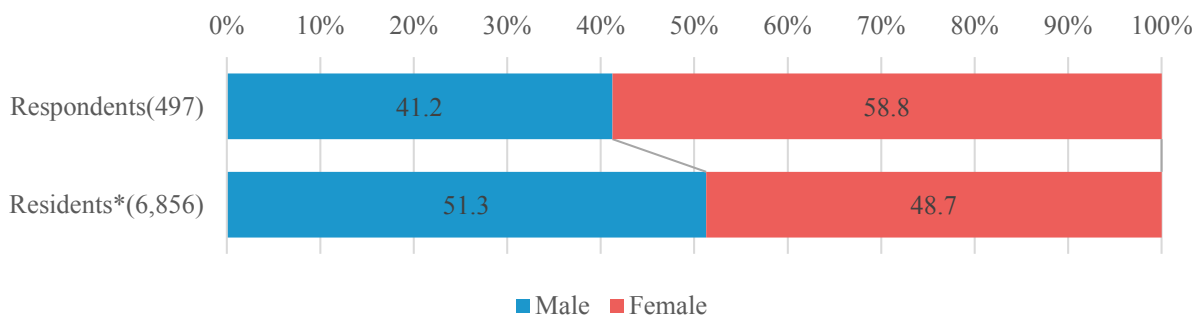
DP Feasibility is depending upon personal situation

3.2. Outline of Questionnaire survey

Outline of questionnaire survey is shown in Table 4. Comparison among respondents and resident in gender and age structure is shown in Fig.2 and Fig.3. There are statistically-significant difference between respondents and resident by 1% chi square test.

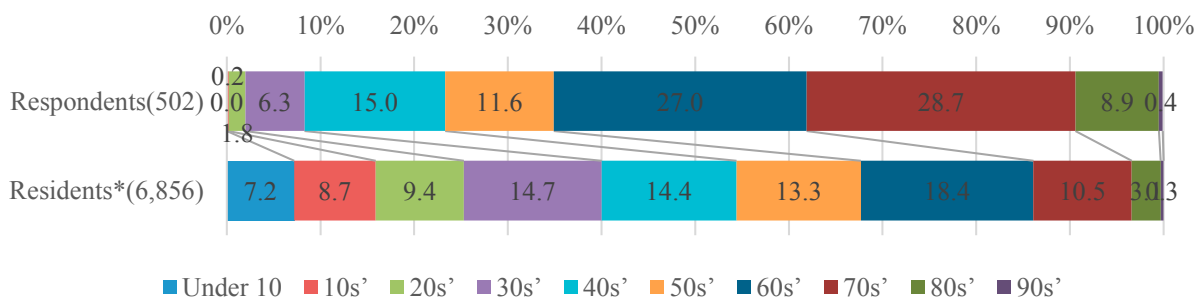
Table 4. Outline of questionnaire survey in Hirabayashi

Questionnaire book delivered	Posted one book for every household in Hirabayashi As a result 2,892 books were delivered
Questionnaire book returned	Books were returned by mail 502 books were returned. Returned rate is 17.8%
Date	From 2013.Nov.28 th to Dec. 10 th



*from Basic Resident Register in 2012.Nov.10.

Fig. 2. Comparison among respondents and residents in gender structure



*from Basic Resident Register in 2012.Nov.10.

Fig. 3. Comparison among respondents and residents in age structure

3.3. Social excluded person

Percentage of respondent that answered ML-SPN is shown in Fig.4.

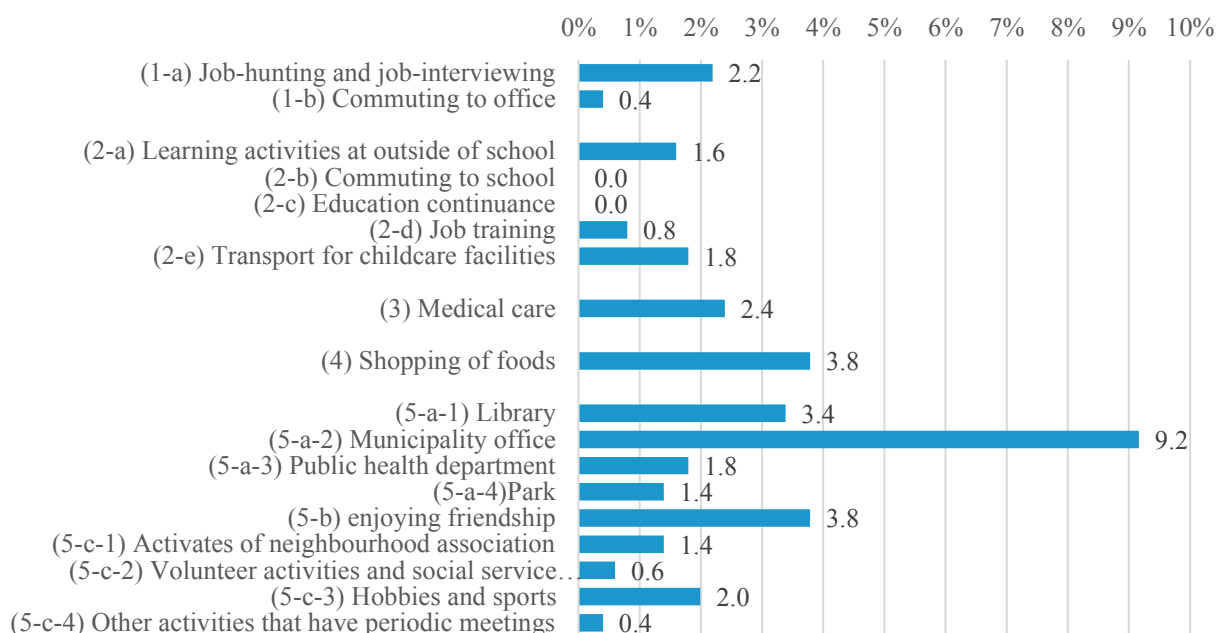


Fig. 4. Percentage of lacked SPN

Summary table of ML-SPN is shown in Table 5. In this study criteria of excluded is set as rate of those who was social excluded is from 4% to 20%. In table 5 determining using cumulative composition ratio on table 5, from 4% to 20% is equivalent to “over than 1 item”, “over than 2 items” and “over than 3 items”. In this study “over than 1 item”, “over than 2 items” and “over than 3 items” is selected as criteria of excluded. And correlation analysis and discussion are conducted for each criteria of excluded.

Table 5. Number of items of ML-SPN

Number of items	Number of respondents	Cumulative composition ratio for 502 respondents (%)
Over than 1item	89	17.7
Over than 2items	45	9.0
Over than 3items	27	5.4
Over than 4items	15	3.0

Number of items of ML-SPN is expanded to residents of Hirabayashi at rate proportional to component ratio of gender and ages. Because there are differences in component ratio of gender and ages between respondents and residents. Expanded number of items of ML-SPN is shown in Table 6.

Table 6. Expanded number of items of ML-SPN

Number of items	Number of respondents	Cumulative composition ratio for 502 respondents (%)
Over than 1item	175	2.6
Over than 2items	1,049	15.5
Over than 3items	469	6.9
Over than 4items	288	4.3

3.4. Discussion about characteristics of Social excluded person

At first criteria of excluded is set as "Over than 1item". The respondent who have over than 1item in ML-SPN is called as "social excluded in mobility (S.E.M.)". Relationship between SET and individual attributes is examined. Individual attribute is consisted by necessity of special transport service (STS), income group and destination of their trip. Generally speaking STS provide door to door service, high care service and lift equipped car or ramp car.

Because STS provided high level of service by low price, asking demand for STS give over demand. It is necessary to discriminate necessity of STS not from respondent's demand but from respondent's physical status and ability. Necessity of STS can be discriminated using equation (1). This equation provided objective discrimination from answers for activities of daily living. This equation is suggested by Hiroto INOI(2010).

$$S = -0.742x_{11} - 0.67x_{12} + 1.004x_{13} + 1.151x_{14} - 0.193x_{21} - 0.031x_{22} + 0.247x_{23} \quad (1)$$

$S > 0$ then he needed STS. $S < 0$ then he can use local bus service

x_{11} stand for those who answered "Achievable" for "Going up and down short slope"

x_{12} stand for those who answered "Achievable with hand rail" for "Going up and down short slope"

x_{13} stand for those who answered "Achievable with human assist" for "Going up and down short slope"

x_{14} stand for those who answered "Unachievable" for "Going up and down short slope"

x_{21} stand for those who answered "Not using any assistive instrument" for "Using assistive device at walling"

x_{22} stand for those who answered "Using walking assistive instrument" for "Using assistive device at walling"

x_{23} stand for those who answered "Using wheelchair" for "Using assistive device at walling"

Cross table of necessity of STS and ML-SPN is shown in Table 7. There is significant difference between necessity of STS and ML-SPN using 1% chi-square test. Social excluded person by mobility is needed STS. To solve social exclusion in mobility, STS is needed. Improving local bus service is not enough for solving social exclusion in mobility.

Table 7. Social excluded in mobility (S.E.M.) and necessity of STS

Those who designated as	Those who is S.E.M.	Those who is not S.E.M.	Sum
Those who can use local bus service	80 (92.0%)	384 (98.5%)	464(97.3%)
Those who need STS	7 (8.0%)	6 (1.5%)	13(2.7%)
Sum	87 (100%)	393(100%)	477(100%)

And cross table of income group and S.E.M. is shown in Table 8. There is significant difference between composition ratio of S.E.M. and income group using 1% chi-square test. Subsidization policy for transportation charge is effective for solving S.E.M.

Table 8. S.E.M. and income group

“Those who answered their household income and expenditure is”	Those who is S.E.M.	Those who is not S.E.M.	Sum
Very good	20 (25%)	37 (9.7%)	57 (12.4%)
Good	27 (33.8%)	104 (27.3%)	131 (28.4%)
Balanced	30 (37.5%)	207 (54.3%)	237 (51.4%)
Bad	3 (3.8%)	23 (6%)	26 (5.6%)
Very bad	0 (0%)	10 (2.6%)	10 (2.2%)
Sum	20 (25%)	37 (9.7%)	57 (12.4%)

STS provided not only inside Hirabayashi but also outside, included downtown of Osaka city. As mentioned above concerning STS, if appropriate discriminate is provided, service provided freely and STS can solve S.E.M. But not local bus service. To discuss trip destination have a beneficial effect on to determine catchment area of local bus service. It is shown in table 9. composed ratio of destination of trip of those who corresponded to S.E.M. and designated as those who can use local bus service. 37.5% is answered that to satisfy their necessity is needed to go outside of Suminoe-ku. Free bus and local bus service put roll of feeder service of metro and service area is divided by boundary of metropolitan borough. But considering solving S.E.M. by local bus, it is necessary to provide service beyond boundary of metropolitan borough. It indicated necessity of reorganization roll of local bus services.

Table 9. Composed ratio of destination of trip those who corresponded to S.E.M. and designated as those who can use local bus service

Inside of Suminoe-ku	90 (62.5%)
Outside of Suminoe-ku	54 (37.5%)
Sum	144 (100%)

Same comparison is conducted for other social excluded criteria. Same conclusion is acquired. Putting together that “Over than 1item” is tolerant criteria for mobility impaired people, “Over than 1item” has eligibility as social excluded criteria.

4. Conclusion

In this study to discuss transportation policy for mobility impaired people, concept of social excluded is applied. Based upon social science, it was suggested list of items social excluded related to transportation circumstance and questioning sheet. Additionally from previous study in social science and result of case study social excluded criteria is fixed. If respondent answered over than 1 item that is listed social excluded related to transportation circumstance.

And from case study, transportation that solve related to transportation circumstance is discussed. Significance of STS and local bus service is indicated. And concerned about local bus service, it is indicated necessity of reorganization roll of local bus services in metropolitan local transportation system.

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