

CHARACTERISTICS OF NEIGHBORHOOD TRAFFIC PROBLEMS SPECIFIED BY SILENT GROUP

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ABSTRACT

Residents often have totally different opinions on neighbourhood traffic issues. This study verified the character of neighbourhood traffic problems, which causes various apprehensions among residents, and its effect on the silent group, aimed at developing the proper participation system. In conclusion it was found that awareness about neighbourhood traffic problems are difficult to share for residents, and the difficulty is related to the complicated extension of locations where residents perceive traffic problems. The character seems to create where the “spiral of silence” occurs. Regarding the problem finding stage of transportation planning, it was suggested the character of neighbourhood traffic problems does not influence the existence of the silent group. However, it was also suggested that the level of awareness about traffic problems relates to the residents’ behaviour of silence.

Keywords: resident participation, traffic calming project, questionnaire survey

INTRODUCTION

Difference of Residents’ Perception on Neighbourhood Traffic Problems

Have you ever faced a situation where residents have totally different opinions on neighbourhood traffic issues although they are living in the same neighbourhood? Their opinions may be like this: “I think our neighbourhood is seriously dangerous” and “I never feel danger in this area”. The difficulty of achieving consensus in resident participation processes in neighbourhood transportation projects seems to be often delivered from such differences in the perception of the current situations. If opinions about neighbourhood traffic issues are comparably hard to share among residents, it may be too difficult for residents to carry on the discussion until they reach a consensus and it may be too heavy a load on one of the residents to play the role of the mediator in public participation activities. Furthermore there is

a possibility that such a load encourages people to become the “silent group” (Kojima and Kubota, 2009), who do not state their opinions.

Some previous studies suggest that the attitude of silence is affected by perception of differences in opinion between oneself and others. Noelle-Neumann (1993), a political scientist, has worked on effects of opinion difference between individuals and others. She has shown, as the famous theory of “spiral of silence”, that when each individual think his/her opinion belongs to the minority, they decline to make a statement from fear of isolation; this result in the minority becoming even more of a minority. It suggests that being aware of the opposite side of opinions discourages individuals from expressing their own opinions. Oshagan (1996) has shown that the “spiral of silence” occurs when the opinion distribution of a reference group, for example friends and family, opposes the individual’s opinion. Considering neighbourhood traffic calming projects, residents groups seem to be a kind of a reference group for each resident. Buchanan and Tullock (1962) have proposed that the cost for public choice is composed of two kinds of costs; the first one is “decision making cost”, which is used for discussion, persuasion, and negotiation, the second is “external cost”, which occurs because of troubles after the consensus building process. If there is no agreement among residents about neighbourhood traffic problems, the “decision making cost” increases and people may not attend resident participation activities, in other words, they refuse to pay the cost. This study verifies the character of neighbourhood traffic problems, which causes various apprehensions among residents, and its effect on the silent group, aimed at developing the proper participation system.

Limited Impact of Neighbourhood Traffic Problems

We focus on the limited impact of neighbourhood traffic problems to describe their character, which is expected to affect the silent group. Traffic problems seem to occur and suffer people in limited time and at limited locations such as morning and evening peak hours and high-accident intersections. Because of such limited impacts, each resident may have a different view on traffic problems according to their lifestyle pattern and regular route in their neighbourhood, even if all of them live in the same neighbourhood. On the other hand, most other problems that bother neighbourhoods; for example, graffiti, noise, and landscape disturbance, may be limited in space, but may not be limited in time. In addition, in most cases people may be suffer from these problems near their houses so they would comparatively easily share their common awareness of the issues with their neighbours. Meanwhile, an example of an issue that is not limited in time or space would be problems related to social security; these might be called general issues.

The differences in how issues are limited may define the extent of the issue’s impact on residents. The level of complexity of the extent may affect the difficulty of sharing awareness of the issues in a neighbourhood and the existence of the silent group. In this research, in order to describe the character of neighbourhood traffic problems, we compare neighbourhood traffic problems to other two issues which have different limitations in time or space; one is noise problems, which is limited in space, and the other is social security and health issues, which is not limited in time and space (Table - 1). We conducted questionnaire

surveys on these three topics in a residential area and analysed how each issue affect residents' perception. In addition, we examined how the character of the neighbourhood traffic problems influences the attitude of silence.

Table - 1 How each issue's impact is limited in time and space

	In time	In space
Impact of neighbourhood traffic problems	Limited	Limited
Impact of noise problems	Not so limited	Limited
Impact of social security issues	Not limited	Not limited

Definition of the Silent Group in this Research

Although issues related to silent groups have been a common interest in transportation planning, there has been no specific research on the silent group's behavior in the field of transportation planning. On the other hand, various studies on silent groups have been conducted in the fields of politics and social psychology. Research on abstention from votes has accumulated (Miyake,1989; Yanai, 1986; Kabashima, 1988), and many studies about non-respondents to opinion polls have been conducted from the viewpoint of the bias which could be caused by non-respondents (DeMio, 1962; Groves, 1992; Tsuchiya, 2005). Researchers in experimental social psychology have devoted considerable effort to raising the response rates of attitude surveys (Wilson, 1996). Kojima and Kubota (2009) have listed researches on non-respondents in attitude surveys and the methods used to capture information about the non-respondents in these researches (Table 2). In social science, many researchers have analyzed non-respondents using follow-up surveys.

Referring to those researches, we define the "silent group" as people who do not reply to questionnaires within a fixed time limit and treat the opinions from people who responded to the follow-up survey as part of the opinion of the "silent group". The other part of the "silent group" is literally silent, so their actual opinions are not accessible. Furthermore, it is impossible to be confident that the opinions from the respondents to the follow-up represent the opinions of the "silent group". However, the comments that were captured by the follow-up are from individuals who initially did not express their opinions. So we regard the captured opinions as a best possible approximation to the thought of the silent group.

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Table 2 - Researches on non-respondents to various surveys (Kojima and Kubota, 2009)

	Survey Topic	Analysis Item	Capture method of Non-respondents	Finding
DeMaio, T. 1980	demographic statistics	attributes reason for refusal relationship between refusals and the Privacy Act	Interview survey is conducted eight times to each target person and the refusers are visited next month in a follow-up survey.	The first interview tends to be refused more often than the following ones. The refusal rate differs by age and settled area. Race and gender do not relate to the rate. Preventing invasion of privacy and discomfort of past surveys rank high in the reasons for refusal.
Fujita, Y. 1983	general opinion polls	attributes opinions of late respondents after reminders	Reminders are mailed to non-respondents to mail surveys 1 week and 2 weeks after sending the questionnaire sheets.	Proportions of men and people in their fifties are smaller in the late respondents. The later respondents skipped more items, gave “don’t know” or negative opinions more frequently and know less about the questionnaire items.
Sugiyama, A. 1984	general opinion polls	attributes effect of difference of survey method to response rate opinions of non-respondents	Attributes of non-respondents and the situation of refusal of interview surveys are investigated. Opinions of non-respondents are captured with follow-up by visiting repeatedly.	Difference of the response rate caused by age was significant. There were also differences of opinions between respondents and non-respondents who converted to respondents by follow-up. The non-respondents’ consciousness tended to be pessimistic and more depressed than the average of all the samples.
Yanai, M. 1986	voting behavior at elections	difference of true voting rate and survey data attributes why takers cannot reach targets.	The character of non-respondents to the survey of voting behaviors and abstainers from voting is analyzed, using the survey data and actual election data.	People who go to vote tend to respond to the survey: voter turnout obtained by the survey was higher than actual turnout. High daily mobility causes both non-response and abstention from the vote.
Goyder, J. 1987	Use of computer in universal life	use of computer attributes involvement with use of computer and organizations	Using data of a survey about use of computer, relationship between response behavior and individual involvement with the survey topic is investigated.	Not only demographic attributes influence the response behavior but also involvement with the survey topics affects motivation to respond. The second important factor to response behavior is involvement with the organization related to the survey.
Triplett, T. et al. 1996	daily activities	attributes the number of skipped items and “don’t know”	Follow-up survey is conducted toward non-respondents to a telephone daily activity survey.	Data from converted refusals have higher mean items of non-response and “don’t know.” Attributes of gender, area, size of family, and the number of children do not affect response rate.
Saitama Uni. Policy study group, 2002	Prefectural administration	attributes why takers cannot reach targets opinions of non-respondents	Non-respondents to a mail attitude survey are followed-up by visiting.	Average age of respondents to the follow-up survey is lower. Respondents to the follow-up survey have lower interest in prefectural administration. However, there is no difference about expectation for the administration.
Tsuchiya, H., 2005	Nationality of Japanese	reason for cooperation attributes	A follow-up survey is made to respondents to a survey on the Japanese National Character.	The non-respondents to the follow-up tend to be indifferent to society and their answers include more “do not know” than those of the respondents to the follow-up.

SURVEYS OF DIFFERENT TOPICS

Description of Questionnaire Surveys

As mentioned above, surveys on neighbourhood traffic problems, noise problems, and social security and health issues were conducted for this study. In the following part, each survey is called “traffic survey”, “noise survey”, or “social security survey”. All these surveys asked residents how they perceived problems related to each topic.

The surveys were conducted in the Yono area, Saitama, Japan, which is about 1 square kilometre in size, having 5,414 households (2008) (Figure 1). In Yono, large numbers of cars heading to the city centre run through the narrow roads to avoid congestion on arterial roads surrounding the subject area. This through-traffic threatens pedestrians and cyclists, and some traffic accidents have occurred in the area.

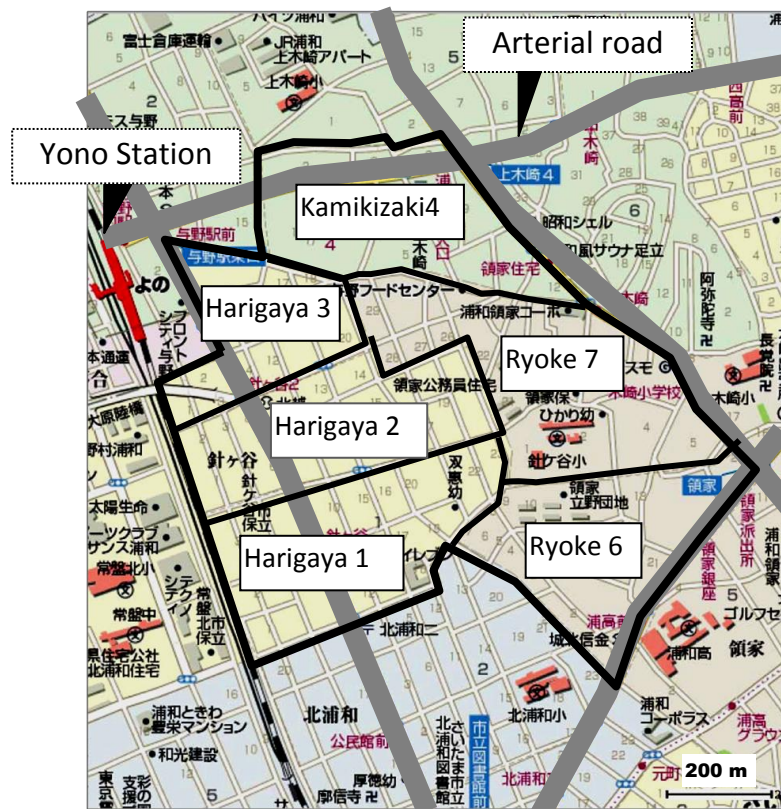


Figure 1 - Subject area

The target of the questionnaire surveys were heads of households that were randomly sampled using a house map. For every topic, around 20% of households were randomly selected. One head of household were distributed a questionnaire about one topic. Although three kinds of the questionnaires were distributed to different households, we suppose populations of the three surveys are the same, because the questionnaires were distributed geographically evenly. The reason why the target was heads of households is to specify the respondents to the surveys by using the house map.

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The questionnaire was distributed by having it dropped into each mailbox by laboratory students and it was collected by mail using a postage free envelope. The date was May 17th, 2008. After the time limit of the collection, we conducted a follow-up survey for people who did not respond in order to capture the silent group. The date was June 10th, 2008. The distribution and collection method was same as the first time. Table 3 shows distribution and collection of the surveys.

Table 3 - Distribution and Collection of Three Surveys

Topic	Initial survey Date: 2008/5/17 (Sat) Time limit of answer: 2008/5/30 (Fri)			Follow-up survey Date: 2008/6/10 (Tue) Time limit of answer: 2008/6/23 (Mon)			
	Distribution	Response	Response rate	Response after follow-up	Response rate of follow-up	Final response	Final response rate
Traffic	949	233	24.6%	77	10.8%	310	32.7%
Noise	872	177	20.3%	72	10.4%	249	28.6%
Social security	891	208	23.3%	55	8.1%	263	29.5%

Validation of Population of Each Questionnaire Survey

Before starting analysis we checked attributes of the respondents of the three questionnaire surveys, in order to validate the above supposition that the population of each survey is same. The attributes checked here are age and occupation.

Figure 2 shows the age distribution of the respondents of each survey. On all three surveys, the percentage of respondents in their thirties or over is over 90%, and over 50% of the respondents are people in their fifties or over. Regarding the age distribution, there is not so much of a difference among the three surveys, except the rate of respondents in their sixties is somewhat higher in the social security survey than other two surveys. Figure 3 shows respondents' occupation. The percentage of "company employee" is the highest in all surveys. In addition, proportions of other occupations are not so different among the three surveys. In social security survey, the rate of "company employee" is somewhat lower and that of "inoccupation" is somewhat higher than others. It seems that the topic of social security influenced the result. From these results we suppose that the difference of age and occupation distribution among these surveys is insignificant and it does not influence the following analysis comparing the three surveys.

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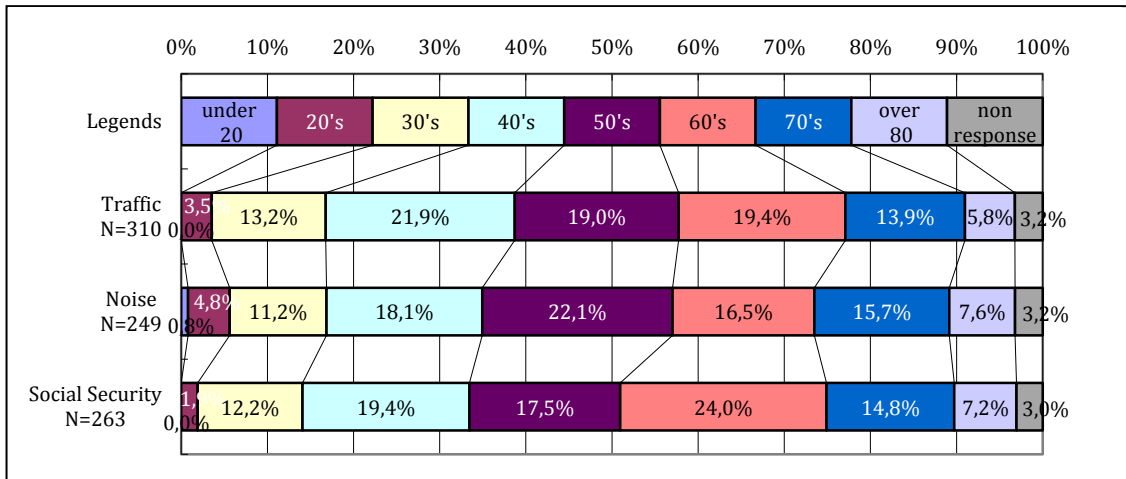


Figure 2 - Age distribution

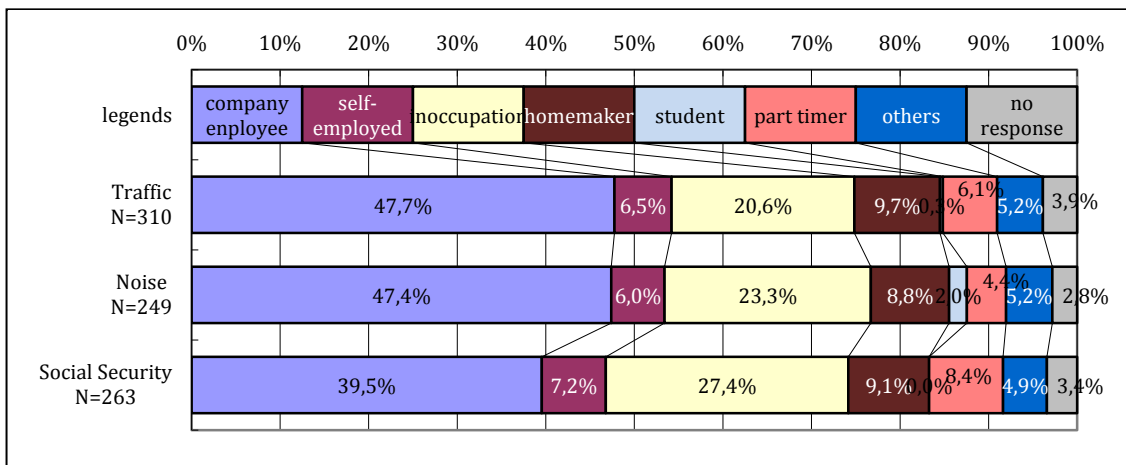


Figure 3 - Occupation distribution

CHARACTERISTICS OF NEIGHBOURHOOD TRAFFIC PROBLEMS

This section analyzes relationships between resident consciousness and the character of neighbourhood traffic problems, which is the limited impact of neighbourhood traffic problems. To reveal the relationships, we examine the following three hypotheses. The first is that *it is difficult that residents share concerns about neighbourhood traffic problems*. The second is that each resident's consciousness about neighbourhood traffic problems depends on their own behavioural patterns, not only places of their houses. The third is that *residents who recognize traffic problems far from their houses tend to think their thought is not shared in the local communities*. If these hypotheses are true, it may be said that concerns about neighbourhood traffic problems tend to differ among residents; that encourages residents become the silent group in processes of transportation projects because the situation where a resident's opinion is different from people around him/her may put the resident in a

situation of the “spiral of silence”. After these hypotheses are tested, the effect of character of neighbourhood traffic problems on the silent group is examined in the next chapter.

How Residents Think Whether Their Awareness of Concerns Are Shared

This section tests the first hypothesis, “*it is difficult that residents share concerns about neighbourhood traffic problems*”. Figure 4 shows answers to a question about how respondents think their concerns are shared in the neighbourhood; items in parenthesis are options shown in the social security survey. The target of the analysis is respondents who answered they have awareness of the problems on each survey topic: 81.0% of respondents to the traffic survey, 23.7% of respondents to the noise survey, and 71.9% of respondents to the social security survey. In the traffic survey, “people who walk through the dangerous place would have the same awareness” answer represents the highest rate, 38.2%. In the noise survey, “neighbours have the same awareness” answer represents the highest rate, 59.3%. In the social security survey, “residents my age have the same awareness” answer represents the highest rate, 43.9%. In the traffic survey, the proportion of “neighbours have the same awareness” answer is only 29.1%; the value is significantly smaller than that of the noise survey, 59.3%. The result suggests that many people do not think their neighbours perceive traffic problems as they do; it supports the hypothesis. Regarding social security issue, it seems that people think their concerns are shared depend on age rather than in the whole neighbourhood; it would be a characteristic of issues not limited in time or space.

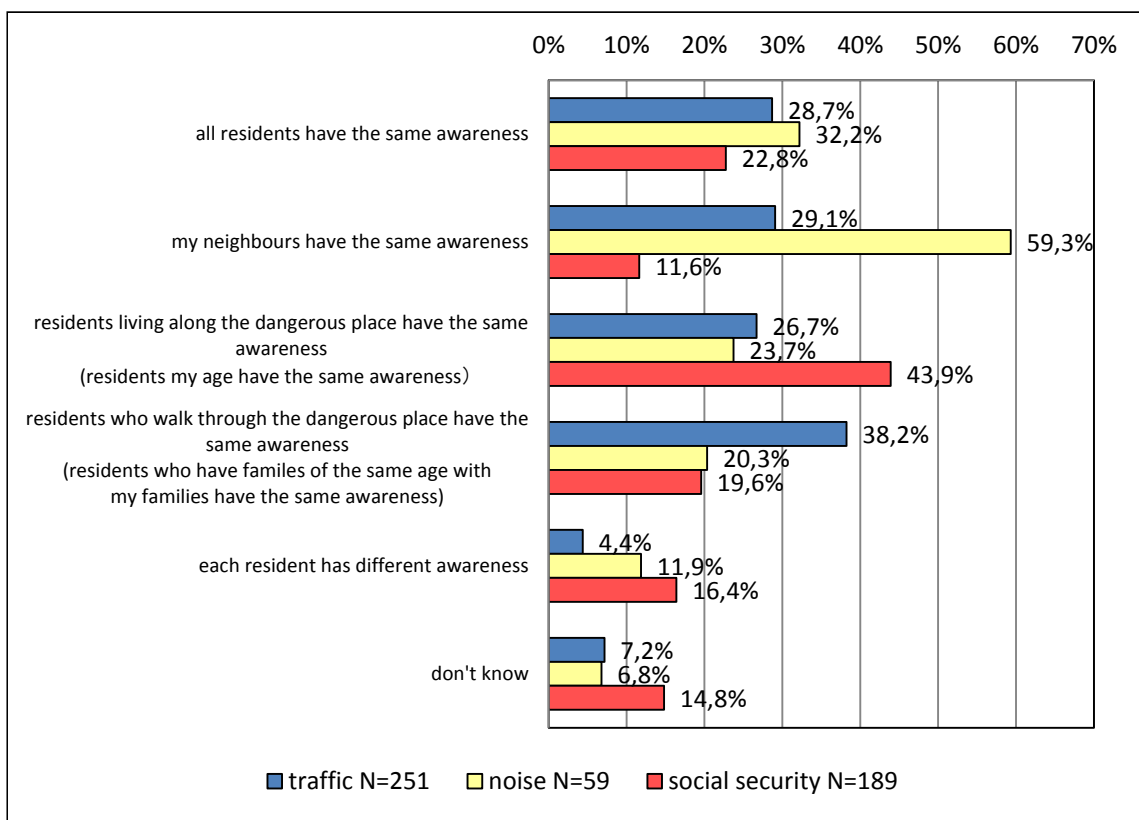


Figure 4 – How respondents think their concerns are shared in the neighbourhood

Relationship between Awareness of Concerns and Locations Where Problems Occur

In this part, the second hypothesis, “each resident’s consciousness about neighbourhood traffic problems depends on their own behavioural patterns, not only places of their houses”, is tested. Responses to the traffic survey and the noise survey are compared.

We analyzed relationship between locations where respondents perceive problems, and locations of their houses and their behavioural patterns. The questionnaires of the traffic survey and noise survey showed respondents a map of the subject area, which is respondents’ neighbourhood, and asked them to show places where they perceive problems, the location of their house, and routes that they often use on foot or by bicycle. From answers to the question we classified locations where respondents perceive problems into two categories; one is “around the respondent’s house” and the other is “on a respondent’s regular route used on foot or by bicycle”. Figure 5 shows the proportions of respondents who perceive problems in these locations in the traffic survey and the noise survey. In the traffic survey, 29.2% of the respondents perceive problems around their house, and 87.1% perceived problems on a route they often use on foot or by bicycle; the rate of the latter is significantly higher than that of the former at the level of 5%. In the noise survey, 67.2% of the respondents perceive problems around their house and 30.3% of the respondents perceive problems on a route they often use on foot or by bicycle; in contrast to the traffic survey, the rate of respondents who are aware of problems around their house is significantly higher than that of the others at the level of 5%. According to the result, residents concern traffic problems more on their daily routes than around their houses; the trend is different to noise problems. It fits the second hypothesis.

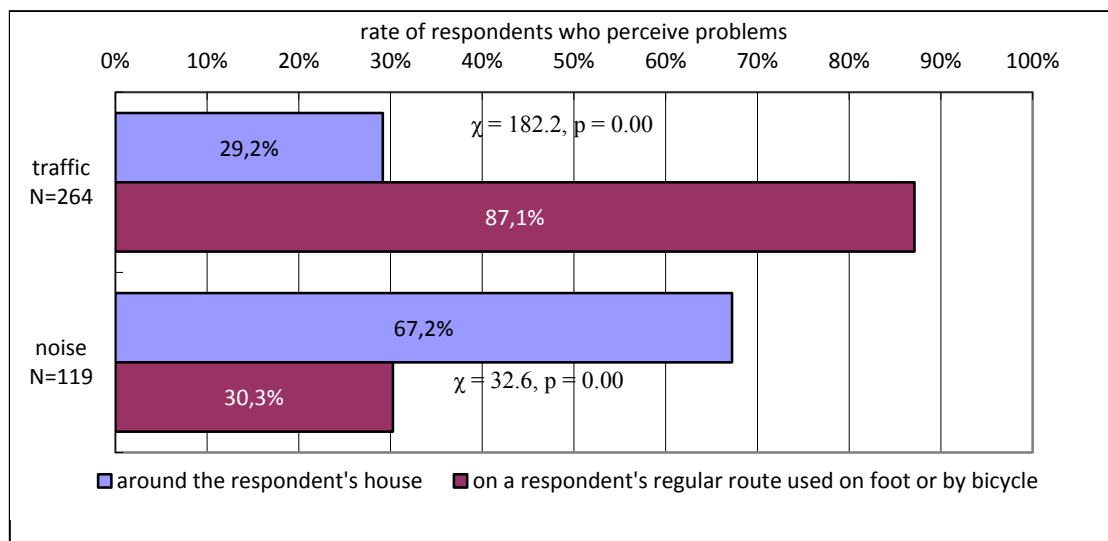


Figure 5 - Location where respondents perceive problems

As an additional analysis, we examined the relationship between respondents’ sense of danger and location where they perceive problems. In order to verify the relationship, we made a logistic regression analysis. The dependent variable is “the level of sense of danger

in the neighbourhood”; the value of the variable varies according to the respondents answer to the question; “regarding traffic safety, how much do you feel danger when you walk or cycle on residential roads in the area of the map?” as Table 4 shows. The proportion of respondents who chose option “1) strongly feel a sense of danger” and “2) somewhat feel a sense of danger” is over 90%, so this time we divide respondents feeling serious danger, who chose option 1., from others for the analysis.

Table 4 - Value of the dependent variable

Answer to the question of “regarding traffic safety, how much do you feel danger when you walk or cycle on residential roads in the area of the map?”	Value of the dependent variable
1) strongly feel a sense of danger	1
2) somewhat feel a sense of danger	0
3) cannot judge	0
4) somewhat feel safe	0
5) have not felt a sense of danger	0
6) don't know	0

In addition to the relationship between locations where respondents perceive problems and their daily living area, we supposed that three more factors affect the level of sense of danger: “types of dangerous situations respondents concern”, “respondents’ age”, and “age of families”. The followings are the variables related to these factors. We set dependent variables to describe these factors according to answers to the survey. Two variables represent the relationship between locations where respondents perceive problems and their daily living area. These are “perceive problems around the house (x_1)” and “perceive problems on a regular route (x_2)”; they are dummy variables and the values are 1 when it is true for the respondent. Four variables represent what types of dangerous situations respondents concern. These are “high traffic volume(x_3)”, “speeding cars(x_4)”, “narrow street (x_5)”, “large vehicles(x_6)”; they are dummy variables and the values are 1 when the respondent answers he/ her concerns these matters. The variable of “age (x_7)” varies from 25 to 85 in increments of 10; when the respondent is in his/her 20’s, the value is 25. Two variables represent age of respondents’ families; “have elementary-age kid(s) (x_8)” and “have middle school-age kid(s) (x_9)” are dummy variables and their values are 1 when the respondent has any children in those ages. Table 5 shows the result of the logistic regression analysis. We used NLOGIT 3.0 for the calculation. Regarding Model 1, which includes above all variables, significant variables at the level of 5% are “perceive problems around the house (x_1)”, “high traffic volume(x_3)”, “speeding cars(x_4)”, “narrow street (x_5)”, “age (x_7)”, “have elementary-age kid(s) (x_8)”. Model 2 is made up of only these significant variables in Model 1; all of them are also significant in Model 2.

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Table 5 - Logistic regression analysis on sense of danger regarding traffic problems

		Model 1			Model 2		
		B	t-value	P-value	B	t-value	P-value
Constant		-5.97	-5.73	0.000**	-5.88	-5.74	0.000**
Where the respondent perceive problems	x ₁ : around house (Yes: 1)	0.451	1.37	0.171			
	x ₂ : on a regular route (Yes: 1)	1.27	2.00	0.046*	1.31	2.07	0.038*
Topics of concern	x ₃ : high traffic volume (Yes: 1)	1.02	3.04	0.002**	0.997	3.05	0.002**
	x ₄ : speeding (Yes: 1)	0.691	2.11	0.035*	0.708	2.21	0.027*
	x ₅ : narrow street (Yes: 1)	0.732	2.13	0.033*	0.692	2.05	0.040*
	x ₆ : large vehicles (Yes: 1)	-0.116	-0.324	0.746			
Age	x ₇ : age (20's: 25,...,over 80: 85)	0.038	3.14	0.002**	0.037	3.16	0.002**
Family	x ₈ : have elementary-age kid(s) (Yes: 1)	0.853	2.04	0.041*	0.835	2.02	0.043*
	x ₉ : have middle school-aged kid(s) (Yes: 1)	-0.564	-0.98	0.326			
Number of Sample, n		289			289		
-2LL		257.6			260.4		
McFadden R ²		0.15			0.14		
Omnibus test (χ^2 , df, sig.)		45.5, 9, 0.000			42.7, 6, 0.000		
Hosmer - Lemeshow test, (χ^2 , df, sig.)		2.868, 8, 0.942			4.028, 8, 0.855		
Hit ratio		78.2%			77.5%		

P*** < 0.01, P* < 0.05

Regarding the factor of the relationship between locations where respondents perceive problems and their daily living area, one sees that “perceive problems around the house (x₁)” is not a significant variable but “perceive problems on a regular route (x₂)” is significant and has the positive coefficient. The result indicates that respondents who are aware of problems on their daily routes not only around their house tend to have strong sense of danger about traffic safety. “High traffic volume(x₃)”, “speeding cars(x₄)”, and “narrow street (x₅)” have positive coefficients; the result indicates respondents who concern about these matters tend to think the traffic situation is very serious. The positive coefficient of “age (x₇)” suggests that the older respondents are, the more serious they think traffic problems. From the result that “have elementary-age kid(s) (x₈)” is significant and has the positive coefficient, and “have junior school-age kid(s) (x₉)” is insignificant, it is suggested that having younger children affects a strong sense of danger.

Perception about Sharing Concerns and Location Where Problems Are Perceived

This part examines the third hypothesis that *residents who recognize traffic problems far from their houses tend to think their thought is not shared in the local communities*. Respondents who are aware of traffic problems were divided into two types; one type of respondents concern problems around their houses, and the other type of respondents concern only problems existing not around their houses. Figure 6 shows the comparison between the two types of respondents about perception of how their concerns are shared in their community. In case of the respondents who concern problems around their house, 40.0% of them think “neighbours have the same awareness”. On the other hand, in the group of respondents who do not concern only problems occurring around their house, 22.6% of

them think “neighbours have the same awareness”. There is a significant difference between the two groups. The result supports the third hypothesis. The result and a former finding, that is, people are aware of neighbourhood traffic problems rather on their daily routes than around their house, suggest that neighbourhood traffic problems are perceived far from individuals’ houses so many people do not feel their concerns are shared with neighbours.

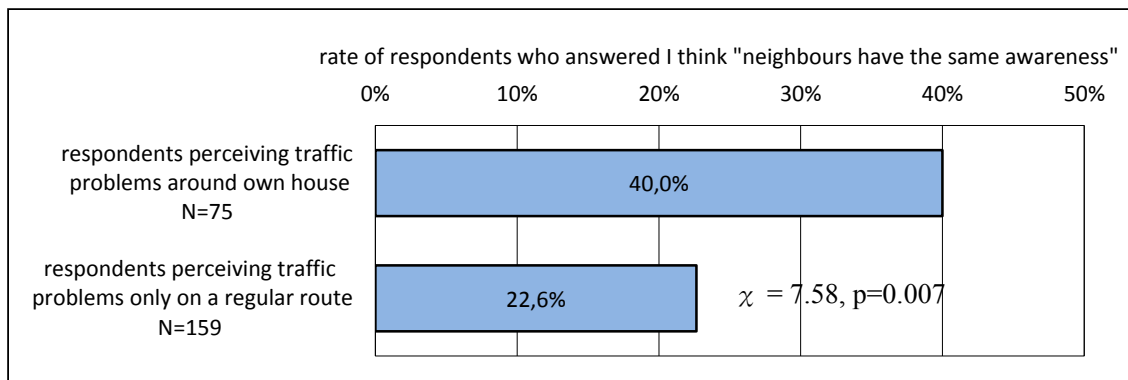


Figure 6 - Different perception about sharing concerns depending on problem recognition place

Summary of Analysis about Character of Neighbourhood Traffic Problems

So far, we have tested three hypotheses about neighbourhood traffic problems. The first is that *it is difficult that residents share concerns about neighbourhood traffic problems*. A comparative analysis showed that residents who concern traffic problems tend to think their concerns are not shared with their neighbours; it supports the first hypothesis. The second hypothesis is that *each resident’s consciousness about neighbourhood traffic problems depends on their own behavioural patterns, not only places of their houses*. Two findings support the hypothesis; first, more residents perceive traffic problems on their regular route than around their houses; second, serious sense of danger is affected by problems existing on residents regular route not only around their house. The third hypothesis is that *residents who perceive traffic problems far from their houses tend to think their thought is not shared in the local communities*. The fact that residents who perceive traffic problems only on their regular route tend to think their neighbours do not have the same awareness supports the hypothesis.

From these result, it is suggested that neighbourhood traffic problems have the character of being often perceived far from one’s house, so it is difficult for residents to share concerns with their neighbours. Such a character seems to isolate each resident and encourage the “spiral of silence” in processes of neighbourhood traffic projects. That is, difficulty of sharing common awareness may tend to make a resident think his/her opinion is that of the minority in the community, and then the resident would tend to hesitate to state his/her opinion.

CHARACTER OF NEIGHBOURHOOD TRAFFIC PROBLEMS AND THE SILENT GROUP

As described above, we found that neighbourhood traffic problems have a character that makes people tend to think their concerns about traffic problems are not shared with their neighbours. The previous studies we reviewed suggest that a situation where others have different opinions makes an individual bear burden, which is social cost, and make him/her being the silent group in the “spiral of silence”. In this chapter, we examine whether the silent group is affected the character of neighbourhood traffic problems. The thought of the silent group in the traffic survey is analysed by comparing respondents who answered to the follow-up survey and respondents who answered before the follow-up survey. As mentioned in the first chapter, we suppose the respondents who answered the follow-up survey as part of the silent group.

There are a number of stages which include resident participation in the process of neighbourhood transportation projects. This time, the main theme of the traffic survey that residents were informed is to find what problems suffer residents in the neighbourhood; such surveys would be conducted at initial stages to sort out problems involved. Therefore, it is possibly to say that the silent group in this survey is positioned as the silent group in the beginning stage for problem finding in processes of transportation projects.

Attributes of the Silent Group and Non-silent Group

Figure 7 shows the age distributions of the silent group and the non silent group. Regarding the silent group, the rate of respondents in their 60’s is 11.7%; this value is significantly smaller than that of the non silent group, 21.9%, at the level of 5%. This result implies that people in their 60’s tend to become the non silent group. Regarding the relationship between age and abstention, Kabashima (1997) has found that voting rates in national elections increase with age by 60’s and it decrease in 70’s.

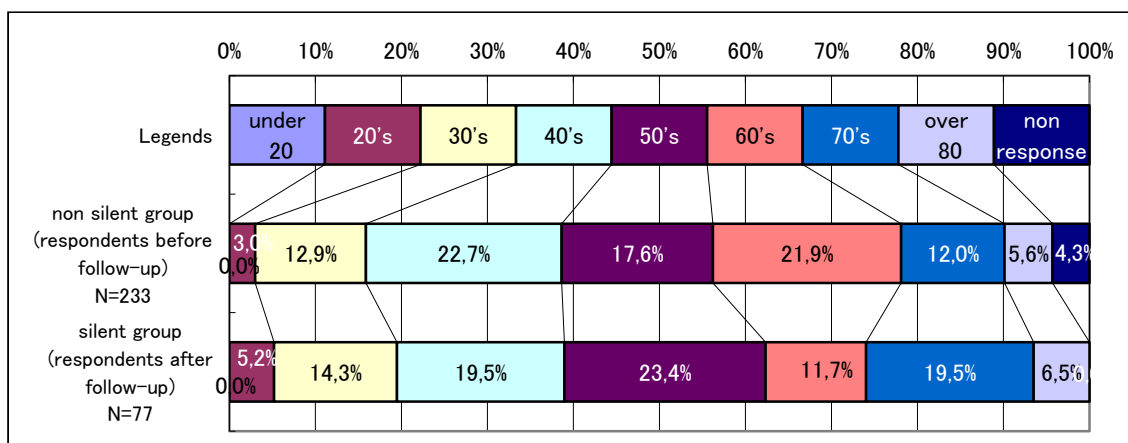


Figure 7 – Age of silent group and non silent group

Figure 8 shows occupations of the silent group and the non silent group. The rates of “inoccupation” and “homemaker” in the silent group seem to be higher than that of the non silent group, however, there is no significant difference between the two groups.

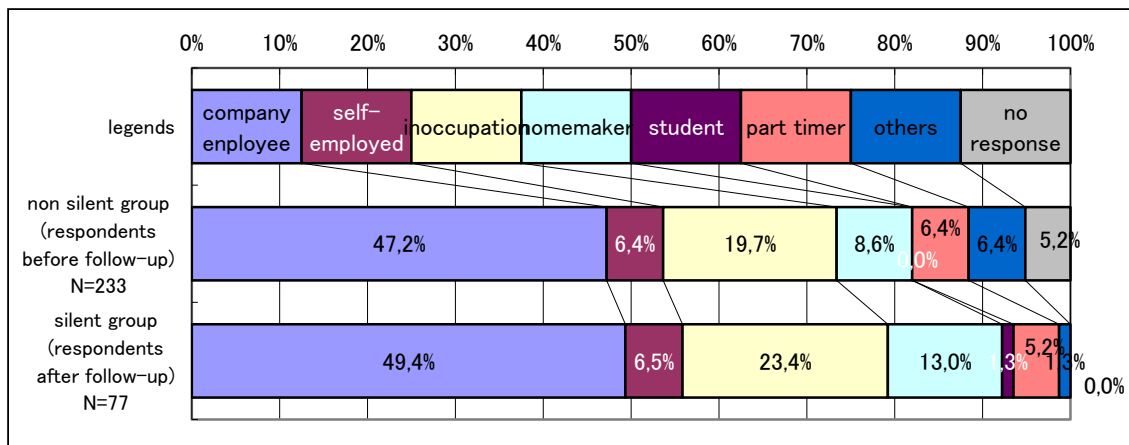


Figure 8 – Occupation of silent group and non silent group

Effect of Character of Neighbourhood Traffic Problems on the Silent Group

In this part we check whether the silent group are influenced by the above mentioned characters of neighbourhood traffic problems that seem to be related to difficulty of sharing concerns. Specifically, the effects of the location of perceived problems and perception of other residents’ concerns are focused. On that view point, we verify following three hypotheses; the first is “*the silent group do not think their concerns about neighbourhood traffic problems is shared with other residents*”; the second is “*the silent group concern neighbourhood problem occurring far from their house*”; and the third is “*the silent group do not think their concerns are shared, even if they concern problems around their house*”.

First, we test the hypothesis of “*the silent group do not think their concerns about neighbourhood traffic problems are shared with other residents*”. Figure 9 shows the silent group and the non silent group’s answers to the question about how respondents think their concerns are shared in the neighbourhood. In the non silent group 26.3% of the respondents answered “my neighbours have the same awareness”, and in the silent group 38.6% of the respondents answered so; both of them are less than 40% and there is no significant difference between them. Regarding other items, significant differences are not found between the silent group and non silent group. The result does not explain the silent group tend to think their concerns are not shared than the non silent group, so it does not support the hypothesis.

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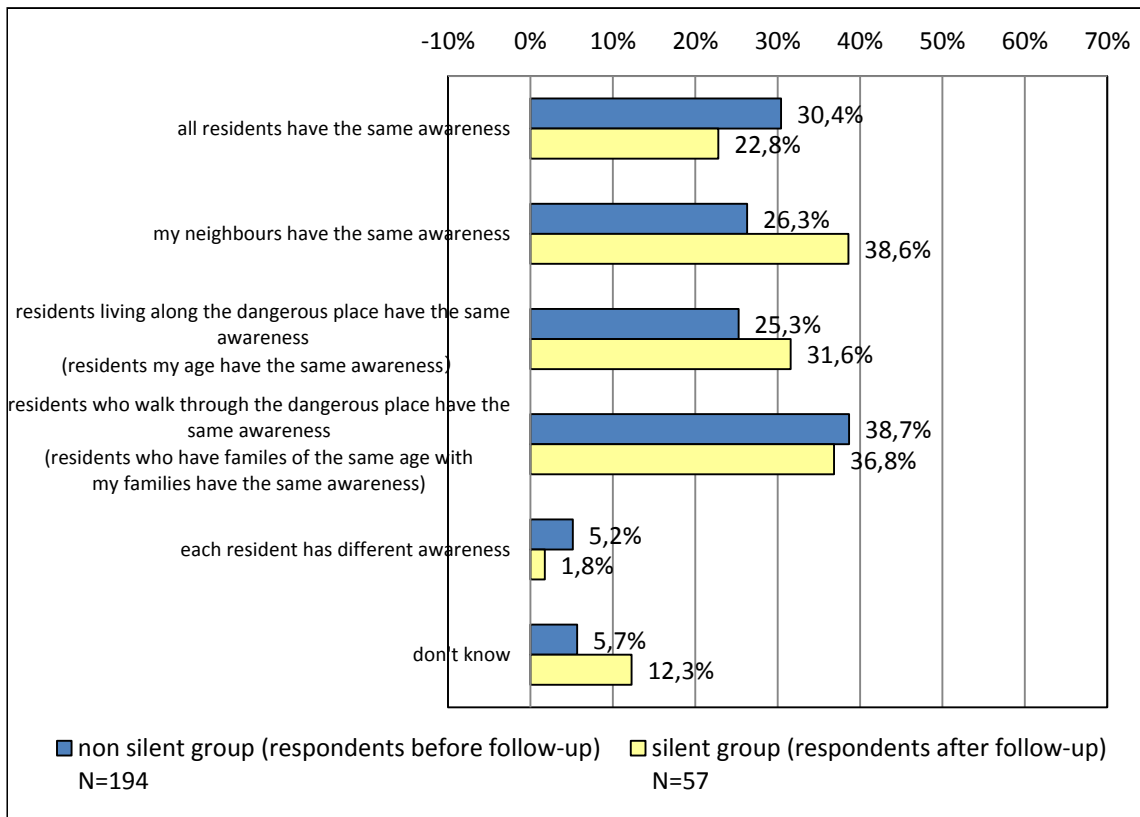


Figure 9 – How the silent group think their concerns are shared in the neighbourhood

Secondly the hypothesis of “*the silent group concern neighbourhood problem occurring far from their house*” is tested. Figure 10 shows where the silent group and non silent group perceive traffic problems. In both groups, around 30% of the respondents perceive problems around their house and over 80% of the respondents perceive problems on their regular route used on foot or by bicycle. Regarding the result, there is no significant difference between the silent group and non silent group; it does not support the hypothesis.

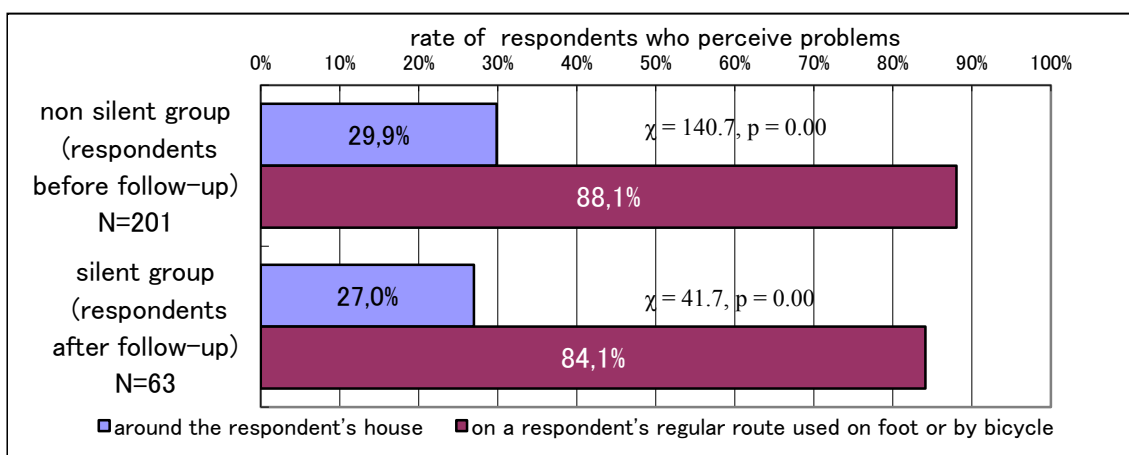


Figure 10 - Location where the silent group and non silent group perceive problems

Thirdly the hypothesis of “the silent group do not think their concerns are shared, even if they concern problems around their house” is examined. Figure 11 shows a comparison between the two types of respondents in the silent group and non silent group: respondents who perceive traffic problems around their house and who perceive traffic problems only on their regular route, about perception of how their concerns are shared with their neighbours. In both the groups, it is found that respondents who perceive problems around their house tend to think their neighbours have the same awareness than respondents who perceive problems only on their regular route; both of them show the same trend. From the result, the hypothesis that “the silent group do not think their concerns are shared, even if they concern problems around their house” is not supported.

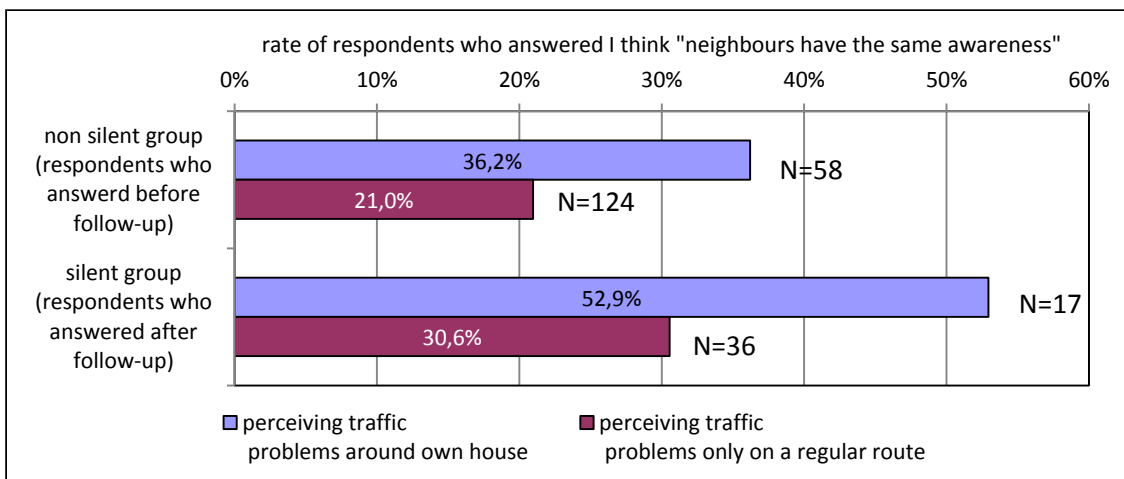


Figure 11 – Silent group and non silent group's perception of sharing concerns divided by locations where they perceive traffic problems

Through the process of verifying the three hypotheses, it was not found that response behaviour was influenced by the character of neighbourhood traffic problems that may cause difficulty of sharing concerns about traffic problems. The result suggests that the neighbourhood traffic problems' character is in no position to encourage people to become silent at problem finding stages of transportation projects. However, there could be other factors behind the existence of the silent group in the traffic survey, and it could give bias to the survey result. Therefore, in the next part an analysis is conducted on a different view point to get some knowledge about the silent group at the problem finding stage.

Difference between the Silent Group and Non Silent Group

In order to examine whether there are difference between the silent group and non silent group, this time we focused on respondents' awareness on neighbourhood traffic problems. We supposed that levels of awareness on the traffic circumstance could influence response behaviour when respondents are asked to explain their recognition of neighbourhood traffic problems. Figure 12 shows answers of the silent group and non silent group for the question; “regarding traffic safety, how much do you feel danger when you walk or cycle on residential roads in the area of the map?” In non silent group, 24.3% of the respondents answered they “strongly feel a sense of danger” and 63.1% of the respondents answered they “somewhat

feel a sense of danger”; the total of respondents who feel a sense of danger is 87.4%. On the other hand, in the silent group, 17.3% of the respondents answered they “strongly feel a sense of danger” and 58.7% of the respondents answered they “somewhat feel a sense of danger”; the total of respondents who feel a sense of danger is 76.0%. The rate of respondents who feel some sense of danger in the silent group is significantly higher than in the non silent group at the level of 5% ($\chi = 5.55, p = 0.02$).

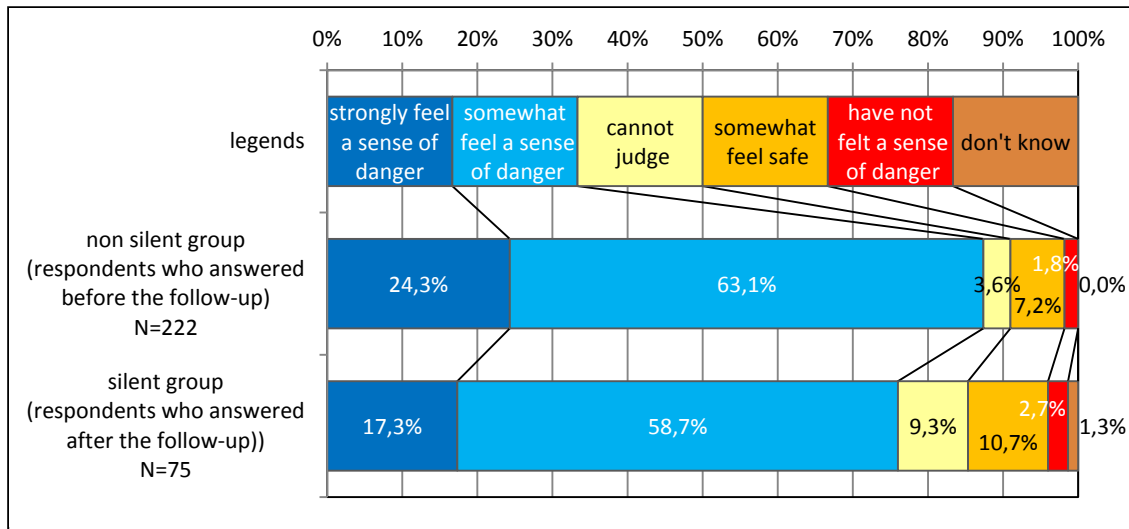


Figure 12 – Silent group and non silent group’s sense of danger in the neighbourhood

The result suggests that different awareness on problems influences behaviour of silence at the problem finding stage of transportation projects; that is, residents who think their neighbourhood is dangerous tend to respond to surveys and residents who do not think it is dangerous tend to be silent. Those who are silent and not suffered from traffic problems could be affected by future transportation planning, so they should be consulted appropriately in the planning process.

CONCLUSION

In this study, we examined the character of neighbourhood traffic problems which may relate to the existence of the silent group. In conclusion, we found that awareness of neighbourhood traffic problems is hard to share for residents. Furthermore, it was found that the difficulty is related to the complicated extension of locations where residents perceive traffic problems; residents perceive traffic problems not only around their houses but also on their regular route. That character of neighbourhood traffic problems seems to have a possibility of enhancing the existence of the “spiral of silence” because the character may create more situations where a resident faces other residents who have different opinions about neighbourhood traffic problems. Regarding the problem finding stage of neighbourhood transportation projects, it was suggested the character of neighbourhood traffic problems that makes sharing concerns does not influence the existence of the silent group but the level of awareness about traffic problems relates to the behaviour of silence.

Considering that traffic problems and actions for those problems could have different extent of impact, the silent group at the initial stage for problem finding should be dealt with appropriately in the whole process of transportation projects. In addition, although the “spiral of silence” was not found at the problem finding stage, after passing through the stage there are many stages in the process of neighbourhood transportation projects, which often create conflicts among residents. Therefore, it should be a future challenge to verify whether the “spiral of silence” exist at several stages in resident participation processes of transportation planning.

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