

**ROADS AS NEW COMMON POOL RESOURCES,
SPEED REDUCTION AS A PUBLIC GOOD -
2 CASE STUDIES IN ORGANIZING LARGE-SCALE COLLECTIVE ACTION**

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ABSTRACT

Two case studies with many actors attempted to create favorable conditions for collective action through providing external organizational impetus and implementing novel action instruments.

In study 1, the task was to reduce, during a special action week, morning and evening traffic congestion that regularly formed at a highway tunnel near Zuerich. Traffic back-ups result from local and temporal over-use of the common pool resource "traffic space". We attempted by means of a publicity campaign and public collection of signed statements of self-commitment from a core group of about 18,000 regular commuters to establish a kind of rotation system in avoiding travel at peak traffic times. This aimed to reduce the peak load and congestion. In spite of great media efforts, the widely dispersed target group could not be mobilized sufficiently. Compared to the baseline week, the total reduction of traffic back-up amounted to 10%, or two hours respectively. Per peak hour, 100 cars traveled at other, less busy times. We had aimed at a minimum goal of a reduction of 400 cars per hour. However, the study demonstrated that the contributions discussed were in fact effective and that the statistical leveling – regular distribution of the uncoordinated contributions to reduce traffic during the periods of heavy traffic – functioned reliably. The publicity and public acceptance of this campaign based on voluntary contributions were large in scale.

In study 2, we aimed to reduce neighborhood driving speeds in a district of 10,000 residents. The goal was to stimulate enough cooperative behavior in the 4,000 registered car owners to clearly reduce average driving speeds. The reduced speed was the public good. The intervention succeeded in mobilizing a large group of drivers. A thousand drivers voluntarily committed themselves in writing to reduce driving speed during the four months of the experimental phase, and the measured average speed reduction was remarkable. The reduction in driving speed was comparable to that achieved elsewhere through compulsory, top-down measures, laws, and police control.

INTRODUCTION

This paper aims to explore the prospects for and obstacles to the organization of large-scale collective action. There is considerable consensus today about the features of a resource and the appropriators that are conducive to an increased likelihood for successful engagement in collective action (Gibson, Ostrom & Ahn, 1998: 61). Yet it is important to note that the empirical evidence on which this is based stems in the main from smaller scale settings. The challenge is to investigate and understand cooperation, or its failure, in settings with a large number of actors. Many theorists agree with Olson (1965) that there is a negative relationship between group size and solving of collective action problems. Game theory results appear to confirm this (for an overview, see Baland & Platteau, 1996). On the other hand, some empirical findings (see Gibson, Ostrom & Ahn, 1998: 67) show that group size does not have only negative effects on the probability that collective resources will be provided. Another difficulty for analysis lies in the fact that as soon as very many actors are observed, numerous changes in other additional variables result.

Today there is a multitude of problems of local or temporal overuse of traditional and new common pool resources (CPR), and there are also difficulties associated with the provision of public goods. Solutions to problems in these areas require collective action. For reasons mentioned above, however, the probability of spontaneous self-organization is rather low. We

thus turned our attention to the central question of whether advantageous conditions for successful collective action can be created through providing external organizational impetus and intervention and through implementing novel social-psychological action instruments.

Diffusion and Intervention Instruments

In organizing collective action it makes sense to distinguish two aspects of the problem: 1. how to encourage an individual to cooperate by means of an effective psychological mechanism (intervention problem) and 2. how to achieve cooperation among the greatest number of individuals by means of an effective social mechanism (diffusion problem). These two aspects cannot always be separated ideally. To solve the first problem, there exist many field-tested intervention instruments (Dwyer, Leeming, Cobern, Porter & Jackson, 1993; Fisher, Bell & Baum, 1984; Gifford, 1987). There are also empirical findings – albeit fewer – pertinent to the problem of diffusion (Borden, 1984; Darley & Beniger, 1981; Darley, 1978).

The two case studies are reported here in order to communicate the experience we gained in our attempt to stimulate and foster collective action through active interventions. Of particular interest is *public self-commitment in writing*, an intervention instrument that has proven effective in small, experimental settings (Mosler, 1995; Mosler & Gutscher, 1996). We aimed to test and further develop this instrument for implementation in large collectives.

Case Studies

In *study 1*, the task was to reduce, during a special action week, traffic congestion that formed regularly every morning and evening at a highway tunnel near Zuerich. Traffic back-ups result from local and temporal overuse of the common pool resource (CPR) "traffic space". Even though the overused resource "traffic space" regenerates daily, the accompanying effects in the form of traffic jams are linked to considerable psychological stress and aggression in drivers, an increase in accidents, problematic overloading of alternate routes in the street network that are not meant to carry high volumes of traffic, higher local emission rates, and excessive economic costs in the form of unproductive work down-times. We view traffic back-ups as a combination of time-dependent provision problems (Ostrom, Gardner & Walker, 1994) where we face problems on the demand side and on the supply side simultaneously. Alternatively "open road", or "free-flowing traffic" can be seen as a public good, whose subtractability is not zero however, but rather lies in a median area. The provision problem is shared by both aspects.

The traffic bottleneck is mainly an open access problem. Traffic studies revealed, however, that more than two thirds of the commuters come from the more narrowly defined area of the canton of Aargau. Although the campaign addressed all users of the road and some of the diffusion activities extended far beyond the Aargau area, the focus of the public information campaign lay on the canton of Aargau. Projections based on our own video filming and traffic counts yielded a core target group of about 18,000 persons, who were addressed (with the exception of information along the congested area) not individually, but rather only through the mass media.

The goal was to stimulate cooperative action in the form of a kind of "rotation system" among the 18,000 regular commuters during an experimental week. Through "taking turns" the aim was to unburden the tunnel at peak commuting times. As it was not possible to address commuters individually through direct communication, the propagated rotation system was based on uncoordinated, written announcements about contributing to an unburdening of the traffic.

Commuters read that "All it takes is for each regular commuter to avoid peak commuting times for one or two drives a week; through statistical leveling, drivers enjoy free-flowing traffic, or at

least shorter delays due to back-ups, on all of their other drives”. Looking towards the future, we thought to later turn the rotation system into a permanent system to use the resource sustainably, in that regular drives and occasional staggering of driving times and not driving could be announced via the Internet. In this way, traffic jams could be prevented or at least minimized.

The *diffusion instruments* in our campaign were press conferences, a “traffic jam” newsletter distributed to drivers at highway entrances and at highway rest stops, radio and television commercials, posters, feedback on the road in the form of current counts of the number of participants, a telephone hotline, and a web site with several web cameras along critical stretches of the road (www.baregg.ch). Up to date numbers of traffic participants was also communicated at the web site in real time. Further, we enlisted the help of important companies, public transportation providers, a car sharing organization, and a carpooling organization, which all gave public support to our information campaign.

The main *intervention instrument* consisted of public self-commitments, in writing, that were available through newspaper advertisements and the Internet. To support diffusion and as a reminder during the experimental week, drivers were also encouraged to display their participation in the form of bumper stickers on their vehicles. In order to increase and make salient the options in a field of highly automatic decisions to drive, the information campaign placed major stress on publicizing possible alternatives and the temporal characteristics of the traffic jams. The local department of construction that oversaw the critical stretch of roadways presented the campaign to the public. A team made up of a traffic engineer, a social psychologist, and a communications expert directed the campaign.

Study 2 addressed the problem of excessive driving speeds in the neighborhoods of a community of 10,000 residents. A reduction of neighborhood driving speeds improves pedestrian safety, increases the viability of the bicycle as an alternative means of transportation in neighborhoods, reduces noise pollution, and generally improves the quality of life. The reduced driving speed aimed for can be viewed as a public good, at everyone’s unlimited disposal. The goal was to stimulate enough cooperative behavior in the 4,000 registered car owners to clearly reduce average driving speeds. Cooperation consisted in a personal commitment, in writing, to maintain a neighborhood driving speed of 30 km per hour during the campaign phase of five months. The campaign was initiated by a team of social psychologists and implemented mainly by an action group and a group of coordinators. The community’s traffic commission made up the action group. Commission members acted as “multipliers”, that is, as “ambassadors” they elicited the participation of acquaintances and strangers in the action. Coordination tasks were taken over by the community’s department of construction. The main task was to make suggestions to the traffic commission on the form of the campaign and to put them into practice. The coordinators also collected the statements of self-commitment, lanced the campaign in the press, and conducted speed measurements during the campaign.

The *diffusion instruments* comprised press conferences, information booths, traffic commissioners as “ambassadors” propagating the action within their social spheres, a supporter club made up of businesses, local organizations, and political parties, dispensers for self-commitment forms positioned in local businesses, a feedback tower (“barometer of success”) at a central location, an advertising campaign, and posters.

The *intervention instrument* used was a written, public self-commitment. To reinforce the commitments made, reminders were also utilized. These were bumper stickers and key chains showing the campaign logo, posters with children’s drawings and 120 flags along the streets. We

also offered self-feedback in the form of an electronic measuring device that displayed the drivers' speeds on a large board at the side of the road.

In both projects, volunteers committed themselves in writing to the new measures. In study 1, the collection of statements took place over the Internet, or via phone, fax or letter sent back directly to us or to one of several regional radio or television broadcasters. In study 2, statements were collected mainly by a network of local persons and through the local campaign.

Psychological Determinants of Participation

Olson (1965) presumed that actors in a collective action situation are motivated solely by economic calculations. From this he concluded that it is not rational to participate voluntarily in collective action campaigns. According to this pessimistic assumption, public goods can only be set up through external compulsion. However, empirical findings contradict this assumption (Klandermans, 1984; Opp, 1985; Urban, 1990; White und Runge, 1995). The alternative explanatory approaches are found mainly in economic, political science, and sociological traditions of thought, while psychological approaches are still under-represented (for an overview, see Kelly & Breilinger, 1996; Tobias, 1999). Marwell and Oliver (1993) further developed Olson's economic approach in a theory of the critical mass. Important components of their model include the interests and resources as well as consideration of the production function of the public good. This allows for consideration of the use of a public good provided only partially. Macy (1990) worked out plausible simplifications and an initial attempt at testing the approach empirically. Granovetter (1978; Granovetter & Soong, 1983) contributed to the discussion with their ideas on subjective thresholds with regard to the number of persons already participating. Also important to our own approach is the work of Klandermans (1984), who in addition to the problem of influence by others also focused attention on the problem that under certain circumstances, people can feel that their own contributions to providing public goods are worthless. Self-efficacy, or the efficacy of the many aggregated to something we might call "collective efficacy", appears to be a central factor in the decision to participate, while the problem of free-riding, so strongly emphasized by Olson (1965), plays more of a subordinate role in the empirical studies (for example, Opp, 1985; Urban, 1990; White & Runge, 1995).

The present paper aims to discuss the types of diffusion and intervention instruments implemented in the two studies, the degree to which they were heeded by the public, and the things that turned out to be crucial to participation or non-participation. We will also show the effects that resulted from participation in the collective action we initiated regarding use of a common pool resource (study 1) and the provision of a public good (study 2).

METHOD

The following presents the instruments we used in collecting the data.

Instruments for collecting the data in study 1

- In preparation for the action campaign, we first examined the characteristics of the resource. What were the temporal regularities of weekday overuse of the resource "traffic space"? To find the answer, we evaluated police traffic reports over a longer period. A graphic representation of the findings was put in a traffic newsletter as well as on the Internet on the web page and distributed to the target public. The information showed that by driving at different times, travelers could avoid the most likely commuter traffic jams.

- A representative sample of 500 users of the route was interviewed (telephone interview) for the first time in June, 1998 about their subjective experience of the traffic backup, any strategies they used for adapting to or avoiding the congestion, and their willingness to make their own contribution to reducing traffic congestion. To form the sample, two video cameras recorded all license plate numbers of vehicles on the route during a backup at the tunnel. Trucks and cars clearly marked as company vehicles were left out of the sample. The Swiss Registry of Motor Vehicles provided names and addresses of the owners of the vehicles. A computer program located telephone numbers. The overall return rate in this sample was 56%.
- A part sample (n=167) of these users was interviewed in June, 1999 a second time, after the action campaign. Together with information from additional interviews with people who had taken part in the action week (n=76), the study sample analyzed was now made up of n=243 persons.
- Further, also available for analysis was the data from the total of N=1264 written self-commitments.
- In order to measure the effects, police registered traffic congestion on the relevant road. We also had data from permanently installed electronic vehicle counters.

Instruments for collecting the data in study 2

For the neighborhood speed reduction campaign, data was collected in several respects.

- Prior to the campaign, a questionnaire was sent to a representative sample of 1,500 residents between the ages of 18 and 65. The return rate for the questionnaire was 49%. The residents were asked about their attitude towards a speed limit of 30 km per hour, willingness to act, attitudes towards voluntary action campaigns, concern, and so on. The results yielded information relevant to how the campaign should be conducted.
- Following the campaign, the residents in the sample filled out a post-questionnaire. The return rate was 39%. Questions dealt mainly with the subjects' perceptions of the campaign. In addition, comparisons using items used in the first questionnaire were designed in order to measure changes.
- The "ambassadors" of the campaign to reduce driving speeds were given their own qualitative questionnaire.
- During the diffusion phase, at two points in time 30 people, serving as "social monitors", were asked about their perceptions of the campaign.
- Before, during, and after the campaign, driving speeds were measured at 10 locations in the community. This served as a gauge of the success of the campaign at the behavioral level.

RESULTS

The following presents the results of study 1 and then study 2. Results regarding diffusion are followed by description of intervention results.

Study 1

In order to attract the attention of the greatest number of potential participants in the action campaign and to expose them to the effects of the intervention instruments, the implementation of diffusion instruments is essential. What diffusion instruments were the most effective for this very large and dispersed target group, of which individual members could not be addressed personally? The most important means to inform drivers of coming campaigns was the use of signs and posters placed directly along the routes to the tunnel. 63% of participants and 61% of non-participants took note of this posted information. Of almost equal importance were reports in daily newspapers: 56% of participants and 50% of non-participants received information by this means. The “traffic jam” newsletter that was produced specifically to spread information was mentioned mainly by active participants. This newsletter contained the self-commitment forms that could be filled out and sent in postage-paid. 51% of this group were informed about the campaign by the newsletter, while 24% of non-participants were reached in this manner. The Internet, with mention by 25%, was an important source of information and, electronically, an easy way to send in a self-commitment statement. Radio and television did not play a central role. Although radio announcements, traffic reports, and radio and television shows mentioned the campaign, the number of people who were alerted to the campaign in this manner was relatively low, both for participants and non-participants. Also of less importance were fellow employees as well as family and acquaintances as sources of information about the action campaign. The use of the bumper stickers did not catch on, and so they played a negligible role.

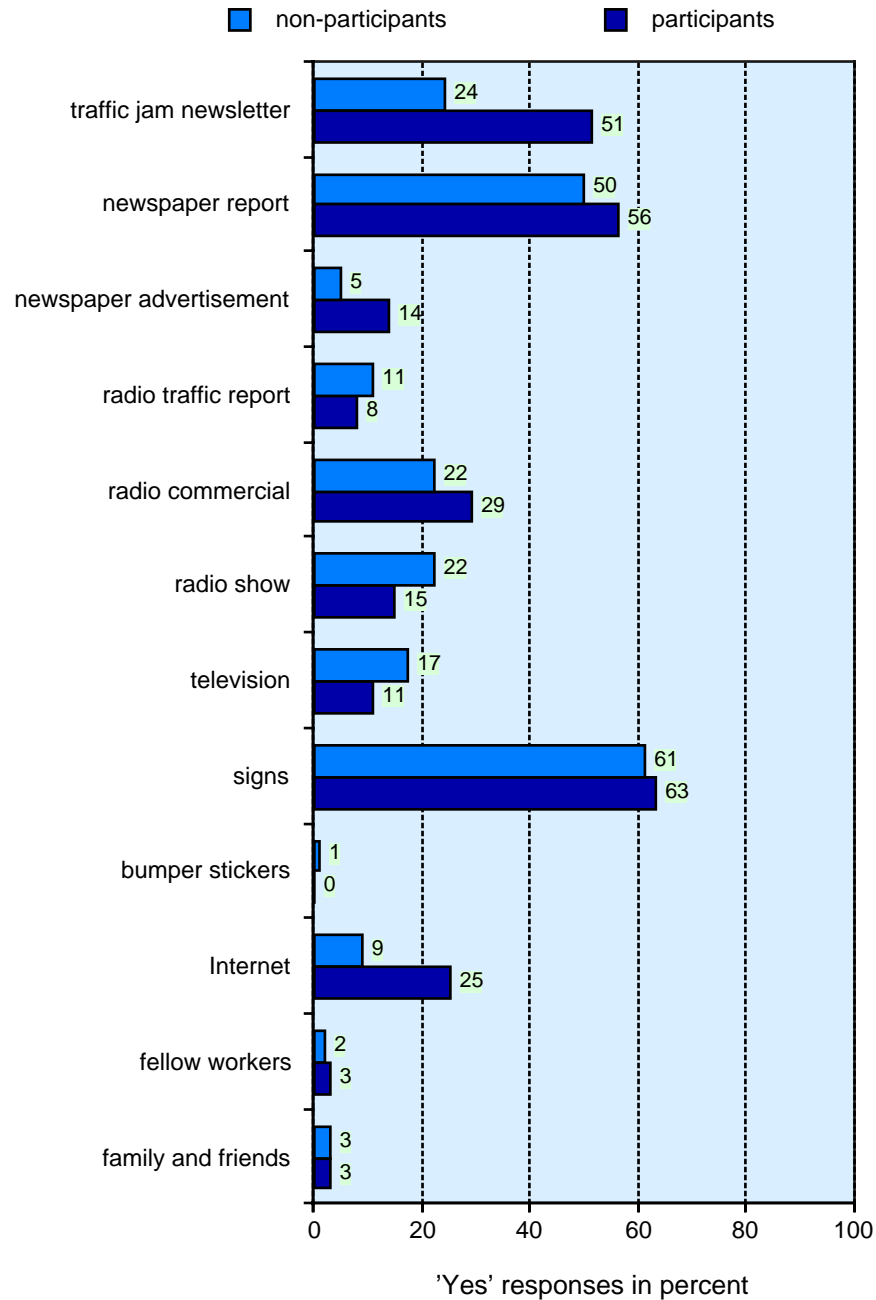


Figure 1: Diffusion instruments, study 1

The results in Figure 1 show that signs and posters hung locally, and thus relating topically and spatially most closely to the campaign, are a very effective, in cost as well, way to attract the attention of a specific target group. But because only a limited amount of information can appear on a sign, the complementing function of reports in daily newspapers, the traffic jam newsletter, and on the Internet became very important and effective. As a result of the comprehensive informing activity, more than 90% of the target group learned of the action campaign. The action

week became for both participants and non-participants a topic for discussion at home and at work.

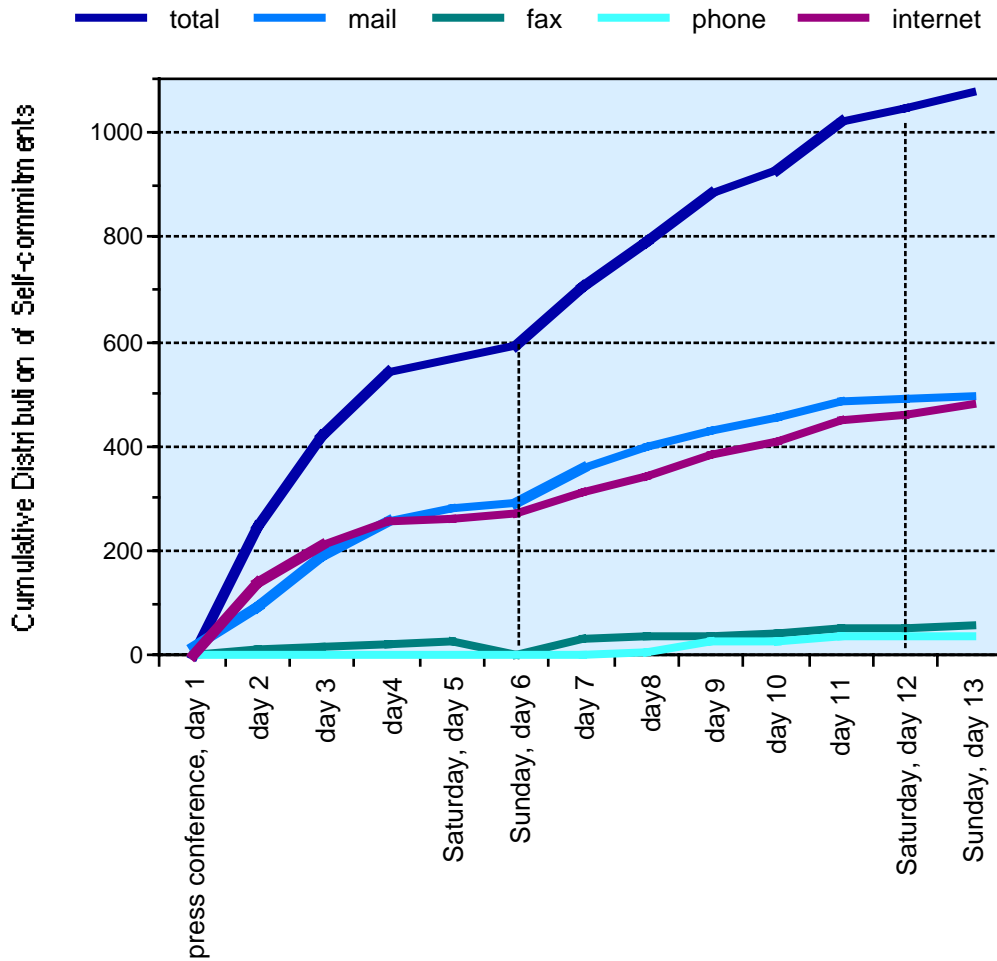


Figure 2: Cumulative diffusion chart, study 1

Figure 2 shows the success of the various diffusion instruments. From the launching of the initiative in a press conference up to the end of the action week, a total of 1,264 persons turned in self-commitment statements. It is interesting to note the steep curve immediately following the press conference that levels out ever more towards the end of the week: most of the participants made their decisions early and spontaneously. This means that they did not wait to see whether others would participate. The structure of the participants, in accordance with the planned variants of self-commitment, looked as follows: 25% (n=318) were persons who wanted to change their behavior during the campaign (participants), and 19% (n=244) committed themselves to continuing a practice they had already begun prior to the campaign, namely that they would periodically avoid commuting at the rush hours. 56% (n=702) professed support of

the action campaign, although themselves not able to contribute. All persons sending in the forms committed themselves with their names and addresses. The 318 participants making new contributions reported 1613 single instances that they would be willing to drive at different times or drive not at all. That is an average of 160 contributions at each of the 10 peak traffic hours during the action week. All of this information made clear before collective action began that our goal of reducing backups during the heavy traffic hours by 400 to 800 vehicles would not be achieved through the action campaign.

A very important topic in this study was the reasons why people might not participate. In the representative telephone interviews after the campaign, we asked non-participants in an open format why they did not take part. Figure 3 shows that about a third responded that they did not participate due to inflexible work hours. Another 26% stated that their driving routes that week did not go through the tunnel, 10% were obliged to drive as part of their jobs, and 7% stated simply that they depended totally on their cars for transportation. Public transportation was also cited as a reason: 5% did not participate due to poor public transportation connections between their homes and places of work, and 5% found public transportation too slow. 4% mentioned that carpooling was too difficult, as it was hard to find riders and it made travel inflexible. 4% thought the action campaign was useless and so they did not take part. 3% were not informed about the campaign.

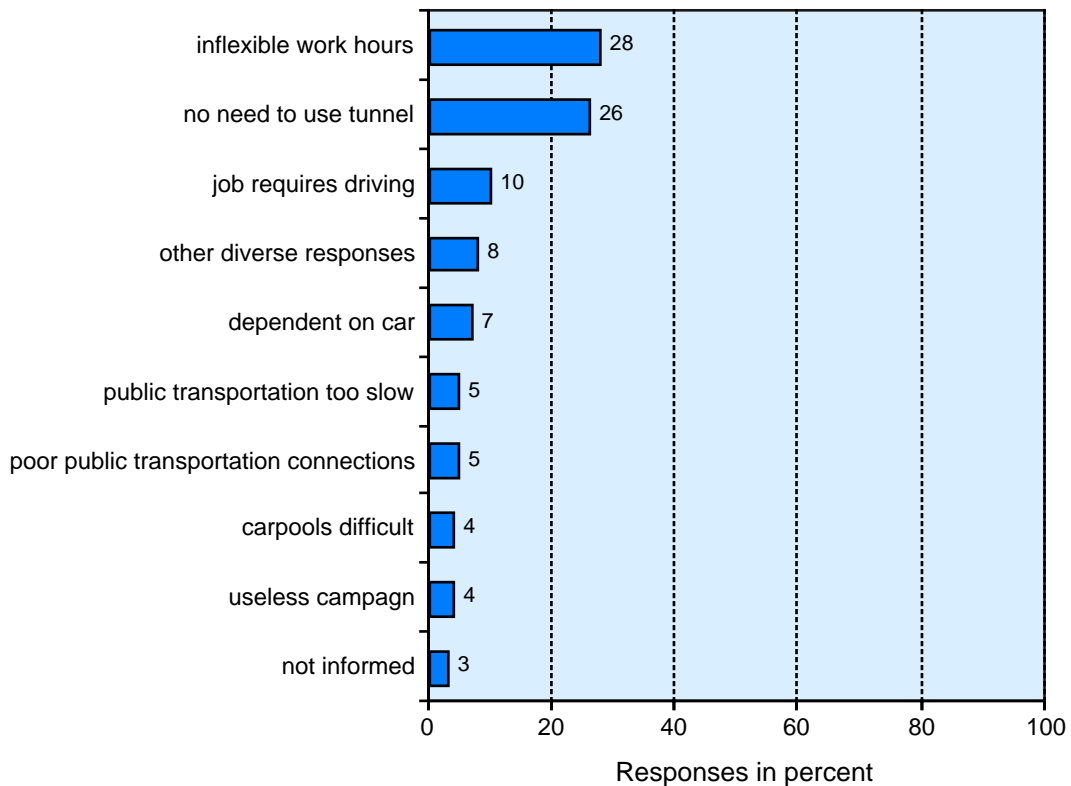


Figure 3: Reasons for not participating (free response question), study 1

In a next step, we asked non-participants if some further reasons might have played a role in their decisions not to participate (Figure 4). More than two-thirds believed that back-ups at the tunnel could only be solved through expansion of the tunnel. Thus, they had no conviction whatever that action could make a difference. Accordingly, about half justified their non-participation by stating that it would not have been worth the great effort required to change their daily schedules or that they simply had not been able to make those changes. Important reasons to take seriously were reasons based on time constraints: 54% stated that their work hours allowed no latitude for change, and 46% that they could not change their daily schedules.

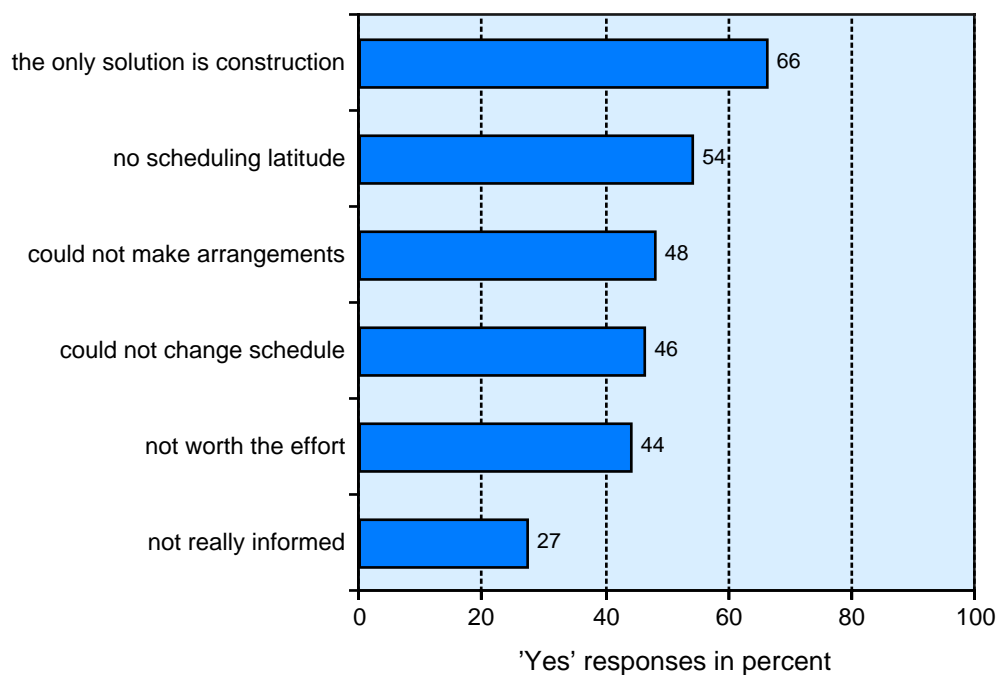


Figure 4: Reasons for not participating (answer items given), study 1

The issue of free-riders much discussed in the literature was also considered by the experimenters in relation to this study. Does the concern that others – without participating – will profit from one’s own efforts affect people’s decisions to participate? It appears that this is not the case. Non-participation was not determined by a fear that non-participating drivers would “free-ride”. Participants and non-participants made about the same evaluations of this problem, and weak trends in the expected direction are not significant (Figure 5).

The question now arises as to what features differentiate participants and non-participants. One significant characteristic crucial to the decision to participate seems to be one’s attitude towards voluntary participation in collective action. Figure 6 shows that 62% of participants have a positive attitude towards voluntary action campaigns in contrast to only 35% of the non-

participants. A skeptical attitude towards voluntary collective action is held by 46% of non-participants and 22% of participants.

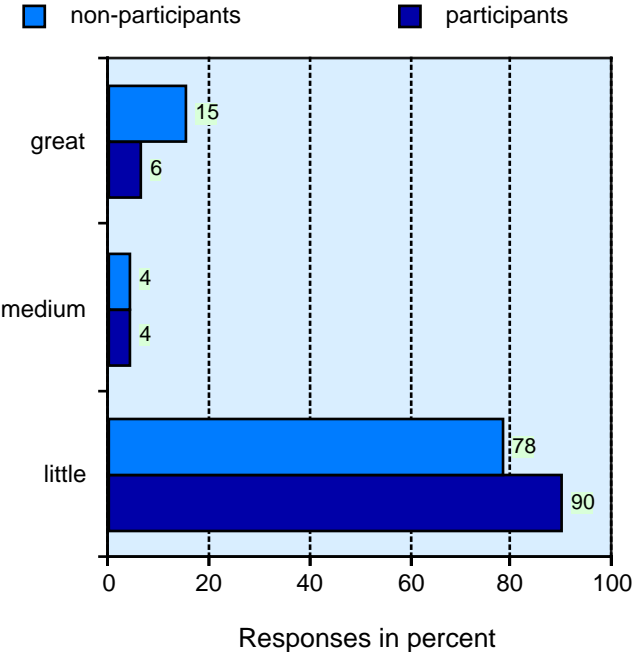


Figure 5: Degree of concern about free-riders, study 1

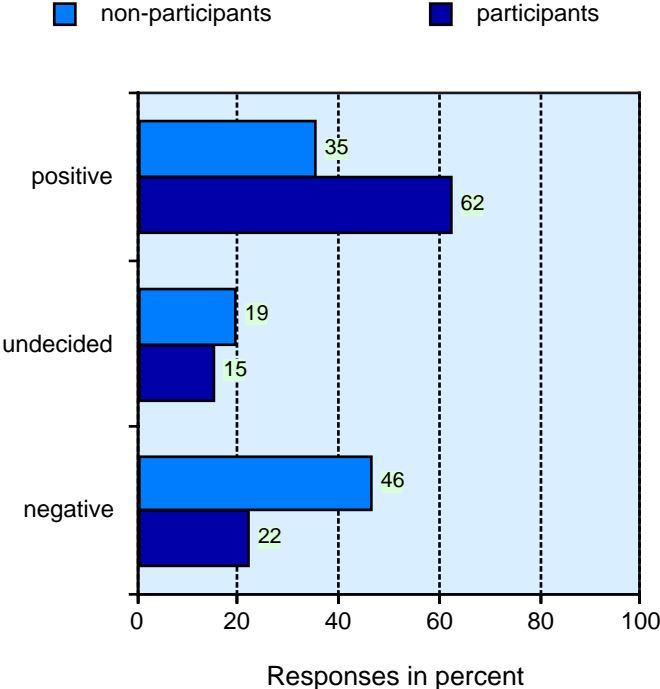


Figure 6: Attitude towards voluntary action campaigns, study 1

What about general expectations that voluntary collective action can be effective? We find here that the expectation that collective action can have an effect at all is a significant feature with regard to participation. As Figure 7 reveals, nearly half the non-participants have negative expectations. In contrast, more than half the participants (52%) held positive expectations, while for non-participants, just 38% had positive expectations.

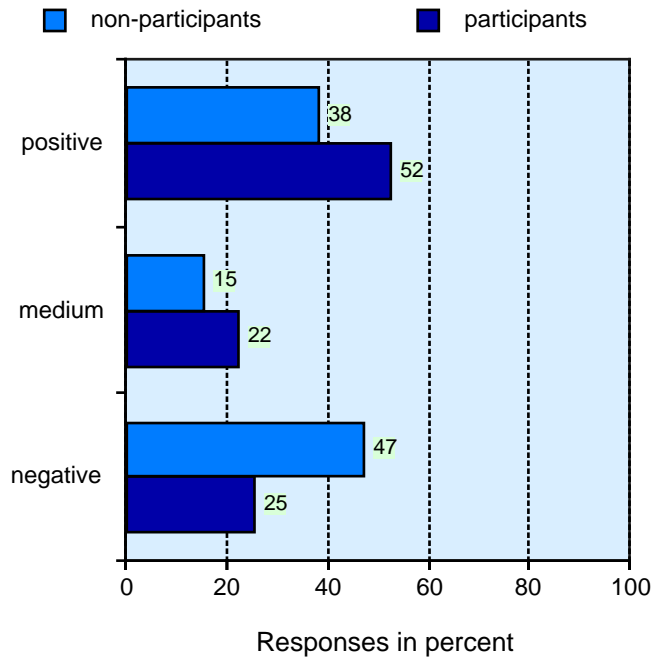


Figure 7: Expectations about the effectiveness of collective action, study 1

The findings are similar with regard to expectations of the effectiveness of this particular action campaign. Again, participants and non-participants differ clearly. Participants had higher expectations that the action would succeed (66%) than non-participants (41%) (Figure 8).

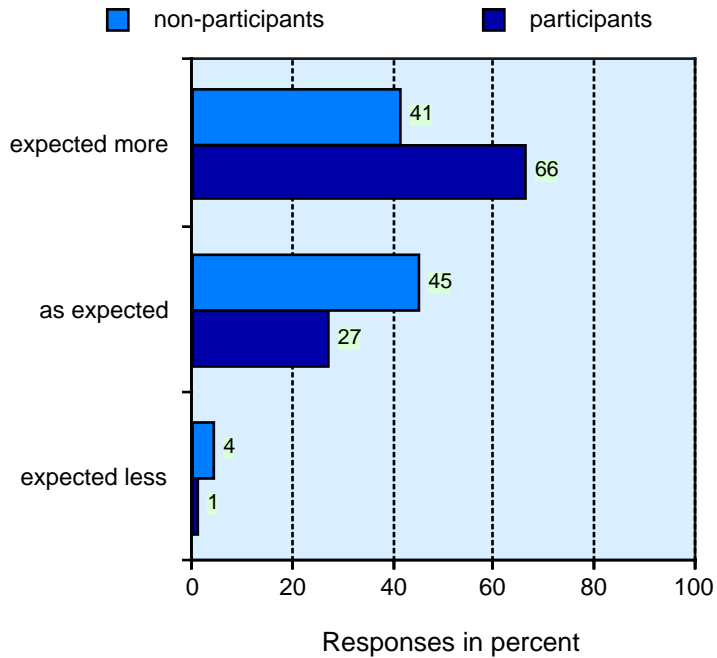


Figure 8: Expectations of success for the traffic campaign, study 1

Further statistical analysis indicates that the attitude towards voluntary collective action influenced general expectations of the effectiveness of the tunnel action campaign and that this, in turn, influenced the decision to participate. Participants who believed in voluntary collective action and also believed that collective action could be effective in combating traffic congestion at the tunnel, had stronger expectations of success for the campaign and thus decided to take part.

The next figure shows the emotions that participants experienced (Figure 9). For 70% of the participants, participation was accompanied by feelings of satisfaction. About a third felt proud and experienced a sense of community spirit. On the other hand, only a minority of 16% reported that participation in the action gave them the feeling that they could rely on others.

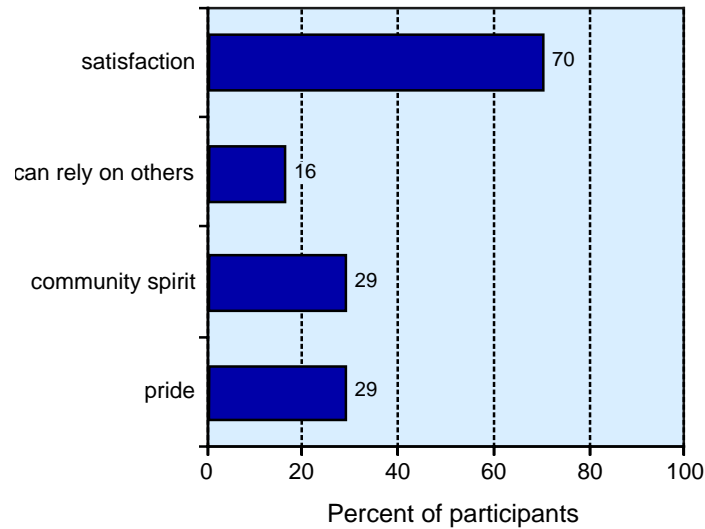


Figure 9: Psychological effects of participation, study 1

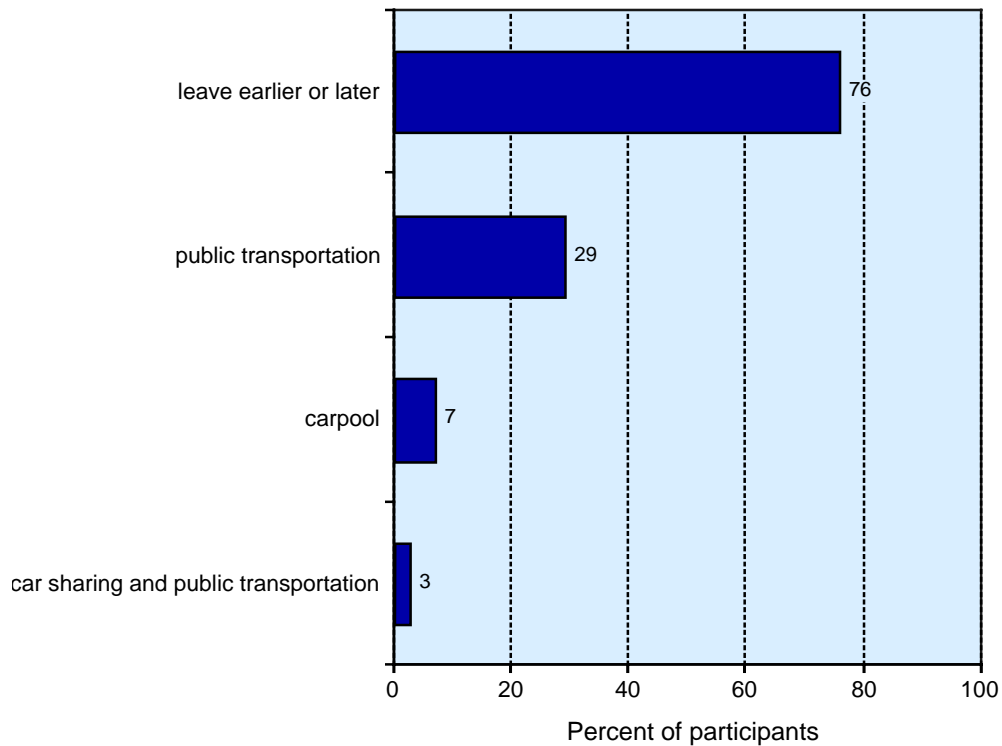


Figure 10: Type of self-commitment (multiple responses), study 1

In Figure 10, we see the forms that self-commitment to participate took and the effects achieved in the common pool resource. The Figure shows the ways that people put their self-commitment into practice. In order to unburden traffic at peak rush hours, starting out earlier was the most popular contribution. 76% of the participants reported that they left their homes or workplaces either earlier or later at least once. 29% used public transportation instead of driving at least once, and 7% joined others in a carpool. Only 3% made use of a combination of public transportation and car sharing.

Due to insufficient diffusion, the effectiveness of the collective action was limited; the number of participants remained below expectations. Still, the action week achieved a reduction in traffic delays of 10%, or 2 hours. Per average hour of traffic congestion, 100 cars fewer than usual passed through the bottleneck, rather than the 400-car reduction that had been the goal (Figure 11).

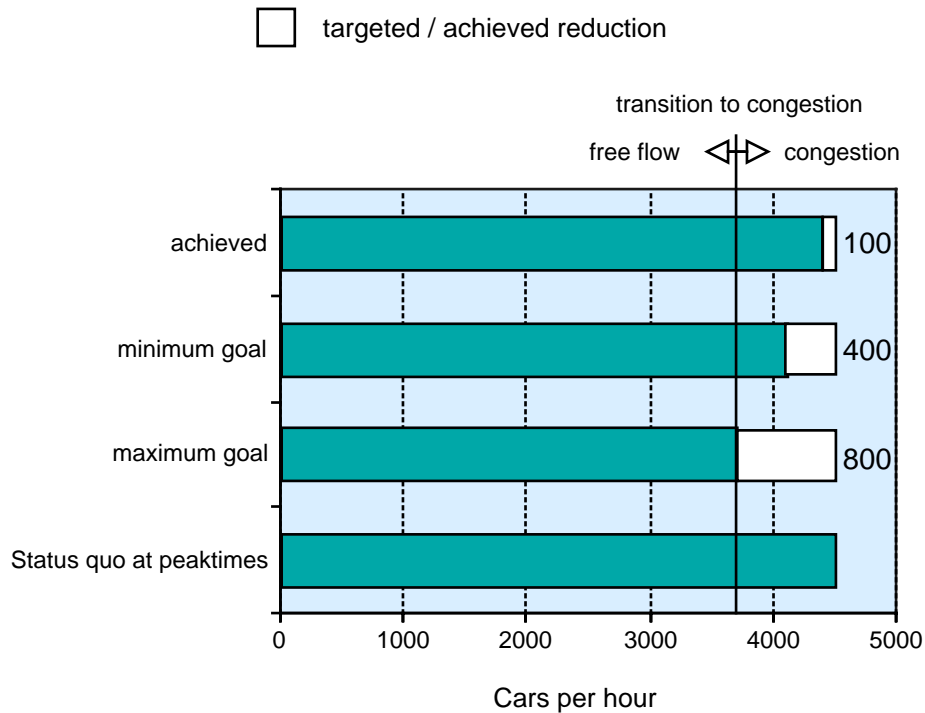


Figure 11: Targeted reduction and reduction achieved, study 1

Despite this limited success, people who participated in the action week from June 7 to 11 in 1999 were convinced. 80% of the participants suggested that similar campaigns should be repeated in the future. Astonishingly, 55% of the non-participants also supported continuation of such campaigns. When asked if they would take part in future campaigns, 97% of the participants stated that they would take part again. In contrast, only 23% of the non-participants said that they themselves would participate.

Study 2

Early in the diffusion phase, traffic commission members, in their role as “ambassadors”, set out to recruit local political parties, clubs, and businesses known to them for membership in a “supporters’ club”. Supporters’ club members could support the action campaign with sponsor contributions and their own personal participation. In return, they were named in practically all the information materials distributed for the campaign. The campaign gained the support of 20 businesses, 11 clubs and organizations, and 6 (or 8) local political parties as members of the supporters’ club.

A qualitative survey of the ambassadors revealed the following: Ambassadors turned on the whole to individuals, such as business owners or club presidents, who themselves had access to the larger groups. These people were typically personal acquaintances or fellow workers of the ambassadors. The groups accessed were clubs or businesses, and in one case, a political party. All the ambassadors reported that they had spoken face to face with the people they turned to. We estimate that the number of people appealed to lay between 50 and 100, in some cases more than 100. “Take an active role in your community” was found by the ambassadors to be the most effective argument for participation in the neighborhood campaign. Another effective argument

was “improve safety on the road”. In contrast, the ambassadors did not often find the “environmental aspect” to be an effective argument.

The reason for not participating most often heard by the ambassadors was that the action would have no results and would not solve the speed problem. Some people told the ambassadors that they were against all such action campaigns and stood against the principle of self-commitment. Never mentioned were reasons such as having no time to participate, that there would be too much effort required, or that the purpose of the campaign was unclear. All the ambassadors rated their own roles as positive and stated that they would in the future be willing to be at the disposal of a similar campaign.

The core element of diffusion was a flyer explaining the goals of the action campaign and the arguments for speed limits of 30 km per hour. A tear-off section of the flyer was the form for self-commitment. The flyer was made available to the public using the following diffusion instruments:

- Information booths: On three occasions, members of the traffic commission and town selectmen set up a stand to gain the support of passers-by for the campaign. The booths were set up at the Christmas fair and for a half-day each in front of the two most frequented shops in the area.
- Dispensers: Information flyers and self-commitment forms were placed in various shops, the town hall, and in businesses and clubrooms. Self-commitment forms could be turned in on the spot or sent in by postage-paid mail. Moreover, participants were given the task to spread the word: One month prior to the action phase, registered participants received a letter that asked them to tell others about the campaign and to give them an information flyer.
- Further elements of diffusion were utilized to alert residents to the campaign and urge them to participate:
- Success barometer: At a rotary in the center of the community we set up an eight-meter high tower. A moveable counter showed the current number of people agreeing to participate. The numbers in Figure 12 show that this spectacular method of giving feedback to the community on the status of collective action willingness gained a lot of attention, particularly also in non-participants.
- Press: During the Christmas Fair activity and repeatedly throughout the action phase, the local media (local newspapers, radio, and television) as well as the national media (newspapers, television) gave reports on the campaign. Before, during, and after the action campaign, press conferences were held.
- Advertising campaign: We placed regular advertisements in the local papers belaying arguments against the collective action project that became known to us through the questionnaire prior to the action phase.
- Posters / shop windows: 15 posters with slogans supporting the campaign were displayed on community streets and two local shops placed informative displays in their windows.
- Role models: Advertisements and posters publicized names of participants (with their permission) in so-called “team player” lists. Organizations taking part in the supporters club also appeared.

Figure 12 presents the quantitative results of asking participants and non-participants how they had become aware of the action campaign. Important diffusion instruments proved to be the

dispensers of the flyers (28% of the responses), the information booth at the Christmas Fair (32%), and personal conversations (25%). As attention-getters, the feedback tower and the posters were clearly the top instruments.

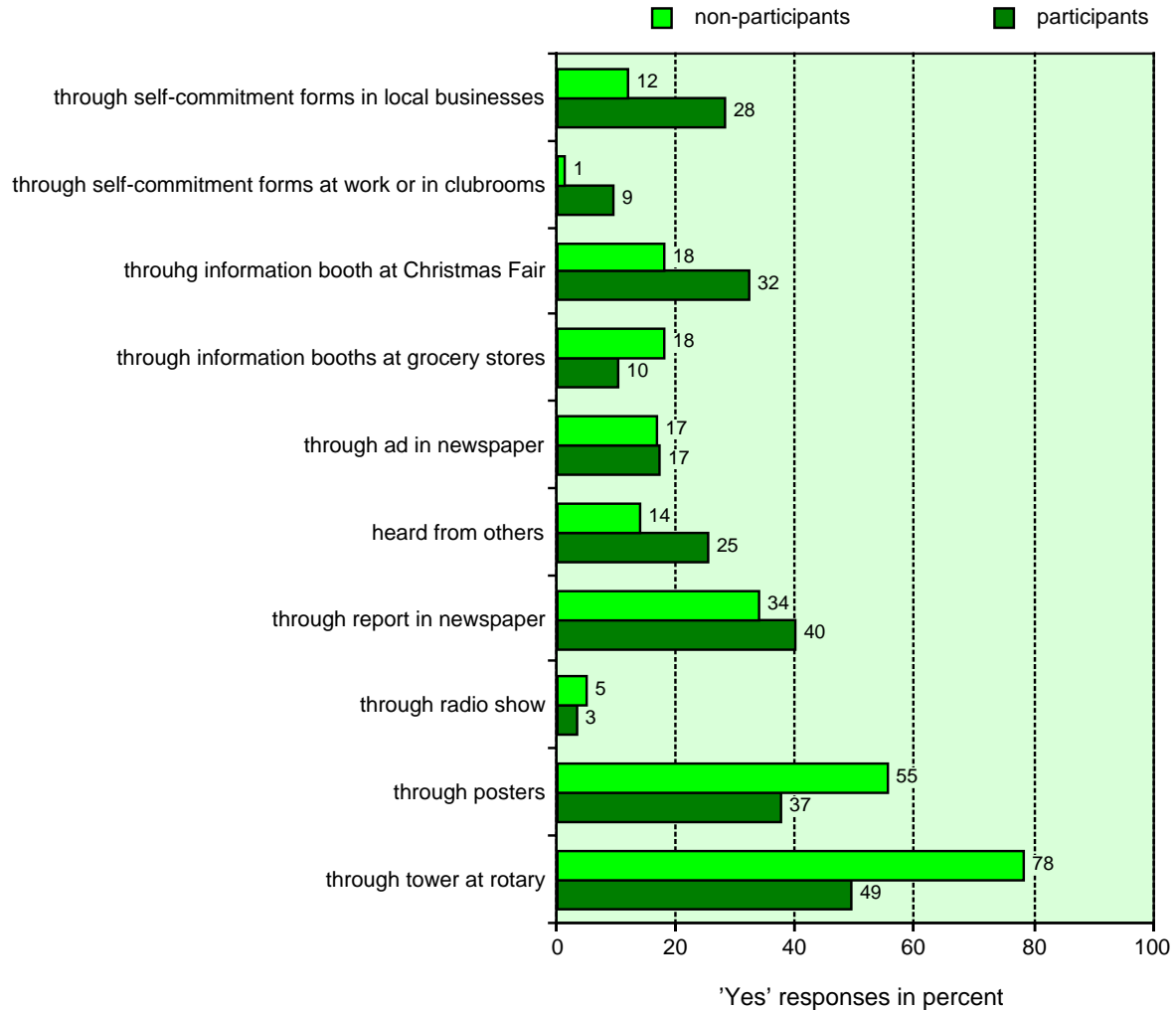


Figure 12: Diffusion instruments, study 2

Figure 13 reveals the paths on which the flyers with the tear-off forms for self-commitment reached the participants. Here again we see the overwhelming importance of personal contact at the Christmas Fair and in the locales of local businesses and shops: almost two-thirds of the participants were reached in this manner.

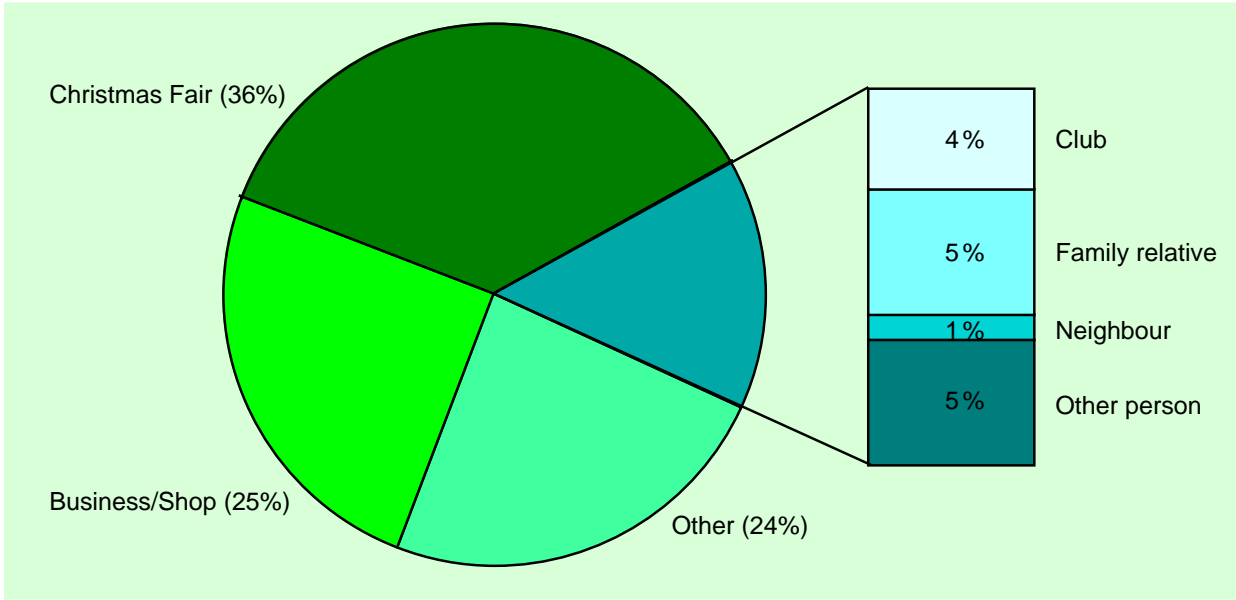


Figure 13: Diffusion path of the forms for self-commitment, study 2

Similar conclusions can be based on Figure 14. The steeply rising curve of participation following each information booth demonstrates the great success of this method of diffusion.

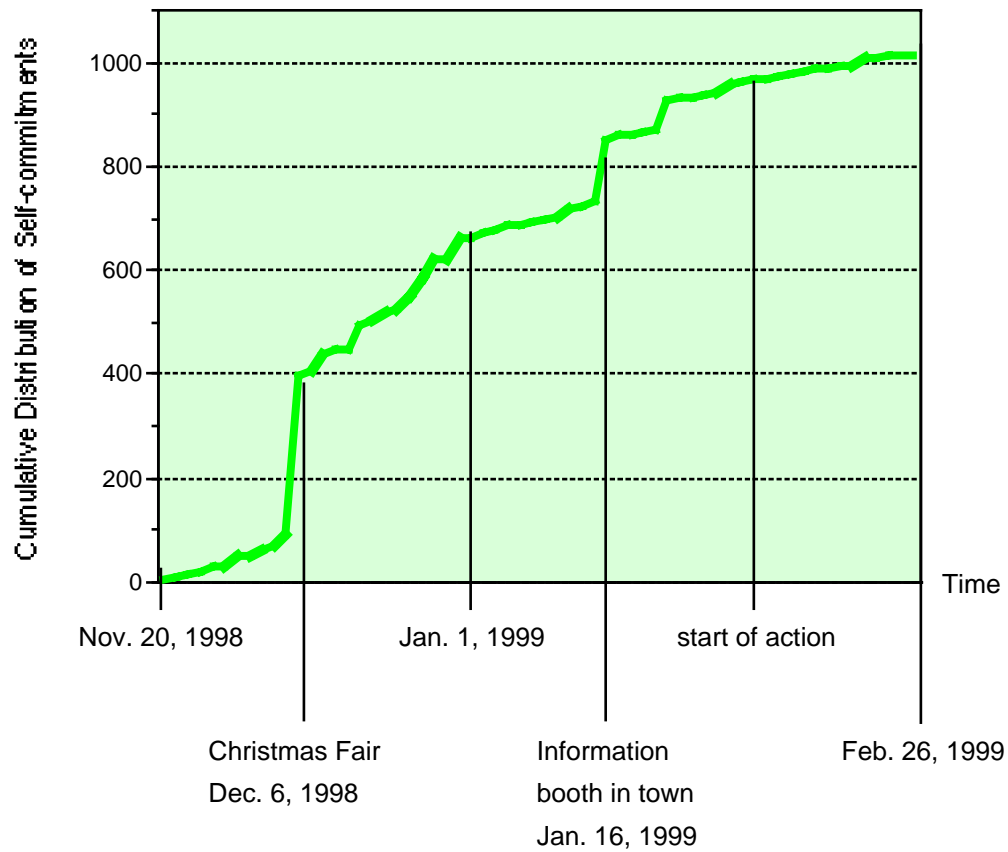


Figure 14: Cumulative diffusion chart, study 2

We see that the information both at the Christmas Fair gained the participation of about 350 people. Between the Christmas Fair and New Year's, another 250 persons joined in. The information booths in front of local grocery stores recruited another 150 participants. An appeal to those already registered just prior to the start of the action phase brought in another 100 participants. Once the action phase began, there were no particular attempts to recruit more participants, but another 50 persons joined in. With a final number of 1015 participants, representing approximately one-fifth of all registered drivers in the community, the diffusion can be declared a success.

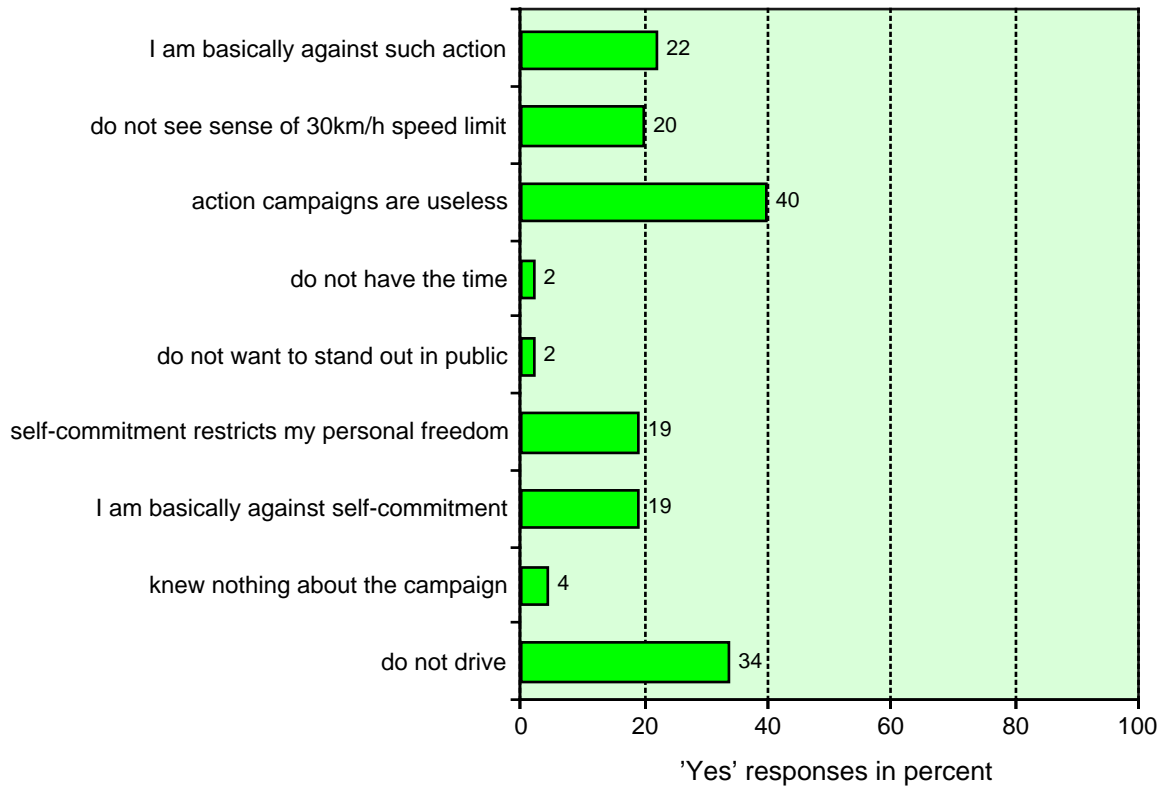


Figure 15: Reasons for not participating (answer items given), study 2

Let us examine the reasons in study 2 for not participating. The most frequently mentioned reason was that people did not expect the action campaign to be effective. 40% of the non-participants stated that such things were useless. Another 22% expressed a negative attitude towards this kind of collective action. With a lack of motivation to provide the public good, 20% stated that they did not see the sense to a speed limit of 30 km per hour. Also meaningful was a reluctance to restrict personal freedom (19%).

The reasons given for participating, on the other hand, are shown in Table 1.

Table 1: What made you decide to self-commit? (n=118, multiple responses possible), study 2

What made you decide to make a self-commitment?	Number of Responses
I always support environmental causes	67
I studied the information materials and was convinced	52
I decided to commit on the spot at the information booth	16
The person who explained the action to me was competent and engaged	15
Discussion with friends and acquaintances convinced me to take part	13
The person who explained the action to me was trustworthy	13
Reports in the press convinced me to take part	11
I enjoy undertaking things together with others	11
People who are important to me were participating	9
I had a look at what had come of the action in Münsingen	6
I noticed that many people around me were taking part	6

Apparently the quality of the information materials was important. We know from the ambassador questionnaire that environmental arguments were of little influence and that safety considerations were the most convincing. On the other hand, the fact revealed here that the participants came from circles that routinely support issues having some connection with the environment (noise pollution, emissions) is not a surprise.

Participants recruited in the diffusion phase were now to change their behavior for the five months of the intervention phase by reducing driving speed in the neighborhoods. The following intervention instruments were used:

- (Public) self-commitment: Signing the form in the flyer committed participants to drive more slowly and keep to a speed limit of 30 km per hour in the neighborhoods. With their permission, the names of participants were publicized on posters and in advertisements.
- Prompts (reminders): As constant reminders, 120 three-meter-long, colored flags with the action logo were hung on streetlights throughout the community. In addition, participants received key chains and bumper stickers with the action logo through the mail. The success barometer, posters, and press coverage also served as reminders.
- Feedback instrument: Feedback on driving speed was provided to drivers through the use of a mobile unit that measured driving speeds. The actual speed of each automobile appeared posted on an electronic board.
- Role models: Participants served as role models not only through publication of their names. They also functioned as role models by means of their apparent slow driving and by identification as a participant in the form of bumper stickers.

Figure 16 shows the effectiveness of the various types of reminders in alerting people to the reduced speed campaign. The colored flags along the streets received most mention (71% of participants, 57% of non-participants), followed by the roadside speed measurement board and the posters.

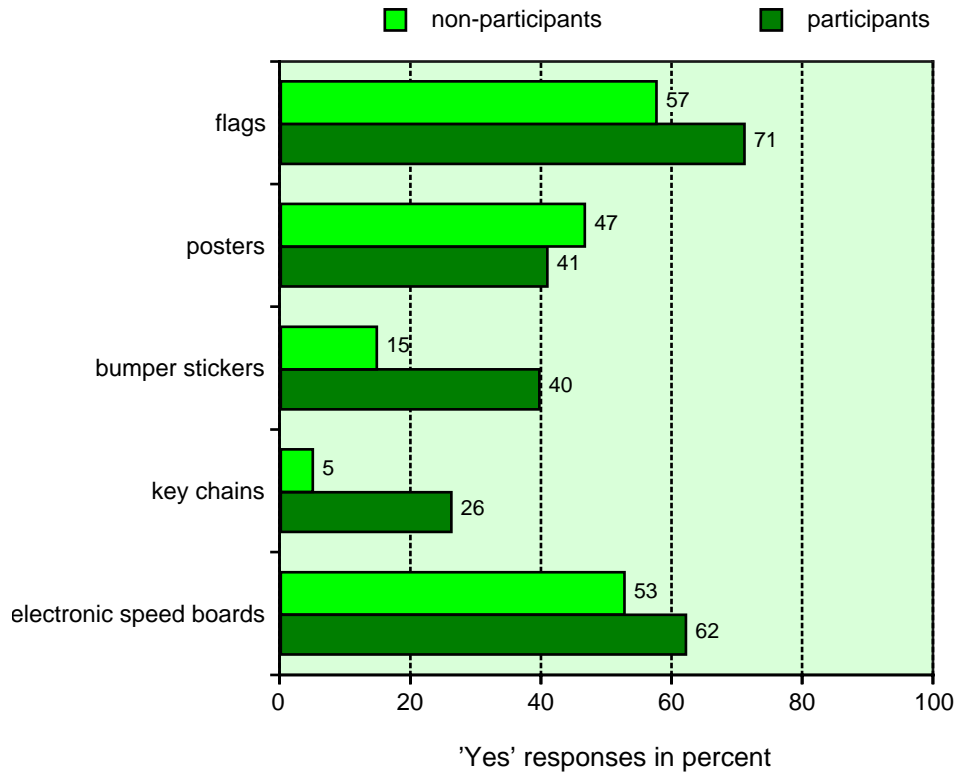


Figure 16: Reminders, study 2

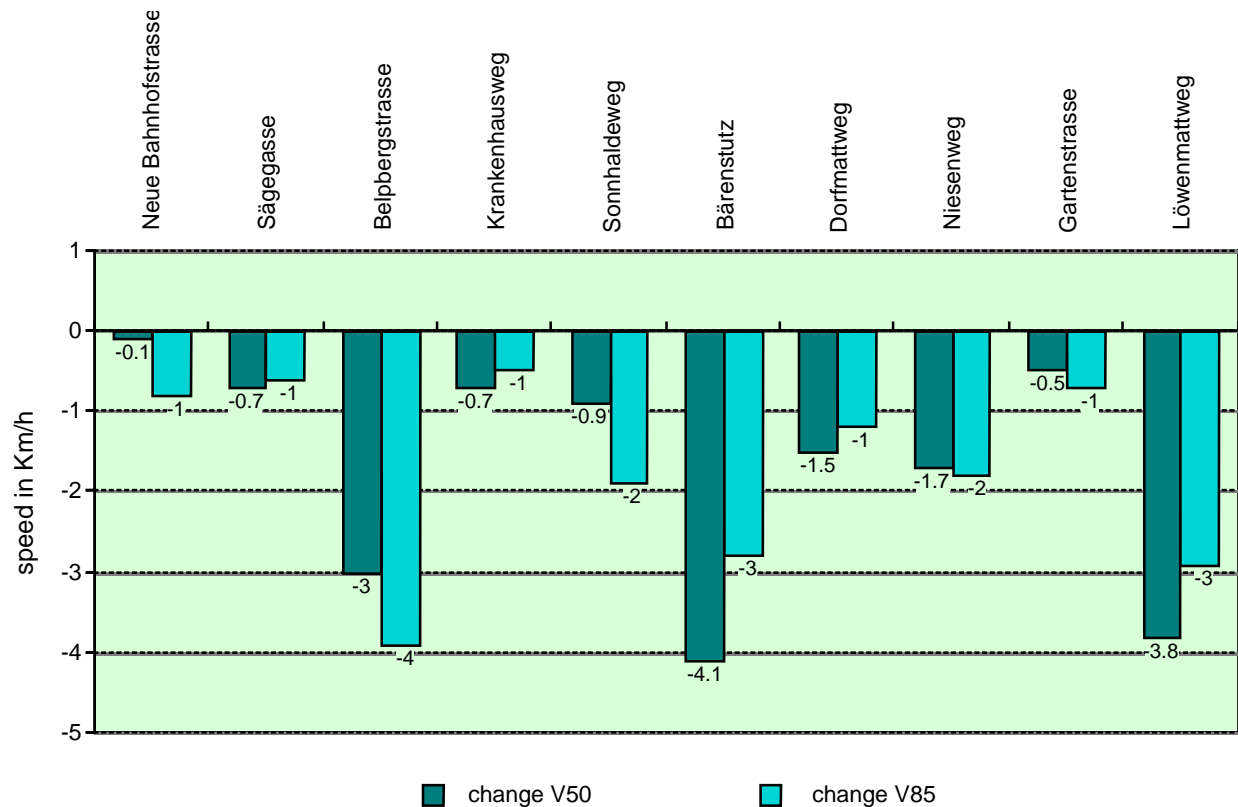


Figure 17: Changes in driving speeds measured, study 2

What effects did the action achieve? Was the public good “reduced driving speed” created? The reduction in driving speed achieved through collective action was indeed remarkable and was comparable to that achieved in Graz, Austria, for example, through compulsory laws and police control. Figure 17 presents the numbers, broken down for the individual streets in the neighborhoods. They show that success was not the same for all streets. V50 and V85 are standard measurement values used in the field of traffic science and stand for the speeds that are maintained and not exceeded by 50% and 85%, respectively, of vehicles. Figure 18 shows a similar picture: the percentage of vehicles that did not exceed 35 km per hour during the campaign is clearly higher than before the campaign.

The collective action lasted from February through the end of June in 1999. At present a post-study is examining the long-term effects of the campaign.

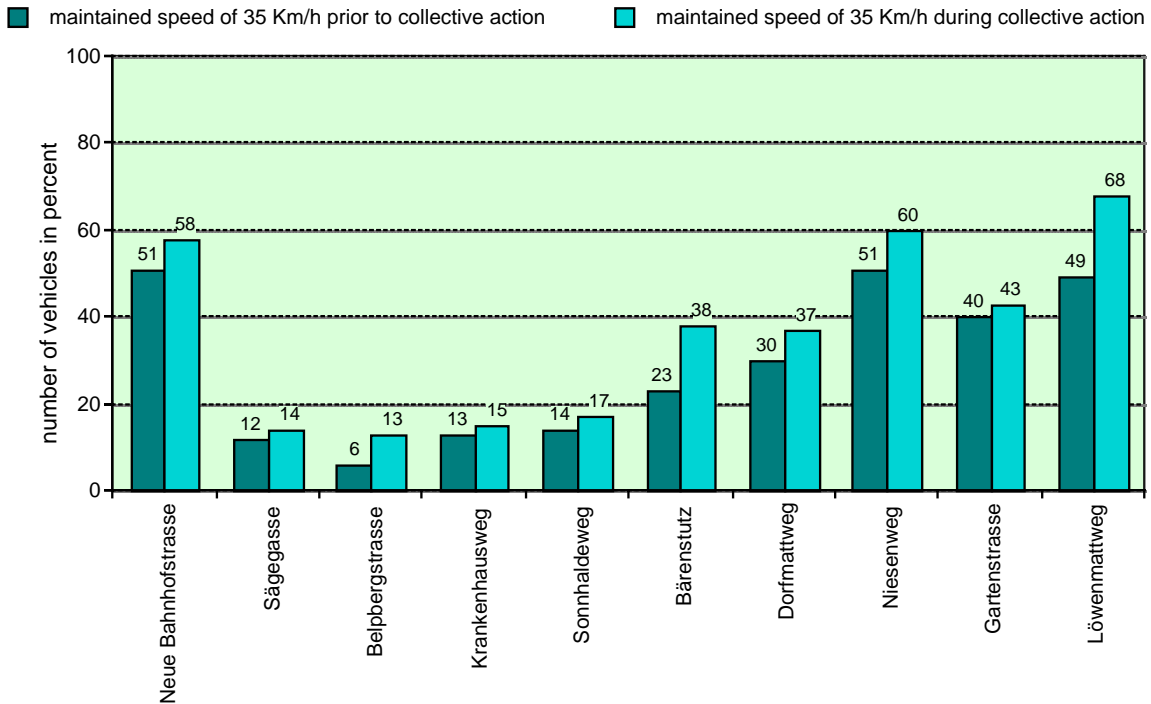


Figure 18: Percentage of vehicles not exceeding 35 km per hour, study 2

DISCUSSION

Evaluation of the success of the diffusion instruments in attracting public attention shows overwhelmingly in both studies that informing people on a local and target-group basis is very effective. Posters and informative signs appeared to fulfill this function well in both studies, and daily newspapers also proved to be effective information media. Signs and posters, of course, contain limited information. Short texts on posters and signs must be read in a few seconds as a driver passes by. Daily newspapers are probably an important medium because they provide more extensive and deeper information. The course of diffusion in the two studies is hardly comparable, although the curves show certain similarities. The curves are steep at first, which indicates that there was a rapid increase at the start of the campaign, and then become flatter, showing that the increase gets smaller and smaller. The differences found in the two studies lie in the extent of diffusion reached. Diffusion is insufficient in study 1 and good in study 2. The different rates of diffusion are due to differences in accessing the target group, or the target group's accessibility, which determined the diffusion instruments that could be implemented. In study 2, due to the local context, the opportunity to appeal to passers-by personally (ambassadors, information booths) was crucial to the success of the early diffusion period. For study 1, there was no possibility of communicating directly with the target group through existing social networks, and for safety reasons, we could not approach drivers in the traffic jams on the street. In study 1, daily updates of the number of drivers taking part in the action campaign showed steady but apparently not convincing or infectious progress. The updates were communicated in real-time on the Internet and daily on information signs posted by the roadway traffic jam. Our hope that we could reach the very dispersed target group through radio,

television, and the printed press and, in analogy to direct two-way communication, have them reach us through the hotline, web page, and e-mail in a convincing and personalized way was only partly fulfilled.

The data in both studies suggest that our *intervention instrument*, public self-commitment in writing, functioned well. The effects documented by measurements show that people held to their self-commitments – even without external social sanction mechanisms or threats. The demonstrated effects can not be explained in any other way. The effect on a person's behavior of submitting a self-commitment – in view of a potential inconsistency between the public promise and actual behavior – bases on two aspects. First, consistency serves to avoid the psychological costs of an uncomfortable dissonance between behavior and self-commitment. Such costs involve the loss of, or threats to, self-respect. Second, implicit or imagined social costs in the form of loss of trust can be avoided as well. The data in study 1 show that our attempt to foster mutual trust in the framework of collective action through this means did not succeed well enough (see Figure 9).

This leads to the question of the psychological determinants of participation or non-participation. What was the crucial factor in the decision to participate? One important finding is that fear of free-riders, much discussed in the literature, was definitely not the reason for the low rate of participation in study 1. The extent of this fear was on the whole very limited. While non-participants did mention this fear somewhat more often than participants, the difference was found to be not significant. The important differences, however, that do distinguish participants from non-participants lie in the areas of attitudes and expectations of effectiveness. Participants in study 1 had a much more positive attitude towards voluntary collective action as well as clearly higher general expectations of collective action in terms of successful effects. Similar indications come from study 2, with the finding that non-participants very frequently explain that they did not participate because they had a negative attitude towards collective action and did not expect such collective action to succeed. For a person to make an individual behavioral investment in collective action in order to provide a public good, it seems crucial that the public good in question be important and positive and that the individual expect that the attempt to provide the public good will be successful. If the probability of success seems too low, the risk of losing one's own contribution becomes too high – it is just not worth the effort. The difference between participants and non-participants with regard to concrete expectations of collective action in study 1 is a clear indication of this. An additional difficulty may have been the fact that in study 1, reducing traffic congestion was described in the communications rather as a discrete public good and then also seen by participants as such.

In the last run, for individuals faced with a decision for or against participating, their own store of information may be decisive: the extent to which a person is informed about the current status of the process of providing the public good and the expectations the individual has of the different effects of early or later contributions in the temporal course of providing a particular public good.

Our own research group – on the basis of social-psychological concepts and with the aid of simulation tools – has begun to focus mainly on the central problem of the interaction of the two levels of individual decisions to participate and the collective. Within the framework of a microanalytical-aggregative simulation approach, we have succeeded in designing an actor model that on the basis of simulation experiments yields very concrete recommendations for the

conception, planning, and organization of collective action campaigns (Mosler & Tobias, in prep.; Mosler & Brucks, in prep.).

In accordance with the theory of planned behavior (Ajzen, 1985; Ajzen & Madden, 1986), the intention to participate is influenced in the model by attitude towards participation, subjective norms regarding participation, and perceived behavioral control. In addition, in correspondence with the elaboration likelihood model (ELM, Petty & Cacioppo, 1986; for computer simulation of the ELM, see Mosler, Ammann & Gutscher, 1998), attitude is conceived of as dependent upon the persuasive influence of other actors. Independently of these components, the intention to participate is also calculated as affected by the benefit expected after reckoning use of the public good, the costs of contributing, and possible additional incentives. Here is very important to take into consideration the subjective expected dynamics of the establishment (production function) of the public good. When the dynamics are “slow” (a public demonstration, for example), initial contributions have a minimal effect. In contrast, with “fast” dynamics (for example, setting up a blockade at a bottleneck), initial contributions have a great effect. In principle, widely varying production functions, in dependency on contributions already made, could conceivably have very different effects on the motivation to participate.

The research results presented here stand as initial, rough indications of the importance of these concepts. Future studies will turn increasingly to an investigation of the difficult problem of operationalization as well as to analysis of the connections among the concepts.

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AUTHOR'S NOTE

Study 1 was conducted in the framework of a commission by the Baudepartement, Kanton Aargau, Aarau, Switzerland. Responsibility for the project was carried by a team of the following members: Stefan Schneider, Planungsbüro JUD AG, Zuerich; Prof. Dr. Heinz Gutscher, Science Consulting, Zuerich; and TSR Kampagnenbüro, Zuerich.

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Niederberger, Bauverwaltung Muensingen; members of the traffic commission of Muensingen, and Suzanne Michel, communications consultant, Niederwangen.

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