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# Are citizens not accurately informed about long-term societal costs of unsustainable travel or do they not care?

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ABSTRACT

We argue that people think more about the short-term individual benefits of personal motorized travel than the long-term societal costs. One explanation is that people are more concerned about their own wellbeing and the wellbeing of their close relatives than the well-being of unknown others. Another explanation is that people have less knowledge of the long-term societal costs than of the short-term individual benefits. Research findings documenting long-term societal costs may increase this knowledge if accurately conveyed by governments, mass media, producers and providers of travel services, and opinion leaders. We identify several obstacles to such an accurate dissemination of research findings that need to be removed.



## Introduction

Sustainability of the environment is at the top of policy and research agendas throughout the world. A search of the Internet reveals that the term "sustainable" is related to (among others) food, clothes, offices, agriculture, and architecture. It does not come as a surprise then that also travel, which is a significant part of people's daily consumption, is also viewed from a sustainability perspective. A transportation journal (*International Journal of Sustainable Transportation*) is dedicated to the topic. The relationship between travel and sustainability is also discussed in many papers published in the regular transportation literature.

In this paper our focus is on measures minimizing personal travel by cars to abate its negative sustainability effects. However, exclusively focusing on this denies the fact that transport policies should not only be valued for their environmental outcomes but also for their social and economic outcomes, and that these outcomes occur at different temporal and spatial scales. Yet, we conjecture that, both among citizens and politicians, thinking about the benefits dominate the costs, and that this is an obstacle to changes to sustainable travel.

Despite that the negative sustainability effects are well documented by research, it appears difficult to change personal car travel towards more sustainable practices. We will argue in this paper that this is partly due to the way in which people trade-off individual vs. societal, immediate vs. deferred, and local vs. global benefits and costs. We will discuss the role dissemination of research findings in the society may have for these trade-offs in counteracting choices of more sustainable travel.

The paper is organized as follows. In the next section we discuss the different sustainability effects of travel. Then a section follows in which we briefly review explanations of why people in general think about short-term individual benefits instead of long-term societal costs. In the final section we discuss how research findings documenting long-term societal costs of travel are disseminated through governments, mass media, producers and providers of travel services, and opinion leaders.

## Sustainability of travel

Over the past decades many definitions of sustainability have been proposed (e.g., Amekudzi et al., 2009; Miller et al., 2013), including a wide variety of indicators. Without attempting to review these definitions in any detail, it is noted (see Van Wee, 2014) that two approaches exist in defining sustainability. The first approach emphasizes the intergenerational aspect and states that the current generation should not exploit resources in such a way that the needs of future generations are jeopardised. A second approach stresses that social, environmental, and economic outcomes should be balanced in a sustainable transportation system. Social implications typically refer to the options offered by the

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transportation system for participating in activities such as work, education, social interaction, and leisure fulfilling the requirements of a preferred lifestyle (Delbosc and Currie, 2011) but also to the experience of travel itself (Ettema et al., 2010) and health outcomes related to exposure to pollutants, noise, and lack of physical activity (Handy, 2014). Environmental implications of travel are also diverse including aspects such as health effects of exposure to pollutants and noise, pollution of soil and water, deterioration of landscapes and habitats, and emission of greenhouse gases (see Van Wee, 2014; Hensher and Button, 2003). Economic aspects of transportation systems mainly concern their role in the functioning of firms, labour markets, and production processes, but may also involve the costs caused by negative environmental or social effects (e.g. noise reduction measures or investments to reduce congestion).

Taking into account social, environmental and economic outcomes implies that any transportation system includes both costs and benefits making trade-offs necessary. For instance, if restrictions on personal travel by cars are imposed by higher fuel prices in order to reduce negative environmental effects, this may have negative impacts on people's participation in activities. In a similar vein, it may lead to price increases of production processes with negative economic impacts. Thus, a transportation system that is sustainable in both an environmental, social, and economic sense requires a balanced set of policies. Finding the "right" set of policies is further complicated by the fact that positive and negative effects of travel may occur at different temporal and spatial scales and in different social contexts. With respect to social context, it is typically the case that benefits accrue at the individual level while costs are incurred to society as a whole or on specific groups. For instance, urban highways allow individuals to travel to their destination quickly and conveniently, but emissions they produce contribute to polluting the atmosphere in a larger area, affecting many people. In addition, it has been found that those benefiting most from car travel (and thus contributing the most to pollution) and those suffering most from pollution are typically different groups, consisting of different social strata. Similar mismatches between those causing negative effects and those experiencing them are observed at a global scale due to greenhouse gas (GHG) emissions. Residents of islands in the Pacific that are threatened by rising sea levels are typically not those producing disproportional amounts of carbon dioxide.

Regarding spatial scale, the most fundamental distinction is between the local and global levels. While benefits experienced by individuals take place at the local level (e.g., experiencing a quicker journey or being able to reach a specific holiday destination), effects may occur at wider geographic scales. For instance, acidification and air pollution, stemming from local sources, may extend to the scale of city regions. The most extreme scale difference is observed in the context of GHG emissions, where local, individual benefits contribute to global changes in atmospheric concentrations and global sea level rise as well as regional climate changes throughout the world. With benefits and costs arising at different spatial scales those experiencing them will be different groups, raising equity issues.

Finally, benefits and (environmental) costs typically manifest themselves at different time scales. While social benefits are experienced instantly, knowledge and awareness of environmental costs may lag behind several decades or more. During most of the era of mass motorization, people have not been aware of the effects it has on climate change. In most cases, a certain level of accumulation of pollutants or GHG emissions is required before tangible effects (diseases, climate change) can be observed and measured. This lagged effect, combined with the fact that those causing the costs are not necessarily those bearing them, results in that travellers are only to a limited extent confronted with the consequences of their behavior. In addition, it raises issues of accountability. For instance, to what extent are motorists and transportation planners of the 60s and 70s accountable for current climate change problems if the issue was not well known at that time, and is it fair to impose restrictions on societies who are still in an earlier phase of motorisation now that the effects are known?

## Causes of peoplés thinking about consequences of travel

Behavioral research offers several possible explanations of why people think less about the costs of travel for the society (and therefore indirectly for any individual including themselves belonging to the society as well as future generations) than they think about the benefits for themselves. An explanation, seemingly popular among the general public, is that people care less about societal costs because they are in general more concerned about their own well-being and the well-being of their close relatives than they are concerned about the well-being of unknown others. A second explanation is that people have less knowledge of societal consequences than of individual consequence. First, the societal consequences are more difficult to know about because they depend on the actions by many people, whereas the individual consequences are directly felt because they largely depend on individuals' own actions. Second, the societal consequences are more difficult to know about because many of them are deferred compared to the individual consequences that are more often immediate. Third, in contrast to the individual consequences, the societal consequences are more difficult to know about because many are global and not local such that they are directly encountered.

In the following we briefly discuss the two key explanations in relation to individual versus societal consequences, immediate versus deferred consequences, and local versus global consequences.

### *Individual vs. societal consequences*

In order to investigate factors that affect thinking of societal consequences compared to individual consequences, different research paradigms have been developed (Gärling et al., 2002). In the *Prisonefs Dilemma Game* (PDG) (Pruitt and Kimmel, 1977), two persons face a choice of cooperation or competition. If both either cooperate or compete, they will receive the same consequence. If one competes and the other cooperates, the former will receive a better consequence than the latter. The consequence is always better for the individual who chooses to compete. The dilemma is that if both do what is best for them individually (compete), the consequence for both will be worse than if both cooperate. In order to choose cooperation such that they both receive the joint best consequence, both need to be concerned about the consequence for the other and trust the other to cooperate.

A drawback with the PDG as a research paradigm for analyzing the salience of individual versus societal consequences is that it involves only two persons. It may therefore only apply to dyadic relationships (and to relationships between two groups, see Bornstein, 2008), but not to the relationships between individuals and the society. An extension of the PDG (the *N*-person PDG; see Komorita, 1976) has therefore been devised and used in research. Hardin (1968) referred to this extension as the "commons dilemma" that he argued is the root of current environmental problems, that is that many common resources such as material, energy, water, and air are free to overuse or pollute. Climate change, sustainability issues, and other so called "collective action" problems in societies have been modeled in this way (Ostrom, 1990). For this and related extensions, Dawes (1980) coined the

generic term "social dilemma" proposing the following defining features: (i) The consequences for each individual acting in their own interest (called defection) are better than the consequences for acting in the interest of the group (called cooperation), regardless of what other group members do, but (ii) all individuals are worse off if all defect than if all cooperate.

It is generally conjectured that cooperation in social dilemmas is contingent on how much weight people place on the different consequences of cooperate–cooperate, cooperate–defect, defect–cooperate or defect–defect. These weights reflect both how likely the consequences are believed to be and how attractive they are. Individual differences in social value orientation has been shown to influence the attractiveness of the consequences (Balliet et al., 2009). People who have a pro-self value orientation tend to place a higher weight on consequences for themselves, whereas people who have a pro-social value orientation either place a higher weight on the joint consequences or that the consequences are the same for everyone (Eek and Gärling, 2006; Van Lange, 1999). Pro-socials thus take into account both consequences for themselves and the collective (or society to which they belong), something which pro-selfs do not. Yet, pro-socials also take into account whether others do the same. Only if they belief others do, they will maintain their concern for the collective (Eek et al., 2002; Joireman et al., 2001; Van Vugt et al., 1995). It is therefore essential that measures are taken to convince pro-socials that others (at least a sufficiently large proportion) have the same concern for the society as they themselves have. Pro-selfs would not be similarly affected – they may even increase their rate of defection.

Several situational factors have also been identified that make almost everyone act in the interest of a group or society (see reviews by Kopelman et al., 2002; Ostrom, 1998). Sanctions, communication, and knowledge of and identification with the collective are the most important factors. As noted by Olson (1965), only the first two are however feasible to implement at a societal scale. The effectiveness of the third factor strongly decreases with the size of the collective.

### *Immediate vs. deferred consequences*

Social dilemmas do not formally include a time dimension. Yet, it has been shown in research on temporal discounting (Frederick, 2006; Frederick et al., 2002) that people place a higher weight on immediate positive consequences than on the same positive consequences if they are deferred. This is referred to as positive temporal discounting. Several context-specific explanations have been proposed that question whether positive temporal discounting reflects a pure time preference (e.g. impatience or lack of self-control) as was originally believed. It is also inconsistent with this view that the reverse tend be true for negative consequences, that is that temporal discounting in this case tends to be negative. Furthermore, everything else equal, a higher weight is placed on negative than on positive consequences (Kahneman and Tversky, 1979). This speaks to that under some circumstances long-term individual costs of travel would loom larger than immediate positive benefits for the individual. It appears as if pro-socials discount future losses less than pro-selfs do (Khachatryan et al., 2013) and are thus more likely to act to counteract long-term costs. A drawback is still that long-term consequences tend to be less known than short-term consequences. Informing people about future consequences is also made difficult by the fact that uncertainty is believed to and in general also increases with time.

### *Local vs. global consequences*

Local costs of travel including health-threatening effects of air pollution from cars, traffic noise, and traffic congestion are more easily felt than the global costs of contributing to the anthropogenic climate change (Weber, 2010; Weber and Stern, 2011). Markowitz and Shariff (2012) argue that an important factor is that climate change is not considered by people to be a moral issue because it is global, complex, and not caused intentionally. This implies a failure of feeling responsible. The reason may however not only be that knowledge of scientific facts is lacking but that people prioritize their own wellbeing and the wellbeing of their close relatives (which may be their own country). This is likely strengthened by selective attention to local events by the mass media.

### *Summary*

There are several reasons why people in general do not have as much knowledge of long-term societal costs as they have of individual benefits. In disseminating information these factors need to be considered. Yet, it is also evidence for that at least some people either filter out, deny or simply ignore information about long-term societal costs. These people may still be a minority and appear to be influenced by an informed majority who takes such information into account.

## Dissemination of research findings

Research results that clearly document the long-term societal costs of car travel may if accurately disseminated influence citizens to pay attention to such costs. However, research results are often preliminary, complex, and uncertain, making simplification necessary. Simplified dissemination increases in turn biases (Weingart et al., 2000), which impede acquisition of factual knowledge (Lewandowski et al., 2012). Disinformation is sometimes even deliberately made to discredit unpopular research findings (Oreskes and Conway, 2010).

Fig. 1 illustrates how information from primary and secondary documentation of research findings, conference presentations, and hearings are disseminated to the public from (1) politicians and government agencies, (2) mass media, (3) producers and sales organizations, and (4) other citizens acting as opinion leaders. In reality the process is likely to be less linear. The strengths of the influences (represented by solid versus broken arrows) may also vary. In the following each type of influence will be discussed.

### *Governments*

A primary receiver of research findings is governments who in general are also the main source of financial support for the research. Changes in structural conditions, rules/institutional conditions, economic incentives, and information are common means used by governments to reduce citizeńs car travel (Gärling and Schuitema, 2007).

The chosen measures aimed at changing car travel presumably influence how citizens evaluate long-term societal consequences. For this to occur, information about short-term and long-term consequences needs to be based on facts that are not misinterpreted. Unfortunately, politicians and governmental agencies do not always succeed in this. There are even examples of that they deliberately mislead citizens (Lewandowski et al., 2012). A general observation made by Weingart et al. (2000) is that politicians tend to reduce the complexities and uncertainties of scientific findings which may make the messages less alarming. In addition, governmental messages are frequently ambiguous because they make compromises between fiscal goals, goals of economic growth, and sustainable goals (Johansson et al., 2003; May et al., 2009). A likely outcome is that politicians and governmental agencies in the past

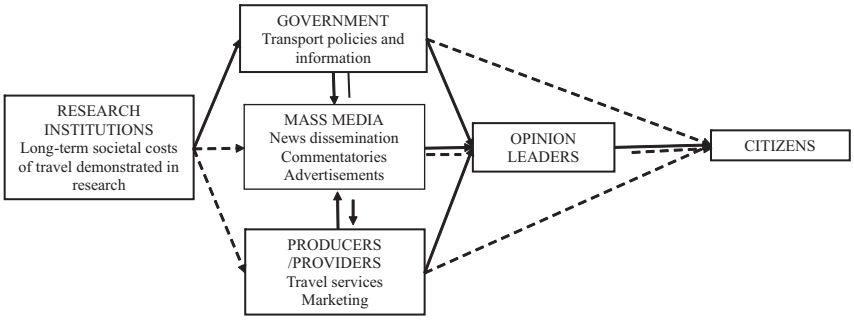


**Fig. 1.** Hypothetical model of how citizens acquire knowledge of long-term societal costs of travel from different sources disseminating information about these costs. (Solid arrows represent stronger influences than broken arrows).

have failed to adequately and objectively inform the public about long-term societal costs of car travel.

*Mass media*

Mass media exposure has been found to affect peoples' thoughts, feelings, and behaviors in a variety of domains (Fischer et al., 2011). In general, newspapers, radio, and TV all convey messages related to unsustainable travel obtained from governments, producers and providers of travel services, transport researchers, and organized groups of other people.

It is important for the mass media to give a comprehensive and balanced picture. Several studies have been undertaken of the mass media's objectivity in various fields such as politics (Bosman and d'Haenens, 2008), climate change (Boykoff and Boykoff, 2004, 2007), crime (Covert and Wasburn 2007), and war (Westerståhl, 1983). In reviewing this previous research, Ardiç et al. (2013) find that although the mass media generally act objectively, occasionally they do not and disseminate biased messages. The mass media have a responsibility to inform the public about long-term societal costs of car travel, but few studies have been conducted to show how they fulfill this responsibility. In contrast several studies have focused on the similar question of how the mass media inform about climate change. For instance, Weber and Stern (2011) conclude that mass media in the United States tend to frame stories dramatically (e.g., presenting alarms or extreme viewpoints) and to report "breaking" news stories. In line with this, Boykoff (2009) shows that the mass media coverage has contributed to misperceptions, misleading debates, and divergent understandings.

Governments implement various policy measures to reduce private car use (Fujii and Taniguchi, 2014). What effect these measures have on travel is in part determined by how people perceive the specific measures. In which ways the mass media inform about various measures (e.g., road pricing, congestion charging, car/fuel taxation) is therefore important and has been investigated. In the early 90s Norway implemented road pricing in several cities. Langemyr (1997) examined how Norwegian newspapers presented the type and form of equity arguments relating to congestion charging held by different stakeholders. The results showed no significant biases. In contrast, Ryley and Gjersoe (2006) found biased reporting by the mass media of the Edinburgh pricing proposal. This proposal was presented more negatively than positively except that information about the scheme design was neutral. Similarly, Vigar et al. (2011) found that the Manchester road pricing proposal was more negatively than positively presented although this varied among newspapers. In an analysis of over 1000 newspaper articles in Stockholm during the implementation of a field trial of congestion charges, Winslott-Hiselius et al. (2009) found that pre-trial articles were more neutral, primarily explaining the purposes and characteristics of the trial. Half-way through the trial, the articles became more positive. The majority of the post-trial articles were again more neutral. The variation was believed to depend on an increasing awareness of the consequences (for personal well-being) both in the mass media and among the general public. In analyzing the debate about the Dutch road-pricing policy, Ardiç et al. (2013) found that all the newspapers included in the study violated objectivity to the same degree, although initially adopting different policy positions which then were maintained over the relatively long period of the debate. Nygren et al. (2012) showed that the mass media discussion of a car tax reform in Finland 2008 was dominated by short-term impacts instead of longer-term perspectives. It was concluded that despite being relatively wide-ranging, the discussion contributed only marginally to public understanding of that car travel needs to become sustainable.

*Producers/Providers*

Producers and providers are obviously sensitive to customer demand. As a consequence, they advertise their services in a way intended to influence their presumptive customers' attitudes and preferences. In order to cater to some consumer segments, travel agencies have started to market ecological tourism – although it may be questioned whether anything than less tourism travel would be sustainable (Nawijn and Peeters, 2014). And marketing services is not always consistent with research showing what increases people's well-being (Jackson, 2009).

Are the activity by producers and providers in conflict with governmental goals? Government-promoted information campaigns, legislation, and infrastructure investments to promote road safety is an example of where the car producers are not consistently supporting the governmental goal when in conflict with their profit interests (Henriksson, 2011). Recently, car producers have still, partly forced by governmental regulations, started to target consumers' demand for cars making less damage to the environment (e.g., green technology, car2go, car sharing, and electrical vehicles). Yet, profit interests have counteracted successful implementations (Whiteman et al., 2011). As a solution, it has been suggested that initiatives from producers need to be made consistent with long-term plans proposed by national and local governments (Van den Bosch et al., 2005).

Local travel services including taxi and public transport (i.e., flexible transport services) are making less damage to the environment. Users of these services are also satisfied. Yet, its inherent flexibility is a problem for communication and visibility (Mageean and Nelson, 2003). Thus, the providers of these services need to market them differently (e.g., by means of journey plan-

ners) and to develop a brand making the service visible for the general public. While using "green" labels may have benefits as it has had in retailing groceries and other products (Björner et al., 2004), it may still not alone be sufficient.

*Opinion leaders*

Some citizens singly, informally or formally organized in groups, act as opinion leaders that are likely to have a direct influence on other citizens by filtering the messages from different sources (Hovland et al., 1953; Rogers, 2003). They primarily influence people by means of informal communication. Today, social media (e.g., Twitter, blogs/forums, Facebook, LinkedIn) are important tools for citizens to rapidly influence others.

It has been shown that travel-related issues are frequently visible in social media. An exploratory case study conducted in the UK (Gal-Tzur et al., 2014) showed that travel-related text messages included three main categories: expressing a need to travel from origin to destination, updating the current status of the transport network, and expressing an opinion about a travel service. Communication in social media is in general tuned to a specific receiver (e.g., others using the same travel mode) and since the sender is likely to have a high credibility (by being a current user of the transport system), the conveyed information may be believed to be more trustworthy than the same information from less credible sources (e.g., non-users or government). The importance of word-of-mouth from satisfied or non-satisfied users should thus not be underestimated (Brake et al., 2007; Oliver, 2010). Good or poor performance is frequently communicated to others – in general bad being disproportionately more frequent than good. Why do people share their experiences? Altruism (helping others, warning others, helping the company), harming the company (vengeance), and helping oneself (self-enhancement, anxiety or dissonance reduction, and advice seeking) are common drivers (Alexandrov et al., 2013). Trusted citizens can have a positive effect by making salient long-term societal costs of car travel, but various interest groups may also have a direct negative effect by highlighting individual benefits (Page et al., 1987).

## Summary and conclusions

Our main argument is that in a democratic society changing to sustainable travel behavior requires that the salience of the long-term societal costs of personal travel by cars is increased. To accomplish this, information about research findings documenting the long-term societal costs should be conveyed to citizens by governments, mass media, producers and providers of travel services, and opinion leaders. This is necessary because in contrast to the immediate individual benefits, the long-term societal costs are not directly felt and therefore not easily knowable. Thus, increasing knowledge is a key factor. Knowledge may however not be sufficient since another key factor is that people tend to be more concerned about their own and their close relatives' wellbeing than they are concerned about the wellbeing of unknown others. Filtering out, denying or simply ignoring information about societal costs are likely consequences. Yet, as we argue, some citizens (probably a majority) are concerned about others' wellbeing and will therefore, if they are adequately informed, act in the interest of the society. Others may be forced by the society to do this.

We have noted several possible pitfalls in the process of disseminating research findings about long-term societal costs of car travel. By doing so we hope to have increased awareness of these pitfalls as well as defining an agenda for research by transport and other (e.g. communication) researchers who are able to contribute to improving the dissemination process. Too few studies appear to have directly targeted dissemination of information about travel research findings, which may differ from the dissemination of other information, for instance about climate change. The strengths of the different types of influences of information about travel research findings should be assessed, and in order to identify obstacles to an appropriate dissemination, how information is distorted by each type of influence should likewise be assessed. The latter would require developing a benchmark of what is appropriate information for different segments of the general public.

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