Cover design: Melle Zijlstra
Laser cutting cover: Melle Zijlstra at FabLab Groningen
Printing: RCG Groningen

This research was carried out as part of the NWO/ Connect VEV project on 'A Multidisciplinary Study of Pricing Policies in Transport'; nr. 014-34-351. Financial support is gratefully acknowledged.

ISBN: 978-90-367-4487-4 (printed version)
ISBN: 978-90-367-4511-6 (electronic version)

GEERTJE SCHUITEMA

PRICELESS POLICIES

Factors influencing the acceptability of transport pricing policies

RIJKSUNIVERSITEIT GRONINGEN

Priceless policies
Factors influencing the acceptability of transport pricing policies

Proefschrift

ter verkrijging van het doctoraat in de
Gedrags- en Maatschappijwetenschappen
aan de Rijksuniversiteit Groningen
op gezag van de
Rector Magnificus, dr. F. Zwarts,
in het openbaar te verdedigen op
donderdag 9 september 2010
om 16.15 uur

door

Geertje Schuitema
geboren op 7 juli 1978
te Groningen

Promotor	:	Prof. dr. E.M. Steg
Beoordelingscommissie	:	Prof. dr. T. Gärling
		Prof. dr. G.P. van Wee
		Prof. dr. K.A. Brookhuis

Contents

FOREWORD 12

CHAPTER 1 GENERAL INTRODUCTION 15
- Introduction 16
- Background of this thesis 17
- Acceptability of transport pricing policies 20
- Outline of this thesis 26

CHAPTER 2 ACCEPTABILITY AND REVENUE USE
The role of revenue allocation for the acceptability of transport pricing policies 27
- Introduction 28
- Method 30
- Study 1: Acceptability of kilometre charge based on car weigh 31
- Study 2: Acceptability of flat kilometre charge 33
- Study 3: Acceptability of revenue allocations without reference to a specific policy 35
- General discussion 36

CHAPTER 3 ACCEPTABILITY AND EXPECTED EFFECTS
Relationship between the acceptability, personal outcome expectations and the expected effects of transport pricing policies 39
- Introduction 40
- Method 43
- Results 45
- Discussion 48

CHAPTER 4 ACCEPTABILITY AND PERCEIVED EFFECTS
Explaining differences in acceptability before and acceptance after the implementation of a congestion charge 53
- Introduction 54
- Method 60
- Results 63
- Discussion 65

CHAPTER 5 ACCEPTABILITY AND FAIRNESS
When are Transport Pricing Policies Fair and Acceptable? 69
- Introduction 70
- Method 76
- Results 78
- Discussion 80

CHAPTER 6 GENERAL DISCUSSION 83
- Introduction 84
- Compensating for negative consequences by revenue allocation 85
- Increasing efficiency 86
- Fair and acceptable distribution of policy outcomes 88
- Theoretical implications 89
- Methodological implications: scenario versus real-life studies 90
- Practical implications: guidelines for policy makers 91
- Final remarks 93

SUMMARY SAMENVATTING IN HET NEDERLANDS 95

REFERENCES 105

Foreword

haar (pronounced ***hahr***)

> A ***haar*** is a type of cold mist or fog from the North Sea, which frequently occurs along the East coast of Scotland.
>
> The word is of Dutch origin, coming either from Middle Dutch ***hare***, a biting wind, or Frisian harig, ***damp***.

Source: Scottish Dictionary, 2003

The *haar* is not an uncommon phenomenon outwith Scotland, but I'd never heard of it until I moved to Aberdeen. Let me expand a wee bit on my very first *haar* experience. The weather was magnificent during my first week at work: the sun shone, there was no wind and it must have been at least 20 degrees Celsius. I hardly enjoyed any of this glorious weather, as I did not want to give a bad impression during my first week. So, Friday 5.30pm I decided to go for a walk along the boulevard. It all started fine, but after I crossed King Street and headed for the sea, the *haar* entered land: compact clouds of fog rolled over the boulevard. Within 3 minutes I was entirely surrounded by a thick and very damp fog. All of a sudden, the other side of River Don had become invisible and temperatures must have dropped at least 7 degrees. I am sure that I could feel ice crystals piercing my skin. 'Wotterkôlle' was the only word that came to my mind – Groningers will know what I mean.

The *haar* reminds me of those periods that occur during every PhD: everything is going smoothly and according to plan, and then, all of a sudden, something goes terribly wrong - the *haar* has arrived. Particularly during those periods of a PhD you realise how important it is that you have people around you who support you. Lucky me, I had plenty of people around me – and I need to thank those who supported me.

First of all, I want to thank Charles Vlek and Talib Rothengatter. Unfortunately, both of you could not be part of the last phases of my PhD. Nevertheless, you taught me a lot about working in academia. Charles, thank you for all the time and effort you invested in me; Talib, I'll always regret that we didn't get the chance to discuss my second proposition.

Linda Steg is the only one who was there from the beginning 'til the end, which is an achievement in itself. Linda, your ceaseless optimism and confidence are very motivating. Frequent and very loud eruptions of laughter make working with you a joy; and working includes for me cycling to conferences, eating the enormous amounts of food you cook, and dragging around sand, paving stones and concrete bike racks.

My PhD was part of an interdisciplinary project. The collaboration during this project became my reference point for other collaborations; and that turns out to be a high standard. Erik, Bert,

Michiel, Dusica, Barry, Taede, and Dirk, thank you for the pleasant collaboration.

During my PhD I have worked in different places and departments. I began in Groningen at S&O and moved later to E&A (somehow a few 'E&A'ers' became 'S&O'ers' after I left – it's all too confusing!). Anyway, I'd like to mention Jan-Willem, Kees, Roos, Janet, Ebru, Berfu, Ellen, Martijn, Ben, Arjan, Karel, Dick, Ans, and Kyra. Every time I'm in Groningen you make me feel like I'm still part of the group – thank you! And Ans, by moving away I learned that what 'they' say is true: you are irreplaceable.

After E&A, I moved to Scotland, which turns out to be a good decision because I feel at home in this country. I realise that this is mainly due to my colleagues who made integrating very easy. Jillian, you make me feel at home because you laugh as much as Linda does; thank you for all your support in the past year. Thanks to everybody in The Maproom and St. Machar Bar – you make me forget that the *haar* exists! Paulus, I enjoyed our conversations over a glass of whiskey. Kate & Louise, I'm happy for the three of us that we are finished now! Angela & Marie, surfing, hill walking and camping trips in Scotland may be freezing cold, wet and usually involves gale-force winds, but that doesn't matter because you're there. And Angela, thanks for explaining the English (and Scottish) to me, cooking English breakfast (not to be confused with a Scottish breakfast), serving tea without milk, giving me a bed when I lock myself out, and all those hours in the Machar.

'They' also say that you make friends for life during your PhD – it turns out 'they' are right again. Wokje, Judith & Matthijs, despite the physical distance between us, you're my safety net. Thank you for all the times you have let me disturb you when I was in need of attention! Marieke & Jacqueline, thanks for sharing them with me.

My family, including in-laws, have always supported me in the background. Thanks for putting up with my bad moods and feeding me when necessary. Papa & mama, you're the ones who taught me how to put things in perspective – thank you for that extremely useful skill!

Judith & Roelof, lieve paranimfen, thank you for being there; it's a comforting thought that I have you around me. And Wokje, lieve schaduwparanimf, I'll miss you, but I know you'll be thinking about me, that is, after your first cup of coffee a few hours after my viva.

Mel, despite the fact that 1000 miles and a big pool of water temporarily separate us, you're the most important person in my life. But I won't thank you for that, because that's weird.

Having said all that let me finish my story about the *haar.* The *haar* meant the end of that glorious week and everything went back to normal: some bright and sunny spells, but also scattered showers, heavy at times, with south westerly winds and temperatures around 17 degrees. Which is not too bad, as they say up here. So, although the *haar* is a nasty thing, it will blow over and everything will be fine the day after. And to be completely honest, the *haar* doesn't occur that often: I've only seen it 4 times since I moved up here. Nevertheless, I've learned one important lesson: whenever the sun shines, get out of your office and enjoy - you never know when the *haar* arrives!

Geertje

Aberdeen, July 2010

Chapter 1
General introduction

Introduction

After many years of intense debate on transport pricing, the Dutch government recently decided to implement a national kilometre charge (see Box 1.1). Lorries will be charged from 2012 and, next, the charge will gradually be implemented for private cars[1]. During his presentation of the plans for the kilometre charge, the Dutch Minister of Transport declared that public support is one of the main premises for the kilometre charge. Indeed, public support appears to be crucial in this respect, because lack of public support hindered the implementation of transport pricing policies in the Netherlands during the last decades (Nationaal Platform Anders Betalen voor Mobiliteit, 2005). Similarly, in many other countries, transport pricing has hardly been implemented due to low acceptability levels (Jones, 1991a; 2003). Thus, public support is a very important precondition for the implementation of transport pricing policies. Therefore, the main objective of this thesis is to understand which factors influence the acceptability of transport pricing policies.

Politicians have some intuitive ideas on how to increase the acceptability of transport pricing. To illustrate, the Dutch Minister of Transport stressed three issues that may safeguard

Box 1.1. November 30, 2007: Announcement of a kilometre charge in the Netherlands

In a press conference at November 30, 2007, Camiel Eurlings, the Dutch Minister of Transport, announced that the Dutch Cabinet had reached the decision to implement a different system to pay for mobility. The new system implies that vehicle taxes and taxes on the purchase of new car are abolished. Instead, all car users have to pay per kilometre driven. The kilometre charge is budget neutral, meaning that on average costs for car users will not change. Compared to their current situation, those who drive more kilometres than average and during rush hours will pay more, and those who drive less than average and outside rush hours will pay less.

Quotes of The Dutch Minister of Transport during the press conference:

"This is a fair system, in which 8 million car owners do not pay for the possession of a car, but for the use of it."

"This is fair. The total tax burden for car users does not increase"

"Fairness, affordability and public support. I am proud that our decision meets these principles"

"How does this system reduce congestion? Very simple. We can design the system in such a way that car users pay a lower fee when few cars are on the road and on places where congestion hardly occurs. That makes it attractive to avoid busy and expensive hours"

"Experiences from abroad reveal that this system is effective in making car users choose carefully. The car user will consider: do I need the car and do I want to go by car, or do I choose alternative options?"

"Other countries have a system in which people pay for mobility, but the choice to implement such a system nationwide has never been made before in any country in the world. Also the fairness principle (you do not pay more, but in a different way) is unique"

"This decision implies that The Netherlands will stay mobile and environmental goals will be achieved"

Source: Dutch Ministry of Transport (2007). The text of the speech can be downloaded from http://www.verkeerenwaterstaat.nl/actueel/toespraken/perspresentatieandersbetalenvoormobiliteit.aspx (in Dutch)

acceptability in his presentation about the kilometre charge, that is, revenue use (viz., abolish car-related taxes), fairness (viz., the 'polluter pays principle'), and expected benefits (viz., reduced congestion in particular). Apparently, the Minister assumes that public support for the kilometre charge will be secured when he stresses that average costs for car users will remain the same, the charge is presented as a fair system, and congestion will decrease. Are these assumptions correct? Does allocating revenues to car drivers by reducing car-related taxes increase the acceptability of transport pricing policies? Does stressing that a kilometre charge will reduce congestion increase the acceptability of transport pricing policies? Is the kilometre charge perceived to be fair, and are fair policies more acceptable? Is 'the polluter pays' the most important fairness principle to secure the acceptability of transport pricing policies? These are the main questions that are addressed in this thesis.

This chapter starts with an outline of the background of this thesis. Facts and figures about car use are car ownership are given and strategies aimed at changing car use are outlined. Next, a theoretical framework of the acceptability of transport pricing policies is presented, and factors that affect the acceptability of transport pricing policies are discussed. Finally, an outline of the remaining chapters in this thesis is given.

Background of this thesis

Car transport: facts and figures

Worldwide, the number of cars has increased rapidly. In 1970, there were 200 million cars in the world, while in 2006 this number was over 850 million (Worldwatch Institute, 2006). The largest increase in numbers of cars per 1,000 inhabitants is noted in Western countries, such as New Zealand, Canada, the United States and European countries. Worldwide, the total number of kilometres driven in private vehicles has increased substantially as well (EMCT, 2006; OECD, 2001). For instance, in European countries, the number of passenger kilometres increased from 1,536 million kilometres in 1970 to 4,347 million kilometres in 2003 (EMCT, 2006). It is generally believed that both car ownership and car use will increase further in the future (WBCSD, 2004; OECD, 2008; see also, Vlek, 2007).

In the Netherlands, the growth in car use and car ownership is in line with the worldwide trend. The possession of cars in Netherlands has increased from 5,633 thousand cars in 1995 to 7,542 thousand cars in 2009 (see Figure 1.1), which implies an increase of 34%. Forty-four percent of the Dutch population owned a car in 2006. Most kilometres travelled were driven by car, either as a driver or a passenger (see Figure 1.2). Moreover, the number of kilometres travelled by car (13%) increased stronger than the amount of kilometres travelled with other modes of transportation (5%) between 1995 and 2006.

Strategies to change car use and car ownership: TDM Measures

Many hold the view that the current transportation system is not sustainable, and that policies are needed to regulate the negative impacts of car traffic (e.g., EU, 2003; OECD, 2001; UNEP, 2001). Technological innovations can effectively reduce various emissions, such as concentrations of particulate matter (Groot, 2001). However, many positive effects of technological innovations are counterbalanced by the increase in the possession and use of

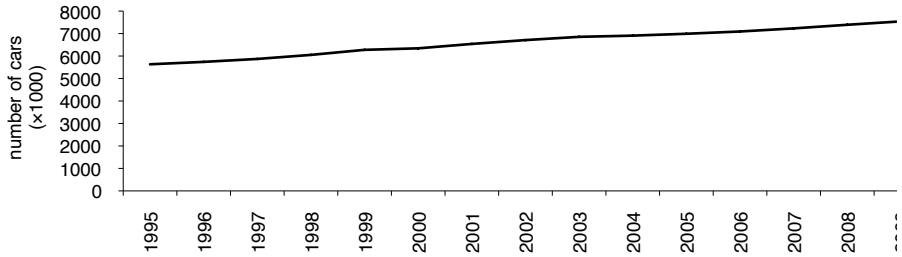

Figure 1.1 Number of cars in the Netherlands between 1995 and 2009
Source: AVV-MON, 2007; CBS, 2009

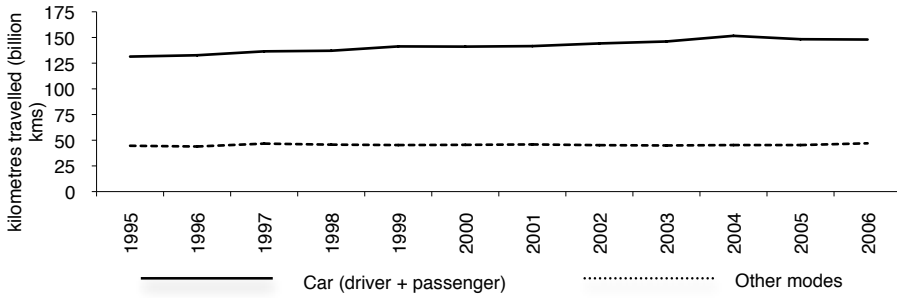

Figure 1.2 Total number of kilometres travelled in the Netherlands by car and other transport modes in 1995 – 2006
Source: AVV-MON, 2007

cars. Also, technological solutions do not necessarily reduce congestion levels or improve the accessibility of destinations. Therefore, policy measures that target the demand for car use are needed as well (e.g., Chapman, 2007; Johansson, 2009; OECD, 2001), often referred to as *travel demand management* (TDM) measures (Kitamura, Fujii, & Pas, 1997). Four types of TDM measures can be distinguished that target different antecedents of travel demand (Steg, 2003). These TDM measures involve either psychological or structural strategies for behaviour change.

Psychological strategies aim to change people's perceptions, knowledge, attitudes, beliefs, values, and norms concerning car use and car ownership. The underlying assumption is that when people change their perceptions and beliefs, they will adapt their car use and car ownership accordingly. Examples of psychological strategies are the provision of information about positive and negative aspects of car use, individualised marketing (providing people with tailored information about their travel options), social modelling (e.g., prominent public figures using alternative travel modes), and feedback on effects of behaviour changes.

TDM measures involving structural interventions are aimed at changing the context in which decision are made, in order to change the relative attractiveness of specific behaviours, such as car use or car ownership. On the one hand, structural changes can be aimed at making the desired behaviour more attractive (e.g., driving outside rush hours, purchasing an energy-efficient car); these are usually referred to as pull measures. On the other hand, undesired

behaviour can be made less attractive (e.g., driving during rush hours, purchasing an energy-inefficient car); such strategies are usually referred to as push measures (see also, Jones, 2003; Steg, 1996; Stradling, Meadows, & Beatty, 1999).

Structural interventions include physical changes, legal policies, and pricing policies. Physical changes are aimed at decreasing the relative attractiveness of car use and car ownership, for example by removing parking places, or constructing speed ramps (push measures), or by improving the infrastructure for public transport, walking and cycling (pull measures). The underlying assumption of physical changes is that people adapt their behaviour to changes in their physical environment.

Legal policies enforce certain behaviour, such as reducing car use or changing car ownership. Examples include the prohibition of car traffic in city centres, parking regulations (push measures), or giving cyclists right of way and allowing busses to drive on emergency lanes (pull measure). The assumption is that people will comply with these regulations. In addition, it is anticipated that in the longer term legal policies result in changes in social norms, which may also result in changes in car use and car ownership.

Pricing policies are aimed at making car use and car ownership relatively less attractive by increasing the costs for car ownership or car use. Also, pricing policies can be aimed at decreasing costs for travelling with other modes than car or by decreasing the costs for energy-efficient cars. Examples are congestion charges, road pricing, and taxation of fuels and cars (push measures), subsidising fares for public transport (pull measure) or energy-efficient cars. The underlying assumption of pricing policies is that people's travel choices depend on cost-benefit analyses of travel options, and that the financial costs are the prevailing factor in the cost-benefit analyses.

TDM measures differ in the extent to which they enforce people to change their behaviour, that is, the coerciveness of measures differs (Gärling & Schuitema, 2007). The coerciveness of TDM measures depends on the extent to which people are able to evade the measure. In general, push measure are considered to be more coercive than pull measures and push measures are also generally more effective in changing car use and car ownership. Of the push measures, transport pricing policies proved to be effective in changing car use (see Box 1.2). Consequently, in many countries, the implementation of transport pricing policies is considered, including China (Shanghai, 2008-2010), Denmark (Copenhagen, 2009), the Czech Republic (Prague, 2010), The Netherlands (2012) and New Zealand (Auckland, 2015-2020) (Commission for Integrated Transport, 2006).

The acceptability of transport pricing policies is generally low (e.g., Jones, 1991a; Jones, 2003; Schade & Schlag, 2003). To illustrate, in 2005, 75% of the inhabitants of Edinburgh rejected the implementation of a congestion charge in their city (Gaunt, Rye, & Allen, 2007). Also, in Manchester, public resistance was the main reason why a congestion charge was not implemented in 2006. So, acceptability is an important precondition for the implementation of transport pricing policies. This thesis focuses on factors that explain the acceptability of transport pricing policies. More specifically, the thesis will mainly focus on the acceptability of transport pricing policies that are aimed at increasing the costs of car ownership and car use.

Box 1.2. Examples of implemented transport pricing policies

Area license scheme in Singapore
In 1975, a licence scheme was implemented in Singapore. In 1998, the design of the scheme was changed so that motorised vehicles were charged when entering the city centre (between 7.30 a.m. and 7.00 p.m.) and on expressways (between 7.30 a.m. and 9.30 p.m.). A year after the introduction of the scheme in 1989, overall traffic volumes decreased by 15% during the entire day and with 16% during rush hours. Traffic volumes mainly decreased because people chose different routes, and, to a lesser extent, because of shifts from car to carpooling and bus use.

Source: Menon (2000), Santos, Li and Koh (2004)

Toll rings around Norwegian cities
In 1991, a tolling system was introduced on the ring road of Trondheim. Tolls were charged between 6.00 a.m. and 5.00 p.m. on weekdays. During peak hours, car traffic reduced by 10%. However, outside peak hours, car traffic increased by 8-9%. So, the toll ring around Trondheim mainly resulted in a shift in travel times. Similar to Trondheim, toll rings were implemented around Bergen (in 1986) and Oslo (in 1990). In these cities, the effects of the toll rings were rather small. In Bergen, estimations of reductions in inbound car trips varied between 3% and 7% twelve months after the toll ring was implemented. In the first year the Oslo toll ring operated, it was estimated that the number of cars crossing the toll ring reduced by 3 % to 10%.

Source: Larsen (1995), Merland (1995), Ramjerdi, Minken and Østmoe (2004), Tretvik (2003)

Congestion charge in London
In London, a congestion charge was implemented in 2003, which implied a daily charge of £5 for driving or parking on public roads within the central zone between 7.00 a.m. and 6.30 p.m., Monday to Friday. In 2005, the charge was raised to £8, and expanded to a larger area. A reduction of 16% in the total number of vehicles entering the city centre was observed between 2002 and 2006, while the number of cars entering the city centre decreased by 21%. Travellers mainly switched from car to busses, taxis, powered two-wheelers and bicycles. After the changes made in 2005, hardly any additional reductions in total traffic volumes or cars entering the central zone were observed.

Source: Santos (2004b), TfL (2006; 2007)

Congestion charge in Stockholm
In the first six months of 2006, a trial with a congestion charge was implemented in Stockholm. Between 6.30 a.m. and 6.30 p.m. motorised vehicles were charged when entering the city centre. The overall reduction in car traffic was about 22%. Car trips were mainly replaced by trips by public transport, bicycle or foot. After a referendum on the permanent implementation of the congestion charge, the Stockholm council decided to implement the congestion charge permanently in August 2007.

Source: Stockholmförsöket (2006)

Acceptability of transport pricing policies

Definition of acceptability

Acceptability of transport pricing policies has been defined as an attitude towards these policies (Bamberg & Rölle, 2003; Eriksson, Garvill, & Nordlund, 2006; 2008h; Jakobsson, Fujii, & Gärling, 2000; Schade & Schlag, 2003), which subsequently influences behaviour. Attitudes, and thus acceptability, reflect a psychological tendency that is expressed by evaluating a

particular entity (such as pricing policies) with some degree of favour or disfavour (Eagly & Chaiken, 1993; 2007). Attitudes are determined by a set of accessible beliefs, which reflect the subjective probability that an attitude object (e.g., a policy measure) has certain consequences (Ajzen, 1991c). These consequences can be negative (e.g., higher travel costs or reduction of freedom of choice) as well as positive (e.g., reduced congestion or improved environmental quality). Attitudes, and thus acceptability, can affect behaviour and the political decision making process to a large extent (Jones, 2003).

Theoretical framework to explain acceptability

Transport pricing policies can have positive as well as negative consequences for individuals and society. On an individual level, costs for car use probably increase people may decide to travel less by car or one's car use may be affected. On the other hand, society will benefit if these policies result in a reduction of car-related problems, such as congestion and environmental problems. Such societal gains can benefit individuals as well. For example, reductions in congestion may result in decreased travel times, and local air quality may improve when less people drive their car. As such, the acceptability of transport pricing policies can be described as a social dilemma. A social dilemma has two basic characteristics: (i) each individual is better off when they choose to defect (i.e., focus on individual outcomes), but (ii) all individuals are better off when everybody chooses to cooperate (i.e., focus on collective outcomes) (Dawes, 1980). With respect to the acceptability of transport pricing policies, choosing to defect implies that people evaluate transport pricing policies as unacceptable, because they do not want to give up the advantages of car use and do not want to pay higher prices for travelling by car. Choosing to cooperate implies that transport pricing policies are evaluated as acceptable, because this implies that people are willing to contribute to the reduction of car-related problems. People may choose to cooperate because of collective concerns, and as a consequence, all individuals are better off in the long term. Therefore, individuals may expect to benefit themselves from reduced car-related problems as well in the long term.

Studies on the acceptability of transport pricing policies revealed that the acceptability of these policies depends on two other factors besides the expected effects: revenue allocation and perceived fairness of transport pricing policies (Banister, 2008; Eriksson et al., 2006; 2008g; Bamberg & Rölle, 2003; Jakobsson et al., 2000; Ubbels, 2006). A theoretical framework that can be used to explain how and why these three factors are related to acceptability judgements is the Greed-Efficiency-Fairness (GEF) hypothesis (Wilke, 1991). The GEF-hypothesis states that in a social dilemma, people are *a-priori* greedy (G), that is, they want to maximise their own outcomes. Transport pricing policies will be evaluated as unacceptable when people expect their own interests to be negatively affected by these policies. The acceptability of transport pricing policies may increase when the negative outcomes of transport pricing policies for individuals are reduced or even removed. Therefore, compensating individuals for the negative consequences of transport pricing policies may increase the acceptability of these polices.

The GEF-Hypothesis states that people are not always greedy. People have the desire to use collective resources efficiently (E) as well, that is, they consider the interests of the collective. Hence, if people would focus more on the collective outcomes than on the individual

outcomes of transport pricing policies, acceptability levels are likely to increase. In large scale social dilemmas, the extent to which collective problems can be solved depends largely on the behaviour of others; car-related problems will only be solved when many people adapt their car use. In this respect, people's expectation about the behaviour of others (referred to as social uncertainty, Wilke, 1991; Yamagishi, 1986) is an important factor. If people expect that others do not act greedy too, the perceived effectiveness of policies will increase, and the acceptability of transport pricing policies will probably increase as well.

Finally, the GEF-Hypothesis states that people do not always act greedy, because they also have the desire to distribute outcomes fairly (F). This implies that acceptability levels of transport pricing policies will be higher if the outcomes of that policy are distributed fairly.

In sum, the acceptability of transport pricing policies can be enhanced in three different ways. First, individuals can be compensated for negative consequences of the policies. Second, the positive outcomes of the policy can be stressed. Third, costs and benefits of a policy should be distributed in a fair way. Below, we elaborate on these three ways to influence acceptability levels.

Compensating for negative consequences

When transport pricing policies are implemented, generally, the costs of private car use will increase or people reduce their car travel. In case people focus on individual outcomes rather than on collective outcomes of transport pricing policies, the acceptability of transport pricing policies is probably low, because increasing costs and car use reductions are usually perceived as disadvantageous for individual car users. Indeed, Jakobsson et al. (2000) found that the acceptability of transport pricing policies decreases when car users expect their own car use to be affected, because this was perceived as an infringement on their freedom. Consequently, acceptability is likely to increase when individuals are compensated for possible negative consequences of policies.

Revenues can be used to compensate car users for increases in travel costs (see also Box 1.1). It can be expected that the more car users benefit from the allocation of revenues, the more acceptable transport pricing policies are to them. Indeed, transport pricing policies appear to be more acceptable when revenues are allocated within rather than outside the transport domain (Schade & Schlag, 2000; Schlag & Schade, 2000). However, which specific type of revenue allocation within the transport system is the most acceptable is not clear. Some studies show that transport pricing policies are most acceptable when revenues are invested in public transport (Commission for Transport, 2004; Ison, 2000; Thorpe, 2002), while others reveal that allocation of revenues to reduce car-related taxes is most acceptable (Schade & Schlag, 2000), or that people most strongly favour investments of revenues in road infrastructure (Verhoef, 1996).

The contradicting results on which type of revenue allocation increases the acceptability of transport pricing policies most may be the result of the specific types of revenue allocations included in the studies or of different methods that were used. In some studies, respondents evaluated single types of revenue use without any reference to a specific transport policy (e.g., Verhoef, 1996), while in other studies packages of policies with different revenue allocations (e.g., Schade & Schlag, 2000) were evaluated. When single types of revenue allocation are evaluated, respondents evaluate the investment of revenues in general, probably without realising that this money is disposable because their costs for car use have increased. This may

result in unrealistic acceptability judgements, because respondents focus on the domain in which revenues are invested rather than on the total pricing policy, which includes a specific revenue allocation. When packages of transport policies are evaluated, acceptability judgements are confounded, because these packages often comprise multiple pricing policies and revenue allocations. Hence, when packages are examined, it is not clear which is the critical factor for acceptability.

In this thesis, we systematically examine the influence of revenue allocation on the acceptability of transport pricing policies (Chapter 2). First, we examine how the acceptability of two types of transport pricing policies is related to revenue hypothecation. We use an experimental approach: the evaluated policy measures are kept constant, while only revenue allocation is systematically varied. This approach enables us to draw conclusions on the causal relationship between revenue allocation and the acceptability of pricing policies. Second, the evaluation of single revenue allocations without a reference to a transport pricing policy is examined. As a result, we can compare the evaluation of revenue allocation with and without a reference to specific policy measure.

Increase efficiency

The GEF-Hypothesis states that people do not always act greedy. People also have the desire to preserve collective resources, such as environmental quality (reflecting 'efficiency'). Various studies suggest that people indeed consider collective interests as well as their own interests (see also, Lindenberg & Steg, 2007; Stern, 2000; Stern & Dietz, 1994). For example, recycling behaviour (Thøgersen, 1996), intention to donate to humanitarian and environmental organizations (De Groot & Steg, 2008), reducing meat consumption (Harland, Staats, & Wilke, 1999), willingness to reduce car use (Abrahamse, Steg, Gifford, & Vlek, 2009; Nordlund & Garvill, 2003), and mode choice for commuting trips (Van Vugt, Van Lange, & Meertens, 1996) appeared to be related to individual as well as collective interests. Also, transport pricing policies are more acceptable when people expect reductions in car-related problems, such as congestion and environmental problems (Gärling, Jakobsson, Loukopoulos, & Fujii, 2008; Rienstra, Rietveld, & Verhoef, 1999). On the other hand, if car users expect negative individual outcomes, such as a reduction of their own car use or increasing travel costs, transport pricing policies are evaluated as unacceptable (Jakobsson et al., 2000; Schuitema, Ubbels, Steg, & Verhoef, 2008).

As yet, the relative importance of the expected individual and collective outcomes for the acceptability of transport pricing policies has not been studied. That is, are acceptability and personal outcome expectations most strongly related to individual ('greed') or to collective outcomes ('efficiency') when they are evaluated in combination? In Chapter 3, we aim to fill this gap in the literature by studying the relative importance of the expected individual and collective outcomes of transport pricing policies for their acceptability. Moreover, we study how the expected individual and collective outcomes of transport pricing policies influence the extent to which people expect to feel better or worse off when these policies are implemented (reflecting 'personal outcome expectations'; cf., Schade & Schlag, 2003). We assume that acceptability and personal outcome expectations reflect both one's attitude towards transport pricing policies, consequently, we expect that both constructs are in a similar way influenced by the expected individual and collective outcomes of these policies.

It is likely that the outcomes of transport pricing policies are linked to the objectives of these

policies (for an overview of different objectives of transport pricing policies, see Verhoef, 2008). For example, environmental taxes on cars will probably reduce the environmental impact of cars, but will hardly affect congestion levels, while time dependent tolls will mainly affect congestion and hardly the environmental quality. Therefore, it can be expected that the acceptability of various policy measure is related to different expected outcomes, depending on the main objectives of a particular policy. In Chapter 3, we compare the relative importance of the expected individual and collective outcomes of transport pricing policies for policy measures with different objectives, that is, either mainly aimed at decreasing congestion or at decreasing environmental problems.

After pricing policies are implemented, people are able to observe the effects of pricing policies. Perceptions about the effects of the policies after they are implemented may differ from the initial expectations that people have. It has been argued that changes in perceptions of effects during their implementation of transport pricing policies result in changes in the acceptability of these policies. More specifically, many have argued that acceptability levels increase after the implementation of pricing policies because people experience their positive outcomes (e.g., Jaensirisak, Wardman, & May, 2005; Odeck & Bråthen, 1997; Odeck & Bråthen, 2002; Rienstra et al., 1999; Schade & Schlag, 2000; Schlag & Teubel, 1997; Stockholmförsöket, 2006; Tretvik, 2003; Winslott-Hiseliu, Brundell-Freij, Vagland, & Byström, 2008). However, empirical evidence to support this hypothesis is lacking. In Chapter 4, we examine if increases in acceptability of transport pricing policies can be explained by the experience of more positive effects or less negative effects of these policies during their implementation.

Fairness

The GEF-Hypothesis states that people also have a desire to distribute outcomes fairly (reflecting 'fairness'). The GEF-Hypothesis proposes that people prefer an equal distribution of the outcomes, that is, everybody should get an equal share (Wilke, 1991). However, other distributions of outcomes may be relevant as well (Steg & Schuitema, 2007). Costs and benefits may be distributed in different ways, and people may differ in their preferences for different types of distributions of costs and benefits. Little is know about which distribution of cost and benefits people prefer with respect to transport pricing policies. In Chapter 5, we examine the role of different types of policy outcome distributions (reflected by fairness principles) for the overall fairness and acceptability of transport pricing policies.

In general, people compare policy outcomes with a reference point (Kahneman, 1992a). Three different types of comparisons can be made, each based on a different reference point: intrapersonal, interpersonal and intergenerational comparisons. In Chapter 5, we identify six fairness principles that relevant in explaining the overall fairness and acceptability of transport pricing policies, based on intrapersonal, interpersonal and intergenerational comparisons.

Intrapersonal comparisons refer to a comparison of the individual outcomes of a policy with an internal reference level (e.g., one's current situation), independent of the outcomes of others (Loewenstein, Thompson, & Bazerman, 1989e). A fairness principle based on an intrapersonal comparison may concern the comparison of one's financial situation before and after the implementation of a policy measure.

Interpersonal comparisons imply that people compare the outcome of a policy for themselves with the outcomes of others after a policy is implemented (Loewenstein, Thompson,

& Bazerman, 1989d). Also, an interpersonal comparison may reflect a comparison of policy outcomes across individuals or groups in the population. Two important fairness principles that are used to evaluate the distribution of policy outcome across individuals or groups are equality (i.e, policies affect everybody equally) and equity (i.e., policies affect people in proportion to individual characteristics (e.g., income) or contributions (e.g., contributions to car-related problems) (e.g., Deutsch, 1975; 1985).

When intergenerational comparisons are made policy outcomes of others are considered in a broader context, that is, outcomes of policies for future generations are considered as well (Clayton, 2000; Wade-Benzoni, Hernandez, Medvec, & Messick, 2008c). The interests of future generation are protected when collective resources are preserved. Therefore, a fairness principle reflecting that nature, the environment and future generations are protected may be a relevant fairness principle for the evaluation of transport pricing policies as well (reflecting environmental justice).

Different policy measures have different costs and benefits, and consequently the overall fairness and acceptability of transport pricing policies may differ for various types of policies (e.g., Eriksson et al., 2006). We assume that differences in overall fairness and acceptability of transport pricing policies are due to the fact that these policies meet fairness principles differently. Thus, we assume that the same fairness principles predict overall fairness and acceptability of various transport pricing policies. To test this assumption and to test the robustness of our results, we examine in Chapter 5 how fairness principles are related to the overall fairness and acceptability of six different transport pricing policies. These six policy measures vary systematically on two characteristics that are assumed to be related to differences in overall fairness and acceptability. First, push measures (focusing on increasing costs for car use and car ownership) and pull measures (focusing on increasing benefits for car use and car ownership) are distinguished. Overall, push measures are evaluated as more coercive than pull measures, and as a result, push measures are generally considered to be less fair and acceptable than pull measures (e.g., Eriksson et al., 2006; 2008f; Gärling & Schuitema, 2007). Finally, a combination of push and pull measures may be considered to be more fair and acceptable than separate push or pull measures, because when push measures are combined with pull measures, problems may be solved, while alternatives are provided as well.

Second, we distinguish measures that aim to reduce the impact per car (focusing on fixed costs and benefits of car use and car ownership) and measures that aim to reduce car use (focusing on variable costs and benefits for car use and car ownership). Policies that aim to reduce the impact per car are generally evaluated as more acceptable than policies that aim to reduce car use, because the latter usually requires more effort and reduces people's freedom (Poortinga, Steg, Vlek, & Wiersma, 2003; Steg, Dreijerink, & Abrahamse, 2006).

The aim of Chapter 5 is threefold. First, different fairness principles that are potentially relevant for the overall fairness and acceptability of transport pricing policies are identified. Next, the relative importance of these fairness principles for the overall fairness and acceptability of transport pricing policies is examined. Also, we test whether the same fairness principles are relevant for overall fairness and acceptability of transport pricing policies that differ in overall fairness and acceptability.

Outline of this thesis

As yet, no theoretical framework has been identified to explain the acceptability of transport pricing policies. We proposed that the GEF-Hypothesis (Wilke, 1991) can explain which factors influence the acceptability of transport pricing policies. We argued that the acceptability of policies can be increased when people are compensated for the negative consequences of these policies (via revenue allocations of transport pricing policies), when the benefits of the policies are stressed (viz., the expected and perceived outcomes), and when the policies are believed to be fair. In the next four chapters, we present a series of studies in which we systematically examine how the acceptability of transport pricing policies is affected by these key factors.

Similar to other studies on the acceptability of transport pricing policies, we examine the role of these key factors for various transport pricing policies. The added value of our approach is that we systematically varied policy characteristics as to identify if and how the evaluation of pricing measures differed for various characteristics of the policy measures. For example, in Chapter 2 respondents evaluated transport pricing policies that systematically differed on revenue allocations only.

Most studies on the acceptability of transport pricing policies focus on hypothetical pricing policies, that is, scenarios of pricing measures are evaluated. This is a useful approach, because it helps to understand which factors affect the acceptability of policy measures before their implementation. In addition, it is also important to study the acceptability of policies measures that were actually implemented, especially because studies revealed that acceptability increases after the implementation of transport pricing policies (Odeck & Bråthen, 1997; 2002; Stockholmförsöket, 2006; Tretvik, 2003; Winslott-Hiseliu et al., 2008). In this thesis, we study how people evaluate hypothetical transport pricing policies as well as a policy that has actually been implemented, to examine why acceptability changes over time. In addition, we are able to compare both approaches.

The outline of this thesis is as follows. In Chapter 2, we examine the influence of revenue allocation on acceptability of transport pricing policies. In Chapter 3, the relationship between the expected individual and collective effects of transport pricing policies and their acceptability is studied. Chapter 4 reports a study in which differences in acceptability before and after the implementation of a congestion charge in Stockholm was examined. In addition, it is examined why these differences occur. Chapter 5 reports to what extent different fairness principles are related to the overall fairness and acceptability of transport pricing policies. Finally, in Chapter 6 the main results are discussed as well as their theoretical, methodological, and practical implications.

[1] Initially, lorries would be charged from 2011, but the implementation of the kilometre charge has been expanded with 8 months (Dutch Ministry of Transport, 2009). Recently, the Dutch government fell, and as a result, decisions about implementation of the kilometre charge are postponed until after the national elections in June 2010.

Chapter 2

Acceptability and revenue use

The role of revenue allocation for the acceptability of transport pricing policies

Abstract
Generally, pricing policies are believed to be effective in reducing problems of massive car use. However, pricing policies are not easily implemented, as they are hardly acceptable to the public. Studies indicate that revenue allocation is important for the acceptability of transport pricing. However, this has never systematically been examined. In the present study, revenue allocation is systematically examined, using between-subjects and within-subjects designs. Results revealed that transport pricing is more acceptable if revenues are allocated to the transport system instead of to general public funds. The between-subjects designs revealed that investing revenues in road infrastructure was hardly acceptable, while this type of revenue allocation was evaluated more favourably when following a within-subjects design. This suggests that the chosen design should dovetail with the aim of the study.

This chapter is published as:
Schuitema, G., & Steg, L. (2008). The role of revenue use in the acceptability of transport pricing policies. *Transportation Research Part F: Traffic Psychology and Behaviour, 11,* 221-231.

Introduction

In densely populated areas, increasing car use results in a reduction of accessibility (e.g. through congestion), quality of life (e.g. though noise) and environmentally quality (e.g. though CO_2-emmissions). Economists maintain that increasing the costs of car use is an effective strategy to reduce car use (Ubbels & Verhoef, 2007). However, the acceptability of such measures often is low (Jones, 2003).

The acceptability of transport pricing is assumed to depend on an evaluation of the expected outcomes of these policies, and is therefore defined as an attitude towards transport pricing (Bamberg & Rölle, 2003; Jones, 2003; Schade & Schlag, 2000). The design of a transport policy largely determines the outcomes of the policy for individual car users. One important feature for the acceptability of transport pricing is the allocation of the revenues (Jones, 1991a; Schlag & Schade, 2000; Schade & Schlag, 2003; Small, 1992).

A survey in Great Britain revealed that charges on driving in city centres and motorways were more acceptable if revenues were invested in public transport or used to reduce car-related taxes (Commission for Integrated Transport, 2001). In line with this, other British surveys concluded that investing revenues in public transport is the most acceptable revenue allocation, in particular when these investments were made in the area in which transport pricing was introduced (Ison, 2000; Jones, 1991a).

Schade & Schlag (2000) examined acceptability ratings of three packages of pricing policies in four European cities (see also, Schlag & Schade, 2000; Schade & Schlag, 2003). The revenue allocation was described in the policy packages, linking the revenues to a specific transport policy. Their results showed that these policy packages were acceptable if their revenues were allocated to public transport, conditions for pedestrians and cyclists, or used to lower car-related taxes. Investing revenues in general public funds or lowering income taxes were evaluated as less acceptable. Verhoef (1996) evaluated various types of revenue use without any reference to a specific transport policy, and found that a large majority of Dutch respondents preferred allocating revenues to road infrastructure. Reducing car-related taxes or investing in public transport was more acceptable than allocating revenues to general public funds. However, in a British survey only a minority of respondents favoured allocating revenues to increasing road capacity rather than to allocating revenues to public transport (Commission for Transport, 2004). Allocating revenues of Norwegian toll-rings to public transport was generally preferred over investments in road infrastructure (Thorpe, 2002). Different conditions of the Dutch, Norwegian and British transport system, in terms of number of travellers as well as the condition of public transport and road infrastructure, may be one explanation for these contrasting results. Moreover, Verhoef's sample consisted of morning peak road users, while the British and Norwegian survey was conducted among a representative sample of British adults and inhabitants of three specific cities, respectively.

In the studies above, respondents evaluated either total packages of transport policies including revenue allocation or single types of revenue use with or without any reference to a specific transport policy. When packages of transport policies are evaluated, acceptability is confounded with many other policy features, such as the price level. Moreover, the packages often consist of multiple pricing policies and revenue allocations. When single types of revenue allocation are evaluated, respondents evaluate the investment of revenues in general, without

realising that this money is disposable because their costs for car use have increased. This may result in unrealistic acceptability judgements, because the focus of respondents is on the domain in which revenues are invested rather than on the total pricing policy, which includes a specific revenue allocation.

So far, the role of revenue allocation in acceptability judgements of transport pricing has not been examined systematically. The aim of this paper is twofold. First, we examine to what extent revenue allocation influences the acceptability of transport policies. Second, we compare the evaluation of revenue allocations with and without a reference to specific transport policies.

Different types of revenues allocation may be categorised as follows (see Figure 1). First, revenues can be allocated within the transport system or outside the transport system (viz., to general public funds). Second, when investing revenues within the transport system, revenues can be used to benefit car users or users of alternative transportation modes, such as public transport or cycling. Third, when revenues are allocated to benefit car users, revenues can be used to reduce car taxes that are not related to car use (labelled as fixed costs, such as road taxes), reduce car-related taxes that depend on car use (labelled as variable costs, such as fuel taxes), or used to invest in road infrastructure. Moreover, revenues used to benefit users of alternative transportation modes can be categorised as: reducing costs that are not related (e.g., costs of seasonal tickets of public transport) or are related (e.g., public transport fares) to the frequency of using alternative modes, or invested in infrastructure (such as railways or cycle tracks). This categorisation lies beyond the scope of this paper and is therefore not included in Figure 2.1.

The acceptability of transport policies depends on the expected outcomes of the measure. Kahneman, Knetsch, & Thaler (1986a) demonstrated that people evaluate outcomes of situations in terms of gains and losses relative to their current situation. Most car users would probably consider the effects of transport pricing policies as a loss (i.e., their costs for car use increase). Cost increases can be compensated by returning the revenues to car users. It is expected that the more certain it is that car users are compensated, the more acceptable a transport pricing policy will be. People will feel more compensated when they perceive a direct link between their increasing costs on the one hand, and the compensation for these costs on the other (cf., Geller, 1989), which is the case in particular when revenues of transport policies are allocated to benefit car users. Based on this reasoning, for each level in Figure 2.1

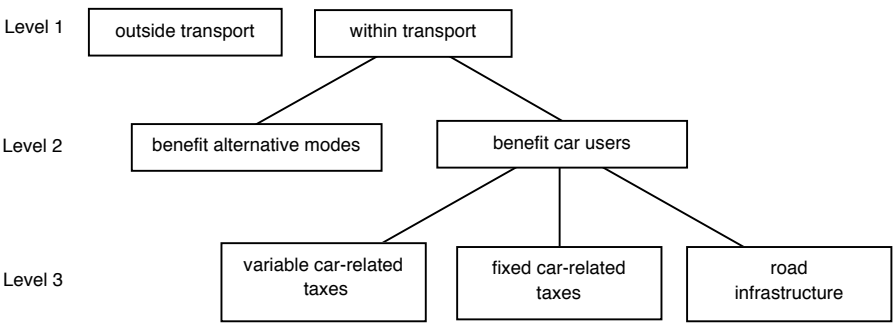

Figure 2.1 Classification of revenue allocations

hypotheses about the acceptability of transport policies are formulated for various revenue allocations.

First, it is hypothesised that car users evaluate the acceptability of transport pricing policies more favourably if revenues are allocated within the transport system, compared to outside the transport system. Whether and to which extent car users profit from revenues that are allocated outside the transport system depends on one's personal situation. For instance, healthy people do not profit from improved health care and unemployed people do not profit from decreased income taxes. If revenues are allocated within the transport system, car users are more sure that they will be compensated.

Second, if revenues of transport pricing are allocated to benefit car users, the latter are more directly compensated for their increasing costs than if revenues are allocated to benefit users of alternative transportation modes. Thus, it is hypothesised that transport pricing is more acceptable when revenues are allocated to benefit car users than users of alternative transportation modes.

Third, using revenues of transport pricing to benefit car users may imply decreases in fixed or variable costs or investments in road infrastructure. All car users will profit directly from decreased fixed or variable car-related taxes. So, these revenue allocations of transport pricing are expected to be most acceptable. Car users probably do not distinguish between the extent to which they are compensated for increasing costs if revenues are used to reduce fixed or variable car-related taxes. Therefore, we expect no differences in the acceptability judgements of these revenue allocations. When revenues of transport pricing policies are invested in road infrastructure, car users may be uncertain whether they will benefit personally from these investments as infrastructure may not be improved in the area in which they drive. Moreover, car users benefit only in the long term from investments in road infrastructure, whereas car users benefit directly from decreased car-related taxes. Thus, it is hypothesised that investing revenues in reducing (fixed or variable) car-related taxes is more acceptable than investing revenues in road infrastructure.

All hypotheses concern the acceptability of transport pricing by car users. Non-car users are more in favour of transport pricing than car users (Jaensirisak et al., 2005), because these measures do not increase their costs. However, this study focuses on car users, because this is a large and influential group with regard to the implementation of transport pricing policies.

Method

The first aim of this paper is to examine systematically to what extent the acceptability of transport pricing is affected by revenue allocation. To do so, two different kilometre charges in which revenue use was systematically varied were evaluated; between-subjects designs were followed. To make sure respondents evaluated revenue allocations with reference to specific pricing policies, realistic descriptions of the kilometre charges were presented to the respondents. Therefore, both kilometre charges were based on charges which the Dutch government seriously considers to implement.

Next, single revenue allocations without a reference to specific transport policies were evaluated by respondents; a within-subjects design was followed. In this case, various revenue allocations of transport policies in general were evaluated. This enabled us to compare evaluations of revenue allocations with and without reference to specific transport policies.

Data for this study were collected in one questionnaire study. To facilitate reading this paper, data are presented as three separate studies. The studies are presented in the same order as the respondents filled out the questionnaire.

Sample and procedure

The study was conducted by means of a computerised questionnaire. Respondents were selected from a telepanel of the Dutch marketing research institute TNS NIPO (Dutch Institute for Public Opinion and Market Research). Respondents were randomly selected from commuters who experienced at least twice a week congestion during the morning rush hour. Of the total sample, eight respondents were excluded from the analyses, because they filled out the questionnaire too quickly (viz., in less than 10 minutes; the average time used was 21 minutes), as a result of which 507 respondents were included in the analyses.

Compared to the Dutch average, the present sample comprised more male respondents (75%), with a high educational level (lower education was finished by 16.6%; 28.6% had finished middle education; 36.3% had finished higher education) and high gross household annual income (17.6% earned less than €28.500; 34% earned between €28.500 and €45.000; 29.8% earned between €45.000 and €68.000; 18.1% earned more than €68.000). This sample is comparable with other samples of commuters who are often confronted with traffic jams (Bureau Goudappel Coffeng, 1997; Steg, 2005).

Study 1: Acceptability of kilometre charge based on car weight

Method

First, respondents indicated the weight category of their car (light, medium, heavy). Next, respondents were presented with a description of a kilometre charge, implying that they had to pay for each kilometre driven by car. It was indicated that the price level was dependent on how environmentally friendly their car was, and that this was estimated on the basis of the weight of the car. People with a light car had to pay 4 €cents per kilometre driven, for medium-sized cars 5 €cents per kilometre, and for heavy cars 6 €cents per kilometre was charged. To give respondents an impression of the financial consequences of this measure, an estimation of the total cost increase for an average household was presented. For an average household (driving approximately 16,000 kilometres a year) costs per month could increase with €53 (for a light car), €66 (for a medium-sized car) or with €79 (for a heavy car)[1].

The description of the kilometre charge above was presented to all respondents, only the allocation of revenues varied systematically between respondents. Five types of revenue use were distinguished[2]: revenues could be allocated to (a) general public funds (N = 79), (b) transport system improvements (N = 82), (c) abolish road taxes (N=66), (d) decreasing fuel taxes (N = 69), and (g) new road constructions and improvement of existing road infrastructure (N = 69). Respondents were randomly assigned to one of the conditions[3]. After reading the scenario, the acceptability of this kilometre charge was indicated on a seven-point scale (1 -very unacceptable- to 7 -very acceptable-).

Results

Overall, the kilometre charge based on car weight was judged as rather unacceptable (M = 3.3, SD = 1.87). Table 2.1 gives an overview of the mean acceptability scores and standard deviations of the five conditions of revenue allocation. A one-way ANOVA was conducted, revealing a main effect for revenue use on the acceptability of the kilometre charge ($F(4, 360) = 5.98$, $p<.001$)[4].

Contrast tests revealed that the kilometre charge was less acceptable if revenues were allocated to general public funds compared to being allocated to the transport system in general (viz., the mean acceptability scores in the conditions when revenues were allocated to improve public transport, abolish road taxes, decrease fuel taxes and invested in road infrastructure). No statistically significant differences were found between the acceptability of the kilometre charge when revenues were used to improve public transport compared to when they were allocated to benefit the 'car user' (viz., the mean acceptability of revenues allocated to abolish road taxes, decrease fuel taxes and invested in road infrastructure). The kilometre charge was less

Table 2.1 Contrast tests of kilometre charge based on car weight for different types of revenue allocation

	Contrast	M	(SD)	value contrast	t (360)	p
1	revenues allocated to public funds	2.7	(1.62)	2.65	2.86	.004
	versus					
	transport system (viz., mean score on revenues allocated to public transport, road taxes, fuel taxes, road infrastructure)	3.4	(1.90)			
2	revenues allocated to public transport	3.2	(1.89)	0.90	1.27	.206
	versus					
	car user (viz., mean score on revenues allocated to road taxes, fuel taxes, road infrastructure)	3.5	(1.91)			
3	revenues allocated to road taxes	3.7	(1.93)	0.19	0.57	.553
	versus					
	fuel taxes	3.9	(1.88)			
4	revenues allocated to road taxes	3.7	(1.93)	-0.92	-2.93	.004
	versus					
	road infrastructure	2.8	(1.75)			
5	revenues allocated to fuel taxes	3.9	(1.88)	-1.10	-3.56	.001
	versus					
	road infrastructure	2.8	(1.75)			

Note: Acceptability varied from 1 (very unacceptable) to 7 (very acceptable)

Table 2.2 Contrast tests of kilometre charge based on car weight for different types of revenue allocation, without investing revenues in road infrastructure

	Contrast	M	(SD)	contrast value	t (360)	p
1	revenues allocated to public funds	2.7	(1.62)	2.58	3.60	.001
	versus					
	transport system (viz., mean score on revenues allocated to public transport, road taxes, fuel taxes)	3.6	(1.92)			
2	revenues allocated to public transport	3.2	(1.89)	1.27	2.51	.013
	versus					
	car user (viz., mean score on revenues allocated to road taxes, fuel taxes)	3.8	(1.90)			

Note: Acceptability varied from 1 (very unacceptable) to 7 (very acceptable)

acceptable if revenues were invested in road infrastructure compared to using them to abolish road taxes, or decrease fuel taxes. No significant difference was found between the acceptability of the kilometre charge when spending the revenues on abolishing road taxes and decreasing fuel taxes.

The low acceptability of the kilometre charge when allocating revenues to road infrastructure may explain the fact that no significant difference was found for the second contrast (viz., 'public transport' versus 'car user'). In fact, allocating revenues to improve road infrastructure was almost as unacceptable as allocating revenues to general public funds. Therefore, the first and second contrast analyses were conducted again, this time without allocating revenues to road infrastructure (see Table 2.2). As expected, two significant contrast effects were found. Again, respondents evaluated investing revenues in 'general public funds' as less acceptable than investing them in the 'transport system in general', that is, the mean acceptability scores of investing revenues to improve public transport, abolish road taxes, and decrease fuel taxes. In contrast to the previous contrast tests, the kilometre charge was less acceptable when revenues were used to improve public transport rather than when revenues were used to benefit the car user, that is, by abolishing road taxes and decreasing fuel taxes.

Discussion

In accordance with the first hypothesis, the kilometre charge was more acceptable when revenues were invested within the transport system than when revenues were allocated to public funds. Our second hypothesis was confirmed as well: the kilometre charge was more acceptable when revenues were allocated to benefit the car user rather than in case users of alternative transportation modes would benefit. However, this was only the case when allocating revenues to road infrastructure was not included. Third, no differences in the acceptability of the kilometre charge appeared when revenues were allocated to decreasing fixed taxes (viz. road taxes) or variable taxes (viz. fuel taxes). Finally, the kilometre charge was less acceptable when revenues were invested in road infrastructure compared to when revenues were used to reduce car-related taxes. In fact, investing revenues in road infrastructure appeared to be almost as unacceptable as allocating revenues to general public funds. This suggests that our assumption that investing revenues in road infrastructure would be perceived as a large benefit to car users was not validated. Apparently, car users expect hardly to benefit from investments in road infrastructure, which probably resulted in low acceptability levels. Moreover, the results support our reasoning in general: acceptability of kilometre charges increases when car users expect to benefit more directly from the revenue allocation.

Study 2: Acceptability of flat kilometre charge

Method

A description of a flat kilometre charge was evaluated by respondents, implying that everyone had to pay for each kilometre driven by car. A 3 (price level) by 3 (revenue use) between-subjects design was followed, implying 9 different versions of this kilometre charge (Table 2.3). Revenue allocations could either be (a) the government has not yet decided how to use the revenues, (b) revenues are used to construct new roads and improve existing road

Table 2.3 Design, average costs and number of respondents per condition for flat kilometre charge

		Revenues allocated to		
		(a) general public funds	(b) construct new and improve existing road infrastructure	(c) abolish road taxes and taxes on the purchase of cars
Price level (€cent/km)	2.5	a. h. c. increase: €33 per month (N=50)	a. h. c. increase: €33 per month (N=49)	a. h. c. decrease: €33 per month (N=60)
	5	a. h. c. increase: €66 per month (N=50)	a. h. c. increase: €66 per month (N=64)	a. h. c. increase: no change (N=56)
	7.5	a. h. c. increase: €99 per month (N=59)	a. h. c. increase: €99 per month (N=60)	a. h. c. increase: €33 per month (N=59)

a.h.c. = average household costs

Table 2.4 Contrast tests of flat kilometre charge for different types of revenue allocation

	Contrast	M	(SD)	contrast value	t (360)	p
1	revenues allocated to public funds	2.3	(1.54)	0.48	2.66	.008
	versus					
	road infrastructure	2.8	(1.62)			
2	revenues allocated to public funds	2.3	(1.54)	2.03	11.23	.001
	versus					
	reduce road taxes and taxes on purchase of cars	4.4	(1.78)			
3	revenues allocated to road infrastructure	2.8	(1.62)	1.55	8.75	.001
	versus					
	reduce road taxes and taxes on purchase of cars	4.4	(1.78)			

Note: Acceptability varied from 1 (very unacceptable) to 7 (very acceptable)

infrastructure, or (c) revenues are used to abolish road taxes and taxes on the purchase of cars. Further, the charge level was varied systematically: 2.5, 5 or 7.5 €cents per kilometre driven. Again, total costs per month for an average household were indicated (driving 16,000 kms a year). Average cost increases for an average household were estimated for each price level: 16,000 kms * price per km. In case allocating revenues was (a) the government has not yet decided or (b) construct new roads and improve existing road infrastructure, respondents were shown an estimation of costs increase per month for an average household, namely €33 (when charge was 2.5 €cent/km), €66 (when charge was 5 €cent/km) or €99 (when charge was 7.5 €cent/km). In case revenues were (c) allocated to abolish road taxes and taxes on the purchase of cars, a different estimation of the costs for an average household was shown to the respondents, because the reduction of costs by reduced car-related taxes was taken into account. Respondents read that monthly costs for an average household could decrease with €33 (when charge was 2.5 €cent/km), stay unchanged (when price level was 5 €cent/km) or increase with €33 (when price level was 7.5 €cent/km) (see Table 2.3).

Respondents were randomly assigned to one of the experimental conditions[5], and were asked to indicate how acceptable the policy scenario was to them on a 7-point scale (1 -very unacceptable- to 7 -very acceptable-).

Results

The average acceptability of the flat kilometre charge was 3.2 (SD = 1.87), which means that this measure was judged as rather unacceptable. An one-way ANOVA[6] revealed a main effect of revenue use on acceptability of the flat kilometre charge ($F(2, 504) = 70.1$, $p<.001$). Table 2.4 shows the results of the contrast tests conducted to examine the differences between the acceptability of the flat kilometre charge, given three types of revenue allocation. First, respondents evaluated the kilometre charge as less acceptable when revenues were used to improve general public funds compared to using revenues for improving road infrastructure. Second, the kilometre charge was less acceptable when revenues were allocated to general public funds, compared to when revenues were allocated to abolish road taxes and taxes on the purchase of a car. Finally, allocating the revenues of the kilometre charge to the latter was more acceptable than allocating revenues to road infrastructure.

Discussion

When revenues were invested in road infrastructure the kilometre charge was more acceptable than in case revenues were invested in general public funds. However, both investing revenues of a flat kilometre charge in road infrastructure and general public funds were rather unacceptable. Again, car users do not appear to expect to benefit from revenues allocated to road infrastructure. The flat kilometre charge was most acceptable when revenues were used to reduce car-related taxes, supporting our conclusion from Study 1 that acceptability of kilometre charging increases when car users expect to benefit more from the revenues.

Study 3: Acceptability of revenue allocations without reference to a specific policy

Method

Each respondent was asked to evaluate five different types of revenue allocation of transport pricing in general: “the government can allocate the revenues of transport policies in various ways. How acceptable are the following types of revenue allocation to you?”. The types evaluated were revenues allocated to (a) general public funds, (b) construct new roads, (c) improve the quality of public transport, (d) abolish existing road taxes, and (e) decrease existing fuel taxes. Scores could range from 1 (very unacceptable) to 7 (very acceptable).

Results

A repeated measures ANOVA was conducted to examine the acceptability of five types of

Table 2.5 Mean and standard deviation of acceptability judgments for 5 types of revenue allocations

Revenues allocated to	M	SD
General public funds	2.1	1.46
Improve public transport	4.0	1.93
Build new roads	5.2	1.43
Decrease fuel taxes	5.6	1.40
Abolish existing road taxes	5.8	1.22

Note: Acceptability varied from 1 (very unacceptable) to 7 (very acceptable)

revenue allocation without making any reference to a specific transport pricing policy. As Table 2.5 shows, allocating revenues of transport pricing policies to decrease fuel taxes, abolish road taxes and build new roads was judged far more acceptable than investing them in general public funds ($F(5, 502) = 392.3$, $p<.001$). Acceptability of revenue use to improve the quality of public transport took a middle position. Estimation of marginal means showed that average acceptability judgements of all types of revenue allocation differed significantly from each other ($p<.001$).

Discussion

Strikingly, investing revenues in road infrastructure appeared to be a very acceptable type of revenue allocation, which is in contrast to the results of Study 1 and 2. In Study 3, investing revenues in road infrastructure was almost as acceptable as reducing car-related taxes. We will elaborate on this finding in the general discussion, below.

In accordance with Study 1 and Study 2, the most unacceptable type of revenue allocation is investments in general public funds, while investing revenues in public transport took a middle position. Again, acceptability of transport pricing is higher when car users expect to benefit directly from revenue allocations (i.e., when car-related taxes are reduced) than when car users expect to benefit less directly from the revenue allocation (i.e., investments in general public funds).

General discussion

In three studies it was shown that the acceptability of transport pricing strongly depends on the allocation of revenues. Generally, results of three studies support our reasoning that acceptability of transport pricing increases when car users expect to benefit from the allocation of revenues, which is especially the case when revenues are allocated to decrease fixed car-taxes (viz., road taxes) and variable car-taxes (viz., fuel taxes). When revenues are allocated to benefit users of alternative transportation (viz., public transport) car users do not expect to benefit as much as when car-related taxes are decreased, but they expect to benefit more than when revenues are invested in general public funds. In Study 1 and 2, investing revenues to road infrastructure appeared to be almost as unacceptable as allocating them to general public funds, which suggests car users hardly expect to benefit from investing revenues in road infrastructure. Finally, car users expect to benefit least from revenues when they are allocated to general public funds. In this study, the revenue allocation outside the traffic domain was defined as ‘general public funds’ without a specification of the exact revenue allocation. This does not imply that only allocation of revenues outside the transport domain is not acceptable. In fact, transport pricing may be acceptable in case of specific revenue allocations outside the transport domain, for instance when revenues are invested in environmental improvements (e.g., see Jones, 1991a; Schlag & Schade, 2000).

The description of the kilometre charge in Study 1 was complex, and respondents may have had difficulties to comprehend all aspects of the charge. It cannot be concluded that the acceptability judgements were not affected by the comprehensibility of the scenarios since we do not have an indication of how well the respondents understood the scenarios. However, it seems not plausible to expect that respondents did not understand the scenarios well for two

reasons. First, in case respondents did not understand the scenarios, it may be expected that differences between groups would not be significant. Second, results of Study 1 were consistent with the results of Study 2, in which a rather simple scenario was presented to the respondents.

In addition, a price level depending on car weight may have been affecting respondents' perception of the fairness of this policy. For instance, this policy may be more fair to a car owner who possesses a light car than to a car owner with a heavy car. Because the acceptability of transport pricing increases when people perceive this policy as fair (Bamberg & Rölle, 2003; Jakobsson et al., 2000; see also Chapter 5 of this thesis), the perceived fairness of this kilometre charge may have played a role as well. However, in Study 2, the description of the flat kilometre charge was not complicated and the description gave less cause for variations in the perceived fairness of the policy. The results from Study 2 were in line with the evaluation of the kilometre charge in Study 1. Interestingly, the mean and variance of acceptability levels did not differ between the kilometre charge based on car weight and the flat kilometre charge. This suggests that differences in acceptability can be attributed to various revenue allocations rather than to the complexity or perceived fairness of the kilometre charge based on car weight.

In general, results from Study 3 were in accordance with the results of Study 1 and 2, with one exception. In Study 1 and 2 investing revenues in road infrastructure was judged as rather unacceptable, whereas in Study 3 this was a very acceptable type of revenue allocation. Results of Study 3 are in line with Verhoef's (1996) study, in which the same method was used. These contrasting results can be explained by the study designs that were used. Two factors may play a role. First, in Study 1 and 2 revenue allocations were linked to a specific pricing policy, whereas in Study 3 respondents evaluated revenue allocations without reference to actual pricing policies. In general, investing revenues in road infrastructure may be an acceptable allocation (Study 3), but when people realise that the money they are paying via transport policies is invested in road infrastructure, this revenue allocation may not be that acceptable after all (Study 1 and 2). In terms of Rawls (1999), respondents were situated behind a 'veil of ignorance': revenues were evaluated while respondents did not realise that transport pricing policies may affect their own situation. In Study 1 and 2, respondents were not ignorant of how kilometre charging would affect their own situation, and they probably considered these effects when evaluating the acceptability of the charges.

Second, in Study 3 respondents could compare single revenue allocations, because of the within-subjects design. This was not possible in Study 1 and 2, where between-subject designs were followed, which may result in different acceptability judgements. Similar results were found in a study on the acceptability of transport pricing among firms (Steg, Tillema, Van Wee, & Schuitema, 2008). Respondents first evaluated a kilometre charge where revenues were used to decrease income taxes. Next, they indicated how acceptable this kilometre charge would be if revenues were used in different ways (including decreasing income taxes), making comparisons between the revenue allocations possible. In the second task, revenues used to decrease income taxes were less acceptable than in the first task. Hendrickx and Nicolaij (2004) also found similar differences in responses between within- and between-subjects designs. They argue that for within-subjects designs task variations are more conspicuous than for between-subjects designs.

In conclusion, results of within-subjects designs do not always correspond to results of between-subjects designs. The choice of the design should be based on the purpose of the study. First, if the aim is to examine evaluations of a given type of revenue allocation in relation

to other types of revenues, making a reference to existing pricing policies is not necessary. If the aim is to examine evaluations of given types of revenue allocations in relation to the consequences of a policy as a whole, revenue allocations should be linked to a specific pricing policy. Second, when using a within-subjects design contrasts of revenue allocations are emphasised, whereas when using a between-subjects design isolated judgments of revenue allocations are given.

The acceptability of transport policies appeared to depend strongly on revenue allocation: acceptability increases when car users expect to be compensated for negative consequences. This is even more striking when considering the fact that our sample comprised commuters with high incomes, whose travelling expenses probably are (partly) refunded. As a result, the effect of transport pricing on this group of car users may actually be rather small. Nevertheless, the acceptability of transport pricing varied depending on revenue allocation, suggesting that when car users feel more compensated for possible negative consequences, in particular if car-related taxes are reduced, the acceptability of transport pricing increases.

This study provides additional evidence that the consequences of pricing policies should be clear for respondents when judging (aspects of) transport policies, because this affects people's judgements. In this case, investing revenues in road infrastructure appeared to be less acceptable when car users realised they had to pay themselves for these investments via kilometre charges. Furthermore, this study provides more insight in the way acceptability judgements of transport policies are formed, by systematically examining the role of revenue allocation in this process. It was shown that acceptability increases when car users expect to benefit from the allocation of revenues. This is important for communicating the implementation of transport policies to the public. By emphasising when and how car users can benefit from transport pricing, acceptability may increase (or decrease).

---

[1] Cost increases for an average household (driving 16,000 kms a year) were estimated for each weight category. For a small car (€0.04 per kilometre; 16,000 kms a year) costs increased with €640 a year, (≈ €53,- a month). For a medium-sized car (€0.05 per kilometre; 16,000 kms a year) costs increased with €800 a year (≈ €66,- a month). For a heavy car (€0.06 per kilometre; 16,000 kms a year) costs increased with €960 a year (≈ €79,- a month).

[2] In fact, seven revenue allocations corresponding to Figure 2.1 were included. Two categories covered more than one revenue allocation, that is, revenues allocated within the transport system and to benefit car users. These two categories were excluded from the analyses because they do not give insight in the evaluation of one specific type of revenue allocation.

[3] The seven groups were comparable on four socio-demographic features (i.e., sex, age, income and educational level) as well as on the length of their commuting trip.

[4] An one-way ANOVA was conducted, because this allowed us to examine the contrasts on which our hypotheses are based. These results were similar to the results of a two-way ANOVA: A main effect for revenue use was found ($F(4, 350) = 6.37$, $p<.001$). Acceptability did not depend on the perceived car weight ($F(2, 350) = 1.36$, $p=.26$) and there was no interaction effect ($F(8, 350) = 1.53$, $p=.15$). Since we do not focus on the relationship between car weight and acceptability, we will not elaborate on this.

[5] The nine groups were comparable on four socio-demographic features (i.e., sex, age, income and educational level) as well as on the length of their commuting trip.

[6] Again, an one-way ANOVA is reported to be able to examine the desired contrasts. Similar to the results of the one-way ANOVA, a two-way ANOVA revealed a main effect for revenue use ($F(2, 498) = 70.2$, $p<.001$). Moreover, a main effect for price level was found ($F2, 498) = 5.3$, $p<.05$): the flat kilometre charge was less acceptable the kilometre charge was 7.5 €cent/ km compared to 2.5 or 5 €cent/ km. No interaction effect was found ($F(4, 498) = .81$, $p=.52$). The effect of price level on acceptability is not described in detail, since it lies beyond the scope of this chapter.

Chapter 3

Acceptability and expected effects

Relationship between the acceptability, personal outcome expectations and the expected effects of transport pricing policies

Abstract
Acceptability and personal outcome expectations (i.e., the extent to which one expects to be better or worse off) of transport pricing policies were examined in relation to the expected effects of these policies on one's own car use, congestion and environmental problems. Car users who commuted frequently by car and experienced congestion on a regular basis evaluated two pricing measures, which were mainly aimed at either decreasing congestion (by tolling at congested areas) or environmental problems (by a differential kilometre charge based on car mass). For the policy mainly aimed to reduce congestion, acceptability was higher and personal outcome expectations were more positive when respondents expected reductions in congestion when the policy was implemented. The policy aimed to reduce environmental problems was more acceptable and respondents expected to be better off in general when they expected reductions in environmental problems after its implementation. Expectations, both about a decrease in congestion and environmental problems were related to respondents' personal outcome expectations of the policy mainly aimed to decrease environmental problems. We conclude that the acceptability of transport pricing policies are not necessarily low because car users expect negative effects on their car use, but rather because they are not be convinced that transport pricing policies will reduce congestion and environmental problems.

This chapter is based on:
Schuitema, G., Steg, L., & Rothengatter, J. A. (2009). The acceptability, personal outcome expectations, and expected effects of transport pricing policies. *Journal of Environmental Psychology, in press.*

Introduction

Private car use is associated with many individual advantages: car use is flexible, fast, convenient and comfortable. However, due to the increased ownership and use of cars, accessibility (e.g., congestion) and environmental problems (e.g., CO_2 emissions) have become more prevalent (OECD, 2001; Wee van, 2007). As a result, many argue that private car use and car ownership should be decreased (OECD, 1997; EU, 2003; UNEP, 1999; see also, Vlek, 2007).

Transport pricing policies aimed at increasing the financial costs of owning and using a car can be effective in reducing car use and car ownership (Santos, 2004a; Small & Gomez-Ibañez, 1998; Ubbels & Verhoef, 2007). Examples of transport pricing policies are kilometre charges, and congestion charges. Indeed, the congestion charge in London resulted in a decrease of 16% of the total number of vehicles entering the city centre between 2002 and 2006 (TfL, 2007; Santos, 2004b). The congestion charge in Stockholm resulted in an overall traffic reduction of 22% between January and August 2006 (Stockholmförsöket, 2006). However, potentially effective transport pricing policies are often not implemented because public support for these policies is low (Jones, 2003; Schade & Schlag, 2000). Therefore, understanding factors that affect the acceptability of transport pricing policies is an essential step towards a successful implementation of such policies.

This paper aims to examine factors that affect acceptability judgements of transport pricing policies. We define acceptability as an attitude towards transport pricing policies (cf., Bamberg & Rölle, 2003; Eriksson et al., 2006; 2008e; Jakobsson et al., 2000; Schade & Schlag, 2003). Attitudes reflect a psychological tendency that is expressed by evaluating a particular entity (such as pricing policies) with some degree of favour or disfavour (Eagly & Chaiken, 1993; 2007). Attitudes are determined by a set of accessible beliefs (Ajzen, 1991b; Eagly & Chaiken, 1998). Beliefs are the subjective probability that an attitude object (e.g., a policy measure) has certain outcomes (Ajzen, 1991a). Thus, the acceptability of transport pricing policies reflects the evaluation of the expected outcomes of these policies, and thus, the extent to which one expects to be generally better or worse off after the implementation of transport pricing policies (the latter is referred to as 'personal outcome expectations'; cf. Schade & Schlag, 2003). Those who mostly expect there to be disadvantages of transport pricing policies will find this policy unacceptable and have negative outcome expectations, whereas those who mostly foresee advantages will find this policy acceptable and have positive outcome expectations. In sum, we propose that the acceptability and personal outcome expectations are both indicators of one's attitude towards of transport pricing policies, and we assume that acceptability and personal outcome expectations of transport pricing policies are determined by the same beliefs about these policies.

Which outcomes are related to acceptability and personal outcome expectations of transport pricing policies?

Our main research interest is to examine which beliefs about pros and cons of transport pricing policies are related to the acceptability and personal outcome expectations of transport pricing policies. Transport pricing policies aim to make car use less attractive for individual car

users in order to reduce collective problems, such as congestion and environmental problems. Consequently, the acceptability and personal outcome expectations of transport pricing policies will depend on beliefs about the individual as well as collective outcomes of these policies. It is likely that transport pricing policies involve a conflict between individual and collective interests and as such reflect a social dilemma, that is, in order to decrease collective problems, individuals are faced with higher costs or infringements on their freedom (e.g., Garvill, 1999; Van Vugt, Meertens, & Van Lange, 1995; Van Vugt et al., 1996).

Literature on the acceptability of transport pricing policies indeed indicates that beliefs about individual and collective outcomes of transport pricing policies are important for the acceptability of these policies (e.g., Bamberg & Rölle, 2003; Eriksson et al., 2006; Gärling et al., 2008; Jakobsson et al., 2000; Schade & Schlag, 2003). On the one hand, car users may expect a decrease in their own car use when transport pricing policies are implemented, which is generally considered as an infringement on one's freedom (Jakobsson et al., 2000). If car users expect to reduce their own car use as a result of the implementation of transport pricing policies, they evaluate these policies as less acceptable (Jakobsson et al., 2000), and they probably will expect to be worse off in general, reflecting negative personal outcome expectations.

On the other hand, the acceptability of transport pricing policies appears to be related to the expected effects of these policies on car-related problems in society (Gärling et al., 2008; Rienstra et al., 1999). If people expect car use in general to decrease, they probably expect problems resulting from car use, such as congestion and environmental problems, to decrease as well. Reductions in car-related problems will not only benefit society as a whole, but individuals can benefit from it as well, for example when travel times or noise levels decrease. Consequently, if car users expect that transport pricing policies decrease car-related problems, acceptability levels may increase and people may also expect to be better off in general, reflecting positive personal outcome expectations.

To the authors' knowledge, the relative importance of the expected individual and collective outcomes has not been studied yet. That is, are acceptability and personal outcome expectations most strongly related to individual or to collective outcomes when they are evaluated in combination?

It is often assumed that people a priori serve their self-interests (Lindenberg & Steg, 2007; Moore & Loewenstein, 2004). The expected reductions in one's own car use typically reflects a focus on self-interest (Jakobsson et al., 2000). Hence, if car users indeed focus on their self-interest, it may be expected that the acceptability and personal outcome expectations mainly depends on the expected effects of transport pricing policies on one's own car use. However, social dilemma theory (Dawes, 1980) and goal framing theory (Lindenberg & Steg, 2007) suggest that people do not solely serve their self-interests, but consider collective interests as well. Indeed, several studies reveal that people consider collective outcomes to be important, next to individual outcomes (e.g., De Groot & Steg, 2008; Stern, 2000; Stern & Dietz, 1994; Thøgersen, 1996). This implies that both beliefs on individual and collective outcomes should predict the acceptability and personal outcome expectations of transport pricing policies. Reductions in congestion levels and environmental problems are generally perceived as positive outcomes for the collective (Joireman, Lasane, Bennett, Richards, & Solaimani, 2001; Joireman, Van Lange, & Van Vugt, 2004; Gärling, Fujii, Gärling, & Jakobsson, 2003), but individuals may also benefit when congestion decreases and environmental quality improves.

We aim to examine the relative importance of expected individual and collective outcomes of

transport pricing policies for their acceptability and personal outcome expectations. We included three beliefs that proved to be predictive of the acceptability of transport pricing policies (see above) and that vary in the extent to which they reflect egoistic and collective interests: the expected effects on one's own car use, congestion and environmental problems. Based on social dilemma theory (Dawes, 1980), goal framing theory (Lindenberg & Steg, 2007), and the studies discussed above, we assume that beliefs on individual and collective outcomes will both predict the acceptability and the personal outcome expectations of transport pricing policies. More specifically, we expect that the acceptability and personal outcome expectations of transport pricing policies are negatively related to beliefs about individual outcomes (i.e., the expected effects on one's own car use), and positively to beliefs on collective outcomes of these policies (i.e., the expected on congestion and environmental problems). As positive collective outcomes of transport pricing policies (i.e., expected reductions in congestion and environmental problems) may benefit the collective as well as individuals themselves, we expect that reductions in congestion and environmental problems are more strongly related to the acceptability and personal outcome expectations of policies than the expected effects on one's own car use.

Objectives of transport pricing policies and outcome expectations

The extent to which transport pricing policies are likely to reduce various car-related problems, such as congestion and environmental problems, differs across different types of policies, depending on the main objective of the particular policy (for an overview of different objectives of transport pricing policies, see Verhoef, 2008). People are likely to have a general idea about the objectives and consequences of different policies, even when the objectives of policy measures are not explicitly mentioned. For example, the implementation of tolls during rush hours is likely to be perceived by the public as a policy aimed at reducing congestion, while increasing levies for cars on the basis of emission levels is likely to be perceived as a policy aimed at improving environmental conditions. People take the extent to which they expect specific transport pricing policies to achieve their objectives into account when they evaluate the outcomes and acceptability of these policies (cf., Gaunt et al., 2007). Therefore, we expect that when a transport pricing policy mainly aims to decrease congestion, the acceptability and personal outcome expectations of this policy particularly depend on its expected effects on congestion. Similarly, when the main objective of a transport pricing policy is to decrease environmental problems, the acceptability and personal outcome expectations of this policy are likely to depend most strongly on its effects on environmental problems. To test this assumption, two policy measures that are linked to the beliefs we selected were include in this study. The first policy measure is a toll charge at specific bottlenecks on highways, which is mainly aimed at reducing congestion levels. The second policy is a differential kilometre charge related to car mass, which mainly aims to improve environmental quality.

Hypotheses

We tested three hypotheses. First, we assume that acceptability and personal outcome expectations are both indicators of one's attitude towards transport pricing policies. Hence, we hypothesise that acceptability and personal outcome expectations of transport pricing policies are positively correlated to each other (Hypothesis 1). Related to this, we expect that

acceptability judgements and personal outcome expectations of transport pricing policies are determined by the same beliefs about the expected outcomes of these policies. Therefore, we expect that beliefs on the expected effect of transport pricing policies on one's own car use, congestion and environmental problems predict their acceptability and personal outcomes expectations in a similar way.

Second, we hypothesise that the acceptability and personal outcomes expectations of transport pricing policies are determined by beliefs on expected collective and individual outcomes, and that acceptability and personal outcomes expectations are mainly determined by the expected effects on congestion and environmental problems (Hypothesis 2).

Third, we hypothesise that the acceptability and personal outcome expectations of the toll charge (mainly aimed at reducing congestion) depend most strongly on its expected effects on congestion, while the acceptability and personal outcome expectations of the car-mass-dependent kilometre charge (mainly aimed at improving the environmental quality) depend most strongly on its expected effects on environmental problems (Hypothesis 3).

Method

Respondents and procedure

As part of a multidisciplinary project, a questionnaire study was carried out among a panel of a Dutch market research institute. Respondents filled out a computerised questionnaire via the Internet. Eight cases were excluded from further analyses, because the time they used to fill out the questionnaire was unrealistically short and identical answers (over 75%) were given on crucial items. Analyses were conducted for the remaining 507 respondents.

This study focuses on a specific sample of car users, that is, commuters who experience congestion on a regular basis. These car users probably find transport pricing policies unacceptable, because they have a high annual mileage and thus are most likely to be affected by transport pricing policies (Jaensirisak et al., 2005). All respondents indicated in a pre-study conducted by the market research institute that they experienced congestion at least two times a week during the morning rush hour while commuting to work by car. On average, respondents commuted 4.7 days a week (SD = 0.74), of which they experienced congestion 3.6 days a week (SD = 1.15). The average respondent's commute (one way) was almost 50 kilometres (M = 46.7, SD = 34.49). Respondents with a relatively high income and education level were overrepresented, which is comparable to other samples of Dutch commuters (Steg, 2005).

Questionnaire

Respondents evaluated two pricing measures: (1) a toll charge at specific bottlenecks on Dutch highways and (2) a differential kilometre charge related to car mass. Four different scenarios were designed for the toll charge, and seven versions were designed for the kilometre charge. Below, we provide detailed descriptions of all versions of both pricing measures. Respondents first evaluated one version of the toll charge. The specific version was randomly generated by the computer. Next, participants evaluated a randomly generated version of the differential kilometre charge[1].

For both the toll charge and the kilometre charge, different scenarios were designed.

However, for this paper we are interested in studying how the expected effects of the toll charge on one's own car use, congestion and environmental problems were related to (overall) acceptability judgements and (overall) personal outcome expectations of the toll charge and car-mass-based kilometre charge. To do so, Box' M tests were used to test if it is valid to conduct analyses across the different scenarios of both policy measures. Box' M tests indicate the consistency of covariance across different scenarios, that is, the extent to which the relationship between dependent and independent variables is consistent. Homogenous covariance matrices imply that the relationship between the dependent and independent variables are similar for all scenarios, and thus that it is valid to conduct analyses across different scenarios.

Toll charge

The toll charge implied that every car user had to pay when passing specific structural bottlenecks on roads in The Netherlands. It was explained that toll costs would be additional to other costs of car use, and that the revenues would be used to build new roads and to improve existing roads.

The extent to which the toll charge was differentiated varied systematically, resulting in four versions of the toll charge. Each respondent evaluated one of these versions. The first scenario introduced a flat charge, which implied that all car users passing a specific bottleneck would have to pay €1.00 (N = 113). Second, a variable charge was described, implying that the charge for passing a bottleneck would be €2.00 during weekday rush hours (i.e., between 7.00 and 9.00 a.m. and 5.00 and 7.00 p.m.); during the remaining hours no toll would be charged (N = 147). Third, a more detailed variable charge was described. Again, car users had to pay during weekday rush hours, but this time price differed for various times during rush hours (N = 125) (see Table 3.1). Finally, a dynamic toll charge implied that the price level would depend on the degree of road congestion, varying from €0.00 (no congestion) to a maximum of €5.00 (high congestion level) (N = 122).

Box' M tests revealed homogeneity of covariance across the expected effects on one's own car use, congestion, environmental problems and the acceptability of the toll charge (F = 1.20, ns), as well as across the expected effects on one's own car use, congestion, environmental problems and personal outcome expectations (F = 1.41, ns). This implies that for all four versions of the toll charge, acceptability and personal outcome expectations correlated equally strong in the same direction to the expected effects on one's own car use, congestion and environmental problems. Therefore, we assume that it is appropriate to combine the data for all four versions of the toll charge.

Car-mass-dependent kilometre charge

The car-mass-dependent kilometre charge implied that every car user had to pay for each car kilometre driven. It was explained that the price level depended on car mass. Price levels for three weight categories were shown to all respondents: 4 €cents/km for a light car, 5 €cents/km for a car with an average weight, and 6 €cents/km for a heavy car. To make sure that the policy was clear to respondents, it was indicated that total costs for an average household (driving 16,000 kms a year) would increase by €53 per month (for a light car), €66 (for a car with average weight), or €79 (for a heavy car)[2].

The allocation of revenues was systematically varied, resulting in seven different versions of this kilometre charge: revenues could be (1) allocated to general public funds (N = 79), (2) used to improve the transport system in general (N = 74), (3) returned to car users (N = 68), (4) used

Table 3.1 Overview of pricing scheme of the third scenario of the toll charge

Charge level	Time of day	
	morning rush hour	evening rush hour
€0.50	6.00 – 7.00	16.00 – 17.00
€1.00	7.00 – 7.30	17.00 – 17.30
€1.75	7.30 – 8.00	17.30 – 18.00
€2.50	8.00 – 8.30	18.00 – 18.30
€1.75	8.30 – 9.00	18.30 – 19.00
€1.00	9.00 – 9.30	19.00 – 19.30
€0.50	9.30 – 10.00	19.30 – 20.00
no charge	9.30 – 10.00	20.00 – 6.00

to improve public transport (N = 82), (5) used to abolish road taxes (N = 66), (6) used to decrease fuel taxes (N = 69), or (7) used to build new and improve existing road infrastructure (N = 69). Respondents were randomly assigned to one of these seven versions of the kilometre charge.

Box' M tests revealed that the covariance matrices were homogeneous across the seven versions of the car-mass-dependent kilometre charge for the expected effects on own car use, congestion, environmental problems and acceptability (F = 1.11, ns) as well as for the expected effects on one's own car use, congestion, environmental problems and personal outcome expectations (F = .99, ns). Therefore, the relationships between acceptability and personal outcome expectations and the expected effects on own car use, congestion and environmental problems were similar for all seven versions of the car-mass-dependent kilometre charge. Hence, overall analyses could be conducted for the car-mass-dependent kilometre charge.

Measurement of dependent and independent variables

After reading the descriptions of the toll charge, respondents first indicated the expected effects of the pricing measures on: (1) their own car use (viz., how likely is it that you will decrease the number of kilometres you drive if this measure would be implemented?), (2) congestion (viz., how likely is it that congestion levels will decrease if this measure would be implemented?), and (3) environmental problems (viz., how likely is it that environmental problems will decrease if this measure would be implemented?). Scores could range from 1 (very unlikely) to 7 (very likely).

Next, the two dependent variables were measured. Respondents indicated their personal outcome expectations when the toll charge would be implemented (viz., if you consider all pros and cons of this measure, do you expect to be better or worse off if this measure would be implemented?), on a scale from 1 (considerably worse off) to 7 (considerably better off). Finally, respondents indicated how acceptable the toll charge was to them (viz., how acceptable is this policy measure to you?) on a scale from 1 (very unacceptable) to 7 (very acceptable).

After reading and evaluating the toll charge, respondents read the description of the car-mass-dependent kilometre charge and answered the same questions as they did for the toll charge.

Results

Toll charge

Paired t-tests indicated that the mean acceptability of the car-mass-dependent kilometre

charge was slightly higher than the acceptability of the toll charge, but no differences were found between the policy measures in terms of personal outcome expectations (see Table 3.2). If the car-mass-dependent kilometre charge was implemented, respondents expected their own car use and environmental problems to decrease somewhat more than if the toll charge was implemented. Congestion levels were expected to decrease more after the implementation of the toll charge as opposed to the car-mass-dependent kilometre charge.

As expected, we found a strong and positive correlation between acceptability levels and personal outcome expectations of the toll charge, indicating that the more respondents expected generally to be better off after the implementation of the toll charge, the more the charge would be acceptable to them ($r = .63$, $p<.001$). Furthermore, correlations showed that the acceptability of the toll charge was higher and personal outcome expectations were more positive when respondents expected congestion and environmental problems to decrease (see Figure 3.1a and 3.1b). Also, those who indicated that they would reduce their car use as a result of the toll charge found the charge more acceptable and had more positive personal outcome expectations[3]. In addition, respondents who expected that they would reduce their own car use expected congestion and environmental problems to decrease as well. Also, those who expected congestion levels to decrease expected a reduction of environmental problems too.

Two regression analyses were conducted to test how acceptability and personal outcome expectations of the toll charge were related to the expected effects of the charge on one's own car use, congestion and environmental problems. The expected effects of the toll charge on one's own car use, congestion and environmental problems explained 31% of the variance in acceptability judgements of this policy measure ($F (3, 503) = 73.9$, $p<.001$; Figure 3.1a). Both the expected effects on congestion and environmental problems contributed significantly to the explanation of respondents' acceptability judgements. Acceptability of the toll charge was higher when respondents expected congestion to decrease ($\beta = .42$, $p<.001$), and when they expected a reduction of environmental problems ($\beta = .22$, $p<.001$), albeit to a lesser extent. The expected effects on one's own car use did not significantly contribute to this regression model.

Thirty percent of the variance in personal outcome expectations was explained by the expected effects of the car-mass-dependent kilometre charge on one's own car use, congestion and environmental problems ($F (3, 503) = 71.1$, $p<.001$; Figure 3.1b). The pattern of the results was similar to the explanation of acceptability judgements of the toll charge. Personal outcome expectations were positively and significantly related to the expected effects of the toll charge on congestion ($\beta = .37$, $p<.001$) and environmental problems ($\beta = .16$, $p<.001$), but not to the expected effects of the toll charge on one's own car use.

Table 3.2. Mean scores and standard deviations for acceptability, expected personal outcomes and the expected effects on one's own car use, congestion and environmental problems of the toll charge and car-mass-dependent kilometre charge. Paired t-tests indicate the differences between the evaluations of the toll charge and car-mass-dependent kilometre charge

	toll charge	car-mass-dependent km charge	
	M (SD)	M (SD)	t (506)
Acceptability	2.9 (1.61)	3.3 (1.85)	-4.9 **
Personal outcome expectations	2.5 (1.33)	2.5 (1.37)	0.4
Expected effects on car use	2.5 (1.57)	2.7 (1.63)	-4.3 **
Expected effects on congestion	2.8 (1.55)	2.6 (1.45)	2.2 *
Expected effects on environmental problems	2.5 (1.42)	2.9 (1.58)	-5.4 **

Note. Scores could range from 1 (low) to 7 (high); paired t-tests are reported
*p<.05; ** p<.00

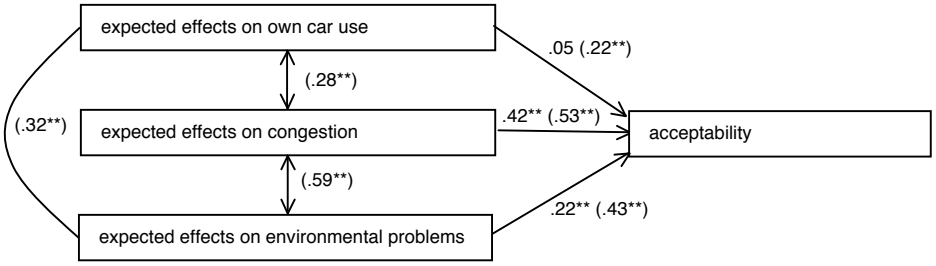

Figure 3.1a Regression analysis of expected effects on own car use, congestion and environmental problems on acceptability of toll charge (β coefficients). Bivariate correlations are given in brackets (** p<.001)

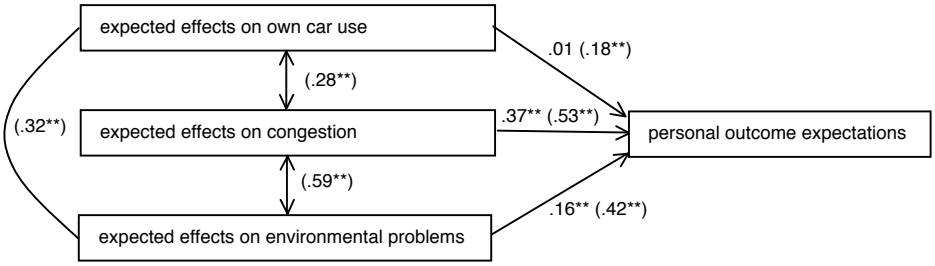

Figure 3.1b Regression analysis of expected effects on own car use, congestion and environmental problems on personal outcome expectations of toll charge (β coefficients). Bivariate correlations are given in brackets (*p<.05; ** p<.001)

Car-mass-dependent kilometre charge

As expected, a strong and positive correlation was found between the acceptability and personal outcome expectations of the car-mass-dependent kilometre charge (r = .68, p<.001). Bivariate correlations showed that the car-mass-dependent kilometre charge was more acceptable when respondents expected reductions in congestion and environmental problems (Figure 3.2a). Similarly, respondents had more positive personal outcome expectations when they believed that congestion and environmental problems would decrease (Figure 3.2b). Correlation coefficients showed that acceptability was somewhat higher and personal outcome expectations were slightly more positive when respondents expected a reduction in their own car use[4]. Similar to the toll charge, respondents who expected to reduce their own car use expected reductions in congestion and environmental problems as well. Those who expected decreased congestion levels also expected a decrease in environmental problems.

Twenty-four percent of the variance in acceptability of the car-mass-dependent kilometre charge was explained by the expected effects of this policy measure on one's own car use, congestion and environmental problems (F (3, 503) = 53.4, p<.001; Figure 3.2a). Only the expected effects on environmental problems contributed significantly to this model. The car-mass-dependent kilometre charge was more acceptable when respondents expected environmental problems to decrease (β = .60, p<.001).

The expected effects of the car-mass-dependent kilometre charge on one's own car use,

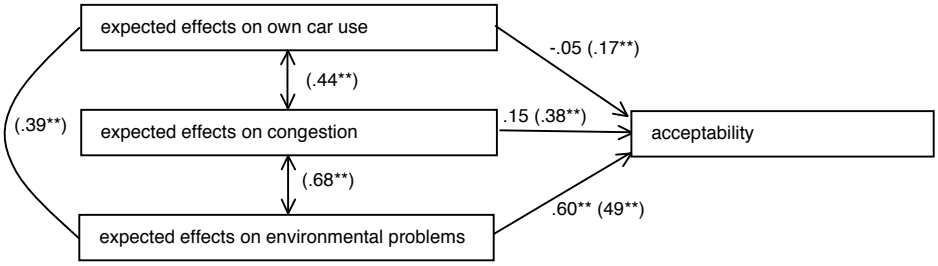

Figure 3.2a Regression analysis of expected effects on own car use, congestion and environmental problems on acceptability of car-mass-dependent kilometre charge (β coefficients). Bivariate correlations are given in brackets (** p<.001)

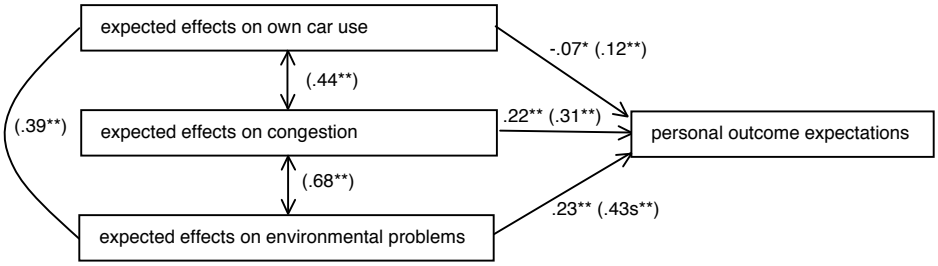

Figure 3.2b Regression analysis of expected effects on own car use, congestion and environmental problems on personal outcome expectations of car-mass-dependent kilometre charge (β coefficients). Bivariate correlations are given in brackets (* p<.05; ** p<.001)

congestion and environmental problems explained 22% of the variance in personal outcome expectations of this policy measure (F (3, 503) = 46.2, p<.001; Figure 3.2b). Respondents expected more positive personal outcomes when environmental problems (β = .23, p<.001) and congestion (β = .22, p<.001) were expected to decrease after the implementation of the car-mass-dependent kilometre charge. Moreover, respondents expected slightly more negative personal outcomes when they expected a decrease in their own car use as a result of the car-mass-dependent kilometre charge (β = -.07, p<.05).

Discussion

The aim of this paper was to examine to relative importance of the expected effects of two transport pricing policies on one's own car use, congestion and environmental problems for the acceptability and personal outcome expectations of these policies. First, we studied the relationship between the acceptability and personal outcome expectations. As expected, we found for both the toll charge and the car-mass-based kilometre charge a strong and positive correlation between acceptability and personal outcome expectations: the better off respondents expected to be after the implementation of the policy measures, the more acceptable they were to them. The strong and positive correlation between acceptability and personal outcome expectations supports our assumption that both constructs reflect an attitude towards transport pricing policies.

As expected, acceptability and personal outcome expectations depended on individual's beliefs of expected outcomes of transport pricing policies. In the case of the toll charge, acceptability and personal outcome expectations were most strongly predicted by the expected effects on congestion when the other beliefs on the expected effects were controlled for. For the car-mass-dependent kilometre charge, acceptability and personal outcome expectations were particularly related to the expected effects on environmental problems when the other beliefs on the expected effects were controlled for. In addition, personal outcome expectations of the car-mass-dependent kilometre charge were also related to the expected effects on congestion, and on one's own car use, although the latter relationship appeared to be very weak. Thus, as hypothesised, acceptability and personal outcome expectations depended most strongly on the extent to which respondents expected congestion and environmental problems to reduce. In contrast to our expectation, the expected effects on one's own car use hardly played a role in the evaluation of the two policy measures. This indicates that our respondents particularly considered a reduction of collective problems to be important, while expected individual outcomes did not play a significant role.

Bivariate correlations indicated that transport pricing policies were more acceptable and commuters expected to be slightly better off when they expect to reduce their own car use. These results are in contrast to results of Jakobsson et al. (2000), who found that the acceptability of transport pricing policies decreased when car users expected to reduce their own car use. Jakobsson et al. (2000) stressed that implementing transport pricing policies results in involuntarily behaviour change, which explains why acceptability decreases when car users expect reductions in their car use. However, car users may be willing to change their car use if they expect car-related problems to reduce. Consequently, they may be in favour of transport pricing policies because they expect these policies to help them to reduce their car use, and thus, to reduce collective problems (cf., Zlatev, Pahl, & White, 2010). Future studies should examine this explanation further.

Results revealed a similar pattern when looking at how the expected effects of both policy measures are related to personal outcome expectations and acceptability, again providing support for our assumption that personal outcome expectations and acceptability both reflect an attitude towards transport pricing policies. In case of the car-mass-dependent kilometre charge, personal outcome expectations depended on the expected effects on congestion and environmental problems, whereas its acceptability depended on the expected effects on environmental problems only. However, the correlations between acceptability and personal outcome expectations on the one hand, and the expected effects of this policy on the other hand were very similar, which supports our hypothesis. Also, as expected, the acceptability and personal outcome expectations were more strongly related to the expected effects on environmental problems than on the expected effects on congestion.

Considering that our sample consisted of commuters who experienced congestion on a regular basis, the results are striking. Previous studies showed that those who prefer to commute by car typically focus on their self-interests (Abrahamse et al., 2009; Van Vugt et al., 1996). However, our results indicate that besides self-interest, car commuters consider collective interests as well, such as environmental quality. Of course, we cannot generalise our results to Dutch car users or the Dutch population in general. Future studies are needed to examine to what extent our results can be replicated in other samples.

As in other studies, we used single items to measure the acceptability, personal outcome

expectations, and expected effects of pricing measures (Eriksson et al., 2006; 2008d; Schade & Schlag, 2003). In particular, the measurement of beliefs on the expected effects of transport pricing policies on environmental problems with single items has a drawback. On the basis of this study, we cannot pinpoint which specific environmental problems are relevant to car drivers, because we do not know which environmental problems respondents had in mind when they filled out the questionnaire. For example, respondents could have considered CO_2 emissions, particulate matter or smog levels. Moreover, people may have different opinions on various environmental problems, which we could not assess in this study. Future studies are needed to examine in more detail to what extent different types of environmental effects of transport pricing policies are related to the acceptability and personal outcome expectations of these policies.

Respondents evaluated various versions of toll charge and car-mass-dependent kilometre charge. Car users' acceptability levels and personal outcome expectations did not differ across the four versions of the toll charge. The seven versions of the car-mass-dependent kilometre charge were evaluated differently on acceptability and personal outcome expectations (see also, Schuitema & Steg, 2008: Chapter 2 of this thesis). However, Box' M tests clearly indicated that covariance matrices were consistent across seven versions of the car-mass-dependent kilometre charge, which indicates homogeneity of the relationship between the dependent and independent variables included in this study. In other words, acceptability and personal outcome expectations correlated equally strong and in the same direction to the expected effects on one's own car use, congestion and environmental problems for all versions of this policy measure, even though acceptability and personal outcome expectations differed for the seven versions of the car-mass-dependent kilometre charge. Therefore, it can be assumed that differences in the mean scores of acceptability and personal outcome expectations across versions of this policy measures did not affect our results.

Overall, the toll charge and car-mass-dependent kilometre charge had low acceptability levels, and respondents expected to be slightly worse off after their implementation. Also, respondents hardly expected their own car use, congestion and environmental problems to be affected by both policy measures. One may argue that the acceptability and personal outcome expectations of the policy measures were hardly related to the expected effects of one's own car use because people did not expect to change their own car in the first place. However, people also expected few changes in congestion and environmental problems, yet these factors were related to the acceptability and personal outcome expectations. This suggests that higher acceptability levels and more positive personal outcome expectations can be achieved when people expect reductions in car-related problems. Achieving this will be a major challenge, because people generally do not expect transport pricing policies to be effective. One strategy could be to first implement transport pricing policies in areas with serious car-related problems. In these areas, reductions in problems are most likely to be demonstrated, and if car users believe that a policy measure achieves its objective, it is deemed to be more acceptable. Consequently, the likelihood that, and to extent to which transport pricing policies achieve their objectives should be clearly communicated to the public before implementing transport pricing policies.

[1] An one-way Anova analyses showed that the acceptability and personal outcome expectations did not differ across the four versions of the toll charge ($F(3, 503) = 0.45$, $p = .72$; $F(3, 503) = 0.02$, $p = .99$, respectively). For the seven versions

of the car-mass-dependent kilometre charge, a significant main effect was found for the versions on acceptability ($F(6, 500) = 5.59$, $p < .001$) and on the personal outcome expectations ($F(6, 500) = 4.77$, $p < .001$). In this paper, we will not elaborate on the differences between the various versions per measure, because we are particularly interested in the relationships between acceptability and specific beliefs about the outcomes of the policy measures. The differences in acceptability judgments of the different versions of the car-mass-dependent kilometre charge are discussed elsewhere (Schuitema & Steg, 2008: Chapter 2 of this thesis)

[2] Cost increases for an average household (driving 16,000 kms a year) were estimated for each weight category. This implied that for a small car (€0.04 × 16,000 kms a year) costs would increase with €640 a year, (≈ €53,- a month). For a medium-sized car (€0.05 × 16,000 kms a year) costs would increase with €800 a year (≈ €66,- a month). For a heavy car (€0.06 × 16,000 kms a year) costs would increase with €960 a year (≈ €79,- a month).

[3] One could reason that especially car users with a negative attitude towards car use probably intent to reduce their car use (Ajzen, 1991d), and therefore, they may find pricing measure acceptable. This could explain the positive correlations between expected reductions in one's own car use and the acceptability and personal outcome expectations of the toll charge. We were able to test this explanation because in the questionnaire a measure of attitude towards car use was included as well (using four bipolar scales with items like 'car use is very pleasant/ unpleasant' on 7-point scales; $\alpha = .89$; $M = 5.5$; $SD = 1.1$). Attitudes towards car use were very weakly related to the expected effects of the toll charge on one's own car use ($r = .09$, $p < .001$), indicating that people's attitude towards car use is very weakly related to their beliefs about the consequences of the toll charge on their own car use. So, a negative attitude towards car use cannot explain that the toll charge is more acceptable and respondents expect to be generally better off (reflecting a positive personal outcome expectations) when they expect reductions in their own car use.

[4] As for the toll charge, the correlation between attitudes towards car use and the expected effects on one's own car use were calculated for the car-mass-dependent kilometre charge ($r = -.07$, ns). Again, this correlation indicated that the positive relationships between the expected effects on one's own car use on the one hand and the acceptability and personal outcome expectations of the car-mass-dependent kilometre charge on the other hand were not due to a negative attitude towards car use.

Chapter 4

Acceptability and perceived effects

Explaining differences in acceptability before and acceptance after the implementation of a congestion charge

Abstract

A field experiment was conducted in Stockholm where a congestion charge trial was introduced in 2006. Respondents completed a questionnaire before and after the trial. Acceptance of the congestion charge was higher after the trial as opposed to its acceptability judgments before the trial. Respondents believed the charge had more positive consequences (viz., decreasing parking problems, congestion, and pollution) and less negative consequences (viz., financial cost increases) after the trial than they had expected beforehand. Furthermore, we examined the relative importance of various beliefs for the acceptability of the congestion charge before and after it was implemented. Results are that before the implementation of the charge acceptability was significantly related to beliefs about the expected consequences for one's own car use and financial costs, whereas acceptance after the trial was related to beliefs about the perceived consequences for one's own car use and parking problems. These results indicate that acceptance of the congestion charge had increased because people experienced positive consequences of the charge. This conclusion is discussed in the broader context in which the Stockholm trial took place.

This chapter has been published as:
Schuitema, G., Steg, L., & Forward, S. (2010). Explaining differences in acceptability before and acceptance after the implementation of a congestion charge in Stockholm. *Transportation Research Part A: Policy and Practice, 44,* 99-109.

Introduction

In the past decades, car ownership and car use has increased rapidly (e.g., OECD, 2001). As a result, various car-related problems are manifested, in particular in urban areas, such as congestion, parking problems, noise hinder, and air pollution. Authorities try to find effective strategies to reduce these problems. Economists generally belief that road pricing, which is a specific type of transport pricing policies implying that car users are directly charged for using roads in general or for using particular roads or areas, is an effective strategy to reduce car-related problems (e.g., Small & Gomez-Ibañez, 1998; Ubbels & Verhoef, 2007). However, road pricing schemes are not easily accepted by the public (Jones, 1991a; 2003; Schade & Schlag, 2003), and hence not implemented on a large scale.

Despite low acceptability levels, road pricing schemes have been implemented in and around a few cities. A few studies examined differences in public support for road pricing schemes before and after their implementation. In the 1980s and 1990s, toll rings were implemented around some Norwegian cities, including the three largest cities in Norway: Oslo, Bergen and Trondheim. The acceptability of these toll rings increased during their implementation, although a year after the opening a majority still opposed to the toll rings in Bergen, Oslo and Trondheim (Odeck & Bråthen, 1997; Odeck & Bråthen, 2002; Tretvik, 2003). In 2003, the city council in London implemented a congestion charge around the London city centre. A majority of the Londoners supported the congestion charge a year after its implementation, while beforehand a majority opposed to the charge (TfL, 2004). Similarly to the London charge, a congestion charge was implemented in 2007 in Stockholm. Public support for this congestion charge increased during a seven-month trial period preceding the implementation of the charge (Stockholmförsöket, 2006; Winslott-Hiselius, Brundell-Freij, Vagland, & Byström, 2009d). So, there is some evidence that public support for road pricing schemes can increase after they are implemented.

However, public support for road pricing schemes does not always increase after their implementation. For example, in Copenhagen, Denmark, no differences were found in the acceptability of a toll charge before and after a transport pricing experiment (Gehlert & Nielsen, 2007). In Lyon, France, the local authorities and operator of an implemented toll scheme were forced to decrease toll levels significantly and to limit the tolling area, due to public resistance (Raux & Souche, 2004).

The studies described above examined changes in acceptability of road pricing schemes, but did not thoroughly and systematically examine factors that could explain why changes in acceptability did or did not occur. Many have proposed that the acceptability of road pricing increases over time if people experience positive effects of road pricing (e.g., Jaensirisak et al., 2005; Odeck & Bråthen, 1997; 2002; Rienstra et al., 1999; Schade & Schlag, 2000; Schlag & Teubel, 1997; Tretvik, 2003; Winslott-Hiselius, Brundell-Freij, Vagland, & Byström, 2009b), but empirical evidence is lacking. In this paper, we aim to examine if increasing public support for road pricing schemes can be explained by the experience of positive effects of these policies during its implementation, irrespective of the negative effects that people will experience as well. More specifically, we aim to examine factors that explain differences in public support before and after the congestion charge for traffic entering or leaving the city centre of Stockholm during a 7 months trial in 2006. Previous studies showed that the congestion charge in Stockholm was

more acceptable after the trial period than beforehand (Stockholmförsöket, 2006; Winslott-Hiselius, Brundell-Freij, Vagland, & Byström, 2009c). In this study we aim to understand why public support increased during the trial period of the congestion charge in Stockholm.

The Stockholm trial

Design of the Stockholm trial

In 2007, the national government in Sweden decided to permanently implement a national congestion tax in Stockholm. Preceding this decision, a full-scale trial was conducted in Stockholm from January 3 till the July 31 2006 (Vägverket, 2006). The charge was constructed as a national (congestion) tax. A municipal tax was not possible for legal reasons. In the remaining of this paper we refer to the full trial as 'the congestion charge'. Officially, the main objective of the congestion charge was threefold: a reduction in congestion, increase in accessibility and improvements in environmental quality (see, Stockholmförsöket, 2005; 2006).

During the trial, motorised vehicles were charged each time they passed a charging point (either entering or leaving the city centre), with the exception of evenings, nights, Saturdays, Sundays, public holidays, and the day before a public holiday. The charge was differentiated to time of the day. Table 4.1 provides an overview of the charge level. Some vehicles were excluded form the charge, such as motorcycles, taxis, emergency vehicles, and vehicles using fuel with low emission levels (for a complete overview see Vägverket, 2006).

The city of Stockholm is built on 14 islands, which are connected via bridges. Eighteen control points were built where all passing traffic was registered (see Figure 4.1). To enable register vehicles two methods were used; number plates were photographed (both front and rear) or laser detection for on board vehicle detection. The charge could be paid via automatic direct debit, via the Internet (either by credit card, charge cards or Internet banking), at banks, or cash at some shops and kiosks. Direct payment at the control points was not possible. Automatic payment was the most common payment method.

As part of the Stockholm trial, public transport was extended (primarily implying more busses and bus stops) from October 2005. Public transport was running more frequently, mainly during rush hours, 16 new bus lines to the city centre and 14 new express busses were introduced. In addition, 1,500 additional parking places were created near stations.

Table 4.1. Overview of charge level at specific time of the day

Time of day		Charge
from	till	
06.30	06.59	10 SEK[a]
07.00	07.29	15 SEK
07.30	08.29	20 SEK
08.30	08.59	15 SEK
09.00	15.29	10 SEK
15.30	15.59	15 SEK
16.00	17.29	20 SEK
17.30	17.59	15 SEK
18.00	18.29	10 SEK
18.30	06.29	0 SEK
Maximum charge: 60 SEK per day per vehicle		

[a] SEK = Swedish crown; 1 SEK ≈ 0.11 Euro (January 2006)

Source: Stockholmförsöket, 2005

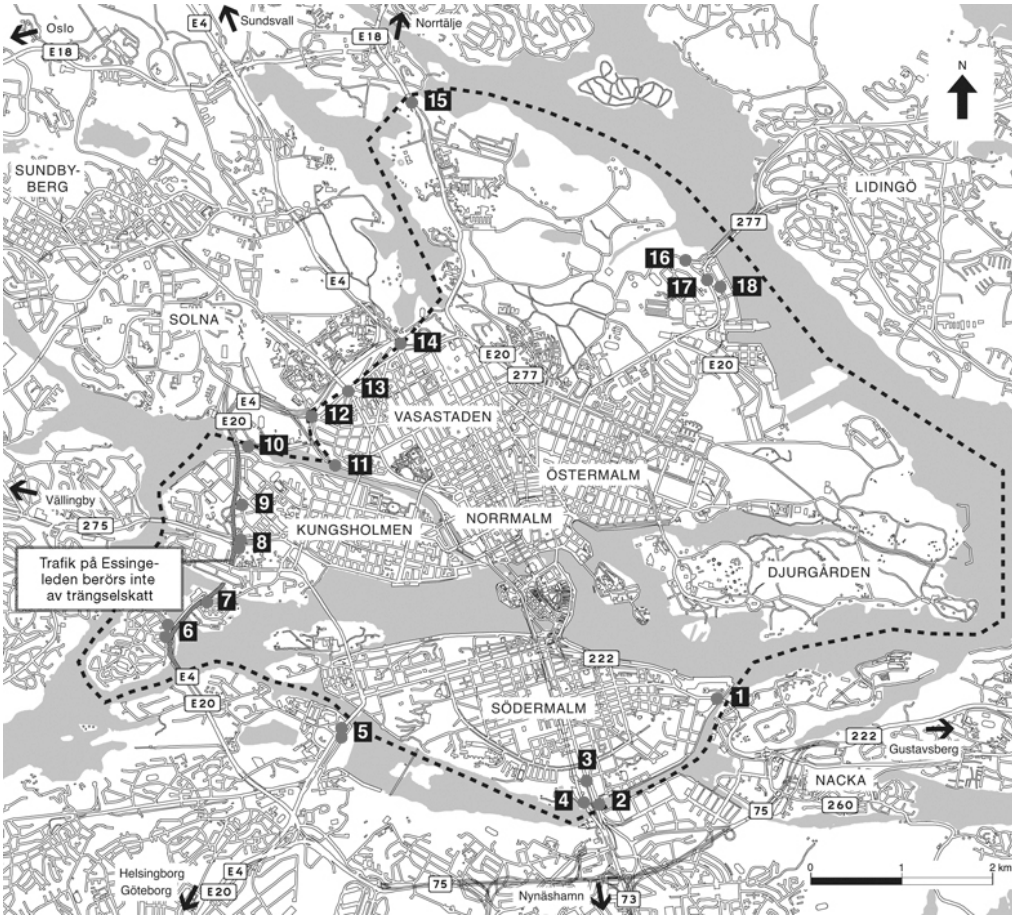

Figure 4.1 Stockholm's congestion charge zone, the numbers refer to 18 control points
Source: www.stockholmsforsoket.se

The Stockholm Council aimed to communicate the congestion charge widely to the public (Vägverket, 2006). To achieve this objective, information was provided by means of flyers, posters, meetings, signs on busses and parking meters, letters, meetings (e.g., in shopping centres), and commercials on radio and television. In addition, information was provided on a website, and a customer service was available for all questions. Also, monthly reports were published on-line presenting changes in car use and other transportation modes, congestion, and the general attitude towards the congestion charge (see also, Gudmundsson, Ericsson, Hugosson, & Rosqvist, 2009).

Context of the Stockholm trial

A long and intense debate preceded the Stockholm trial, starting in the 1970s. In 1992, a final agreement on a package of measures to control car traffic in Stockholm, the so-called 'Dennis Package', was made between three political parties, that is the Social Democrats, the

Conservatives and the Liberal party. However, this plan was never realised. The Dennis Package collapsed in 1997, mainly due to lack of public support and unstable political agreements (Ahlstrand, 1998; 2001). Five years later, a new agreement was made on transport pricing in Stockholm. The Social Democratic government and their supporting parties, the Left Party and the Green Party, agreed on a congestion charge trial shortly after the elections in 2002. However, the start of the trial was yet again, delayed due to a court appeal related to which contractor to use for the technical system. Eventually, the trial started on January 3, 2006.

After the agreement in 2002, the role of the Social Democrats was the topic of intense debate. Preceding the elections, the Social Democrats had stated that they would not implement road tolls, that is, taxes on the use of specified (parts of) roads. However, in order to be able to form a coalition with The Green Party, they agreed on the congestion tax. This lead to strong negative reactions from the public and in the media (Isaksson & Richardson, 2009b), which affected the general opinion on the congestion negatively for a long time. The general opinion of the public and in the media remained negative until the start of the trial in 2006. However, during the trial, both the media as the public became more positive about the congestion charge (Winslott-Hiselius, Brundell-Freij, Vagland, & Byström, 2009a). Shortly after the trial had finished, general elections took place in Sweden at September 17, 2006. At the same day, a referendum was held among inhabitants of Stockholm city and of inhabitants of 15 out of the 25 municipalities of the county of Stockholm. People living in Stockholm city and the municipalities of the County of Stockholm could vote 'yes' or 'no' to making the congestion charge permanent. With regard to the municipalities it was up to each one to decide whether or not they were going to take part in the referendum. In addition, the inhabitants of Stockholm city only, could indicate 'yes' or 'blank' to some extra statements (i.e., concerning the allocation of revenues). A small majority, 51.3%, of the inhabitants of Stockholm city voted 'yes' at the referendum and 45.5% voted 'no'. A minority (39.8%) of the people living in municipalities of the county of Stockholm voted in favour of the congestion charge, while here 60.2% voted 'no' (for further information see www.stockholmsforsoket.se). After the referendum, the Swedish parliament agreed on the permanent implementation of the congestion charge. On August 1, 2007, the congestion charge was re-introduced in Stockholm city.

Acceptability and acceptance judgements

Both acceptability and acceptance of road pricing schemes reflect an attitude towards these schemes (e.g., Bamberg & Rölle, 2003; Eriksson et al., 2006, 2008; Gärling et al., 2008; Jakobsson et al., 2000; Schade & Schlag, 2000). Attitudes are a psychological tendency that is expressed by evaluating a particular entity (such as road pricing schemes), with some degree of favour or disfavour (Eagly and Chaiken, 1993, 2007). The difference is that acceptability refers to the attitude on road pricing schemes before their implementation, whereas acceptance refers to the attitude on road pricing schemes after their implementation (Gärling et al., 2008). Acceptability is thus defined as the tendency to evaluate a road pricing scheme with some degree of favour or disfavour before it is implemented. Acceptance is defined as the tendency to evaluate a road pricing scheme with some degree of favour or disfavour after its implementation.

Attitudes are determined by people's beliefs about the consequences of the object at stake, which can be an event, a person, a type of behaviour, or a road pricing scheme (e.g., Ajzen,

1991; Eagly & Chaiken, 1993). Beliefs are defined as the subjective probability that an object has a certain outcome. The outcome of an object can be judged to be favourable, neutral or unfavourable, referring to the valence of a belief. For instance, one may believe that road pricing will lead to increasing costs (an unfavourable outcome), and that congestion and pollution levels will reduce (a favourable outcome of road pricing). Beliefs can change over time, for example as a result of changes in the context (Schwarz, 2007), experience, or as a result of merely thinking about an object (Tesser, 1978). Changes in beliefs will result in a change in attitudes (Ajzen, 1991). Hence, if people's beliefs about the consequences of road pricing schemes changes over time, their attitudes towards the scheme will probably change as well.

It can be assumed that traffic situations change after the implementation of a road pricing scheme. Also, it is likely that beliefs about consequences of road pricing scheme differ before and after their implementation, because consequences can never be fully predicted beforehand. Therefore, differences in acceptability and acceptance of road pricing schemes are likely to occur because beliefs about the consequences of a scheme have changed (cf., Gawronski & Bodenhausen, 2006b). More specifically, it can be expected that if acceptance of a road pricing scheme is higher than its acceptability, people's may belief that the occurrence of favourable consequences has become more likely. Or, acceptance of road pricing is higher than acceptability when the occurrence of unfavourable consequences has become less likely.

People may re-consider how important various consequences of road pricing schemes are to them after the implementation of the relevant scheme. In other words, they may re-evaluate the relative importance of various consequences of road pricing schemes. As a result, the acceptability of a road pricing scheme may be predicted by different beliefs about the scheme's consequences than its acceptance after the implementation (cf., Gawronski & Bodenhausen, 2006a). For example, the acceptability of a road pricing scheme may be low mainly because people expect their travel costs to increase. However, after the implementation of the scheme, travel costs may be considered to be less important than it was beforehand. Instead, people may consider the improved air quality to be most important for the acceptance of the scheme. In this example, acceptability of the scheme would be most strongly related to beliefs about travel costs, whereas acceptance would be most strongly related to beliefs about the effects of the scheme on air quality. We hypothesise that, as opposed to acceptability judgments, acceptance of a road pricing scheme is more strongly related to favourable or less strongly related to unfavourable beliefs about the scheme's consequences.

In conclusion, two aspects are relevant to understand differences in acceptability and acceptance of a road pricing scheme. First, differences in the beliefs about the likelihood that favourable and unfavourable consequences of road pricing schemes occur before and after its implementation should be examined. Second, it should be studied which beliefs about the effects of road pricing schemes are relatively most strongly related to their acceptability and acceptance judgments. In the present study, we examined both these aspects with respect to the trial with a congestion charge in Stockholm. In the next section, specific beliefs about the congestion charge that are relevant for the Stockholm case are discussed.

Beliefs about consequences of the congestion charge in Stockholm

The official objectives of the congestion charge trial in Stockholm was to decrease congestion, to improve the environmental quality, and to increase the accessibility in the city

centre of Stockholm (see, Stockholmförsöket, 2005; 2006). If people do not expect road pricing schemes to achieve their objectives, public support for these schemes is low (e.g., Gaunt et al., 2007). So, beliefs about the consequences of the congestion charge in terms of its objectives, that is congestion, environmental quality and accessibility, will be relevant for the acceptability and acceptance of the Stockholm congestion charge. Therefore, we focused on beliefs about three likely consequences of the charge, that is, beliefs about the consequences of the congestion charge for congestion, parking problems (both reflecting the accessibility of the city centre), and pollution. Reductions in congestion and parking problems, and increasing environmental quality are probably considered as favourable consequences of the charge, because they improve the general quality of life in cities.

A few months before and during the trial, public transport in and around Stockholm was extended and improved, to facilitate car users to replace their car trips by public transport. For those intending to replace car trips by trips by public transport or for regular users of public transport, an increase in the use of public transport may be an unfavourable consequence if this also means that public transport will become overcrowded. On the other hand, an increase in the use of public transport may be favourable to others, because it is an indication that car use decreased, and as a consequence, the quality of life Stockholm may increase. In any respect, beliefs about the consequences of the congestion charge on the crowdedness of public transport may affect the acceptability and acceptance of the congestion charge, and are therefore included in this study.

Next, the congestion charge can affect driving behaviour or the travel costs of car drivers, that is, car drivers may decide to drive less or they have to pay the charge. In general, reductions in driving behaviour and increases in travel costs are perceived as an infringement on one's freedom (cf., Brehm, 1972; Jakobsson et al., 2000), and consequently, these are unfavourable consequences of road pricing schemes.

Car users find road pricing less acceptable than non-car users (Jaensirisak et al., 2005), which may be explained by differences in beliefs about the consequences of road pricing. For example, it is very likely that beliefs about consequences of the congestion charge on one's own car use and travel costs differ between car users and non-car users. Also, car users tend to believe that congestion and pollution are less problematic for society than do non-car users (Rienstra et al., 1999), suggesting that their beliefs about the consequence of a congestion charge for congestion and pollution will probably differ as well. So, the extent to which inhabitants of Stockholm use their car can be expected to be related to the acceptability and acceptance of the congestion charge, and to their beliefs about the consequences of the congestion charge.

In this study, we included six beliefs about the consequences of the congestion charge in Stockholm that probably differ in the extent to which they are considered as favourable: beliefs about the consequences of the congestion charge for congestion, parking problems, pollution, crowdedness in public transport, one's own car use, and travel costs. First, we will compare if the valence of beliefs about the consequences of the congestion charge differs before and after the trial period. Second, we study how beliefs about the consequences of the charge are related to acceptability before and acceptance judgments after the trial period. We are particularly interested in the relative importance of beliefs about favourable and unfavourable outcomes for people's acceptability and acceptance judgments, as to study which beliefs are most salient for these judgements. We will control for the influence of the extent to which people use their car,

because the amount of car use probably affects the acceptability, acceptance and beliefs about the consequences of the congestion charge.

Hypotheses

We assume that the acceptance of the congestion charge in Stockholm is higher than its acceptability, in line with previous studies. Based on the reasoning above, we test two hypotheses to explain why acceptance of the charge is higher than its acceptability. First, we expect that inhabitants of the Stockholm region believe that the occurrence of consequences differs before and after the trial period. More specifically, we hypothesise that, as opposed to before the implementation of the charge, inhabitants of the Stockholm region believe that it is more likely that favourable consequences and less likely that unfavourable consequences will occur. Second, we expect that the relative importance of beliefs about the consequences of the charge differ for acceptability and acceptance levels. We hypothesise that acceptance is, compared to acceptability judgements, more strongly related to favourable or less strongly related to unfavourable beliefs about the consequences of the charge, when the extent to which people use their car is controlled for.

Method

Respondents and procedure

In December 2005, a questionnaire was mailed to a random sample of 1,000 inhabitants of the Stockholm municipality, that is, people living in the city of Stockholm. The addresses were randomly drawn from the public driving license records, implying that all respondents were 18 year or older and had a driving license. A reminder was sent out two weeks later to those who had not responded (viz. 350 people). The questionnaire was completed and returned by 444 respondents. Of these, 54.3% indicated that they would be willing to participate in a second study. These respondents received a second questionnaire in August 2006. It was stressed that this questionnaire should be completed by the same person who had completed the first questionnaire. After two weeks, a reminder was sent to those respondents who had not responded to the second questionnaire. The second questionnaire was completed and returned by 152 respondents (34%). Eight respondents were excluded form the analyses because their sex and year of birth did not correspond in both studies. In addition, one respondents was excluded, because this respondent estimated the costs of the congestion charge above the maximum amount per week (viz., 60 SEK per vehicle per day, see Table 4.1). Analyses were conducted with the 143 (44 female and 99 male) remaining respondents. The number of people living outside the city centre of Stockholm was slightly overrepresented in our sample: in Stockholm 69% of the population lives outside the city centre, whereas this was the case for 87% in our sample. Car use in our sample is relatively high, a majority indicated to make more that 75% of their trips by car both before (in December 2005) and after (in August 2006) the trial period.

Drop out of respondents is common in longitudinal studies (Abrahamse, Steg, Vlek, & Rothengatter, 2007). To test whether the drop out was selective, we examined whether respondents who completed both studies systematically differed from the respondents who

Table 4.2 Socio-demographics and number of trips with various modes for first (December 2005; N = 444) and second sample (August 2006; N = 143)

	Sample Dec 2005 N = 444		Sample Aug 2006 N=143		
Gender					t (415) = -0.27
% men	67.0 %		69.0 %		
% women	28.4 %		31.0 %		
missing	4.6 %		0.0 %		
Year of birth					t (413) = -0.06
before 1946	34.6 %		33.1 %		
between 1946 and 1956	21.7 %		26.1 %		
between 1956 and 1966	19.9 %		21.8 %		
after 1966	19.2 %		19.0 %		
missing	4.6 %		0.0 %		
Highest finished educational level					t (412) = -2.11*
primary school	14.3 %		9.2 %		
high school	33.3 %		35.2 %		
higher vocational/ university	45.7 %		53.5 %		
other	2.3 %		2.1 %		
missing	4.4 %		0.0 %		
Income level (annual, gross)					t (310) = -2.32*
less than 200.000 SEK	9.2 %		4.9 %		
between 200.000 – 299.000 SEK	18.9 %		19.7 %		
between 300.000 – 399.000 SEK	23.1 %		32.4 %		
more than 400.000 SEK	20.8 %		24.6 %		
missing	27.9 %		18.3 %		
Employment status					t (411) = 2.74*
in paid employment	67.0 %		78.2 %		
not in paid employment	28.4 %		21.1 %		
missing	4.6 %		0.7 %		
Percentage of trips made by different modes of transport, as indicated in December 2005[1]					
	M	(SD)	M	(SD)	
car	61.5	(38.2)	61.9	(38.3)	t (429) = -0.17
motorised transport (except car)	1.0	(8.2)	0.8	(7.6)	t (429) = 0.48
public transport	23.3	(31.2)	22.0	(30.3)	t (429) = 0.60
non-motorised transport	9.0	(19.5)	6.7	(20.2)	t (429) = -0.46
other modes	1.0	(8.5)	1.9	(12.2)	t (429) = -1.64

* p≤ .05

participated in the first study only on socio-demographics, travel behaviour, acceptability of the congestion charge, and beliefs about its consequences. Compared to respondents who participated in the first study only, respondents who completed both questionnaires had a higher income and educational level and were more likely to be in paid employment (Table 4.2)[1]. The percentage of trips made by various transportation modes, including car, and the number of days respondents would have to pay for the congestion charge when following their daily routine did not differ between both respondents groups, neither did their judgments of the acceptability of the congestion charge.

Questionnaires

Questionnaire December 2005

The questionnaire started with a short introduction of the Stockholm trial. Thereafter, the respondents were asked to indicate how many days they would have to pay the charge in order

to continue with their daily routine (46.3% 1–5 days a week, 8.2% once in a fortnight, 19.5% once a month). Next, they were asked to estimate how much they expected to pay during a typical week when the charge would be implemented (M = 53.2 SEK), which reflects their beliefs about the consequences of the charge for their travel costs. Moreover, respondents indicated the percentage of their trips they made by car, motorised transport except the car, public transport, non-motorised transport, and other transportation modes before the charge was implemented (December 2005; see Table 4.2). The percentage of trips made by car was included in the analyses to control for car use.

The second part of the questionnaire was aimed at measuring respondents' beliefs about the congestion charge. Respondents first listed three negative and three positive consequences of the congestion charge. These open questions were included to ascertain that respondents considered the pros and cons of the congestion charge seriously, and that the respondents would include these considerations in their evaluation of the congestion charge. Furthermore, respondents indicated, on a 7-point Likert scales ranging from very unlikely (1) to very likely (7), the extent to which they thought that the congestion charge would result in a decrease in their own use of the car (M = 2.3; SD = 1.95), pollution levels in the city centre (M = 3.8; SD = 1.86), and congestion in the city centre (M = 3.7; SD = 1.83). Moreover, they indicated to what extent they expected that parking a car in the city centre would become easier (M = 3.5; SD = 1.87), and that busses, undergrounds and commuter trains would become more crowded (M = 5.5; SD = 1.77). Respondents considered it rather unlikely that their own car use would be affected and they did not expect congestion, pollution and parking problems to decrease very much. However, respondents did consider it rather likely that public transport would become more crowded.

Acceptability was measured with a single item. Respondents were asked to indicate how acceptable the congestion charge was to them on a 7-point Likert scale ranging from very unacceptable (1) to very acceptable (7) (M = 2.6, SD = 2.2).

In the last part of the questionnaire, respondents indicate their socio-demographic background (year of birth, sex, educational level, income, employment status) and whether or not they were willing to participate in a second study.

Questionnaire August 2006

The second questionnaire comprised basically the same questions as the first questionnaire. The relevant questions were rephrased to assess beliefs about experienced consequences instead of beliefs about expected consequences of the congestion charge. For instance, 'how likely do you think it is that congestion levels in the city centre will reduce if the congestion charge is implemented?' was rephrased as 'did congestion levels in the city centre reduce after the congestion charge was implemented?'. Moreover, in the last part of the second questionnaire, respondents indicated their sex and year of birth in order to check whether the same respondent completed both questionnaires.

Acceptance of the congestion charge was measured in the same way as its acceptability. In line with previous studies on the Stockholm congestion charge, acceptance of the congestion charge (M = 3.2, SD = 2.3) was significantly higher than its acceptability (M = 2.6, SD = 2.2; $t(140) = 4.4$, $p < .001$) (Stockholmförsöket, 2006; Winslott-Hiselius et al., 2009). Acceptance is below average, indicating that a majority opposed to the congestion charge after it was implemented.

Table 4.3 Means, standard deviations and paired t-test of acceptability, expected effects before (December 2005) and perceived effects after (August 2006) the implementation of the congestion charge (N=143)

	Before trial December 2005 M (SD)	After trial August 2006 M (SD)	t	df
Beliefs about consequences of the charge on				
- congestion [1]	3.7 (1.96)	4.9 (1.96)	7.6 ***	137
- parking problems [1]	3.3 (1.81)	3.7 (2.06)	2.7 **	134
- pollution [1]	3.7 (1.98)	4.6 (1.95)	5.2 ***	135
- own car use [1]	2.2 (1.83)	2.4 (2.02)	1.0	143
- travel costs [2]	49.4 (70.11)	39.6 (63.84)	-2.1 *	125
- crowdedness in public transport [1]	5.6 (1.69)	5.3 (1.66)	-1.5	131

* p≤ .05; ** p≤ .01; *** p≤ .001

[1] scores could range from 1 (very unlikely) to 7 (very likely)

[2] scores could range from 0 to 300 SEK

Results

First, we examined the differences between respondents' belief about the consequences of the congestion charge before (December 2005) and after (August 2006) the charge was implemented. Table 4.3 shows the means and standard deviations of respondents' beliefs about the consequences of the charge on congestion, parking problems, pollution, crowdedness in public transport, one's own car use, and travel costs before and after its implementation. Also, results of paired t-test are given. After the trial, respondents believed congestion, parking problems and pollution decreased more than they believed before the charge was implemented. Respondents indicated that they believed their travel costs had increased somewhat less after the charge was implemented than they had expected beforehand. No differences were found between the extent to which respondents expected to reduce their car use before the trial period and the extent to which they had reduced their car use after the trial period. Moreover, beliefs about the consequences of the charge on the crowdedness of public transport did not significantly differ before and after the implementation of the charge.

Next, we examined the relative importance of beliefs about the consequences of the congestion charge for its acceptability and acceptance levels. We calculated partial correlations coefficients, controlling for the percentage of car trips made[2]. Before the trial with the congestion charge in December 2005, acceptability was higher when respondents believed that congestion ($r = .50$, $p<.001$), parking problems ($r = .42$, $p<.001$), pollution ($r = .50$, $p<.001$), and their own car use ($r = .43$, $p<.001$) would decrease, when the percentage of trips made was controlled for. Acceptability was slightly lower when respondents believed their travel costs would increase ($r = -.17$, $p = .057$), when the percentage of trips made was controlled for. No significant correlation was found between the acceptability of the congestion charge and respondents' beliefs about the consequences of the charge for the crowdedness in public transport.

After the trial in August 2006, acceptance was higher when respondents believed that congestion ($r = .46$, $p<.001$), parking problems ($r = .48$, $p<.001$), pollution ($r = .45$, $p<.001$), and their own car use ($r = .27$, $p<.01$) had decreased, and acceptance was lower when they believed that public transport had become more crowded ($r = -.19$, $p<.05$), when the percentage of car trips made was controlled for. Acceptance was not significantly correlated to beliefs about travel costs of the charge when the percentage of trips was controlled for.

Table 4.4 Regression analysis of percentage of car trips and beliefs about the consequences of the congestion charge on acceptability before the trial in December 2005 (N=143)

Model	β	t	p	F	p	df1, df2	R^2
Step 1				14.14	.000	1, 133	.10
Percentage car trips	-.31	-3.76	.000				
Step 2				14.03	.000	7, 127	.44
Percentage car trips	-.08	-1.16	.250				
Beliefs about consequences of the charge for							
- congestion	.27	1.83	.070				
- parking problems	.04	0.34	.733				
- pollution	.16	1.09	.276				
- own car use	.28	3.72	.000				
- travel costs	-.16	-2.23	.027				
- crowdedness in public transport	-.09	-1.20	.233				

Table 4.5 Regression analysis of percentage of car trips and beliefs about the consequences of the congestion charge on acceptance after the trial in August 2006 (N=143)

Model	β	t	p	F	p	df1, df2	R^2
Step 1				5.60	.020	1, 107	.05
Percentage car trips	-.22	-2.37	.020				
Step 2				8.35	.000	7, 101	.37
Percentage car trips	-.10	-1.04	.301				
Beliefs about consequences of the charge for							
- congestion	.14	0.95	.345				
- parking problems	.25	2.28	.025				
- pollution	.14	1.02	.310				
- own car use	.25	2.91	.004				
- travel costs	-.03	-0.38	.705				
- crowdedness in public transport	-.08	-0.91	.364				

Next, the relative importance of six beliefs about the consequences of the congestion charge for its acceptability was examined, controlling for the extent to which respondents use their car. Therefore, two regression analyses were conducted. First, a regression analysis was conducted to examine which beliefs about the expected consequences of the charge predicted its acceptability in December 2005, before the charge was implemented. Variables were entered in two steps, to control for the extent to which respondents use their car (Table 4.4). In the first step, the percentage of trips made before the trial was included as predictor of the acceptability of the congestion charge, which explained 10% variance in acceptability. Acceptability was lower when respondents made more trips by car (β = -.31, p<.001). Next, beliefs about the consequences of the charge for congestion, parking problems, pollution, one's own car use, travel costs, and crowdedness in public transport were included in the model as well. This model explained 44% of the variance in acceptability, with the six beliefs about the consequences of the congestion charge explaining 34% additional variance in acceptability. Only beliefs about the consequences of the charge for one's own car use and travel costs contributed uniquely and significantly to the explanation of the variance in acceptability of the charge. Acceptability was higher when respondents believed their own car use would decrease (β = .28, p<.001) and when they believed that their travel costs would not increases much (β = -.16, p<.05).

Next, following the same procedure, a regression analysis was conducted to examine the

relationship between the acceptance of the congestion charge and respondents' beliefs about the consequences of the charge in August 2006, after its implementation (Table 4.5). The percentage of trips made by car after the trial explained 5% in variance of the acceptance of the charge (β = -.22, p<.05). When beliefs about the consequences of the charge for congestion, parking problems, pollution, one's own car use, travel costs, and crowdedness in public transport were entered in the second step, an additional 32% of variance in the acceptance of the charge was explained. Beliefs about the consequences of the charge for one's own car use and parking problems contributed uniquely and significantly to the model only. Acceptance was higher when respondents believed their own car use (β = .25, p<.01) and parking problems (β = .25, p<.05) had decreased.

Discussion

This study aimed to explain why acceptance of the congestion charge in Stockholm was higher after its implementation in 2006 than its acceptability beforehand. We hypothesised that acceptance of the charge would be higher than its acceptability levels, because people have more favourable or less unfavourable beliefs about the consequences of the congestion charge after the trial than beforehand. Indeed, we found that respondents considered it more likely that congestion, parking problems, and pollution had decreased after the implementation of the charge than they had expected beforehand, which suggests that respondents had more favourable beliefs about the charge. Also, after the implementation of the congestion charge, respondents believed that their travel costs had increased less than they expected before the trial, which indicates that respondents also had less unfavourable beliefs about the charge. So, our first hypothesis was confirmed: respondents believed that the congestion charge had more favourable (i.e., less congestion, parking problems, pollution) and less unfavourable effects (i.e., less increases in travel costs) after the congestion charge had been implemented than was expected beforehand.

A regression analysis revealed that acceptability of the congestion charge was lower when respondents believed their travel costs would increase, while the perceived travel costs after the charge were not significantly related to acceptance judgements. As reported above, we also found that the increase in cost was not believed to be as large as respondents had expected beforehand. This suggests that travel costs of the charge were important for acceptability judgements before the congestion charge was implemented, but not for its acceptance afterwards. So, as expected, acceptance of the charge was less strongly related to unfavourable consequence than acceptability judgements. Furthermore, regression analysis shows that the congestion charge was more acceptable when respondents believed that it had become easier to find a place to park, when other beliefs and the percentage of car use were controlled for. Therefore, as expected, our results also indicated that acceptance of the charge was more strongly related to favourable consequence than acceptability judgements. These results are irrespective of the extent to which people use their car. This indicates that instead of focussing on the unfavourable consequences of the charge (i.e., increased travel costs), favourable consequences of the charge (i.e., decreasing parking problems) were more predictive of acceptance as opposed to the acceptability of the charge, providing support for our second hypothesis. Moreover, perceived reductions in parking problems appeared to be relatively more important for acceptance levels of the charge than other positive effects that

were perceived (e.g., reductions in congestion and pollution). Apparently, our respondents were more concerned about parking problems than about congestion or pollution levels.

Both acceptability and acceptance of the charge were higher when respondents believed their own car use would or had been decreased. Apparently, those who can and are willing to decrease their car use find the congestion charge more acceptable. This indicates that people may perceive some feasible alternatives for their car trips. This suggests that providing alternatives for car trips is an important part of the total strategy. In Stockholm, public transport was improved and expanded as part of the trial, which resulted in a 4% increase in public transport use (Miljöavgiftkansliet, 2006). Car users may have perceived alternatives for their car trips, which may explain why acceptance of the charge was higher that its acceptability (see also, Kottenhoff & Brundell-Freij, 2009).

Overall, this study suggests that the acceptance of the congestion charge in Stockholm is higher than its acceptability, because people had more positive and less negative beliefs about the consequences of the charge after the trial. Our results are in line with previous studies on the actual effects of the congestion charge. During the trail, the number of cars entering the zone decreased with 22% on weekdays between 6.30 am and 6.30 pm, and as a result, congestion and pollution levels decreased (Eliasson, Hultkrantz, Nerhagen, & Rosqvist, 2009; Stockholmförsöket, 2006). Also, the number of parking places had increased in the inner city of Stockholm. Hence, it is likely that our respondents actually experienced positive consequences of the congestion charge, which may explain why they had more positive beliefs about the congestion charge after it was implemented. Moreover, we found that the travel costs did not increase as much as expected beforehand, which suggests that the less negative effects were experienced that respondents had expected. So, it seems plausible to assume that acceptance levels were higher than acceptability levels because of positive experiences and/or more realistic perceptions of the effects of the congestion charge during the trial period.

On the basis of our study, we cannot be sure about the causal relationship between respondents' acceptability, acceptances and beliefs about the consequences of the charge. For example, one could argue that people who find the charge unacceptable stress unfavourable consequences of the charge, rather than the other way around. However, our results also indicate that respondents believed that the charge had more positive effects and less negative effects after the trial period than they expected beforehand. Therefore, they did not merely focus more strongly on positive and less strongly on negative effects after the trial period, but they were also more positive/less negative about the consequences of the charge. Consequently, we assume that acceptability and acceptance judgements were determined by people's beliefs about the consequences of the charge instead of the other way around. Future studies are needed to examine this assumption.

Results of this study should be interpreted with some care. First, our sample was not fully representative of the Stockholm population, which may have affected the external validity of our study. Overall, the mean acceptance scores in our sample were low in comparison to the results of the referendum. This can be explained by the overrepresentation of people living outside the city centre of Stockholm, who had lower acceptance scores than people living inside the city centre. Also, respondents hardly reported (intentions to) reduce their own car use, which are often people who find road pricing schemes unacceptable (Jakobsson et al., 2000). Apparently, respondents who evaluated the charge as not very acceptable were somewhat more strongly motivated to fill out our questionnaires. Perhaps they thought that expressing their opinion in a

questionnaire would influence decision making process of the charge. We cannot exclude the possibility strategically answering by respondents. However, even though our sample may be somewhat more sceptical towards the charge, we still found evidence that acceptance of the charge was higher than acceptability, because people were more positive (and less negative) about the effects of the charge. Also, we were particularly interested in changes in and relationships between variables, and not in the absolute score on the key variables. We have no reason to believe that relationships between variables would be different in a representative sample, or that relationships would be different when strategic answering would have been impossible. Of course, our conclusions remain tentative until our study has been further validated.

Second, all inhabitants of Stockholm faced the congestion charge, and as a consequence, we could not compare the results with a control group. Therefore the context in which the trial took place should be taken into account when interpreting the results. Isaksson and Richardson (2009a) argue that the central strategy that was followed in Sweden was aimed at overcoming public resistance and meeting political needs. The central strategy comprised the trial and a referendum. Inhabitants of Stockholm were 'forced' to undergo the congestion charge for 7 months, and in return, were given the power to make the final decision in the referendum. With respect to road pricing, the combination of a trial period followed by a referendum is rather unique. The trial period gave inhabitants of Stockholm the opportunity to experience the positive consequences of the congestion charge, as we have shown in this study. The referendum was likely to give inhabitants of Stockholm the feeling that fair procedures were followed, which is an important precondition for the acceptability of policies (Tyler, 2000). Having a referendum about a road pricing scheme without a trial period may result in a rejection of the scheme, because the benefits of road pricing would not have been experienced. For example, residents of Edinburgh, Scotland, voted against the implementation of a road pricing scheme in 2005 (see also, Gaunt et al., 2007). One explanation for this rejection in Edinburgh is that the referendum was held without a preceding trial period, and thus, residents could not experience the potential positive effects of a road pricing scheme. So, experiencing the positive consequences of a road pricing scheme in combination with the referendum seems to have contributed to the acceptance of the congestion charge in Stockholm.

Another important factor in Stockholm was the information given to the public. One important source of information was the official website of the Stockholm council on which reports were published by the authorities, stressing the positive effects of the congestion charge in particular. A second important source of information was the Swedish mass media. The opinion of the mass media on the congestion charge shifted from generally anti to relatively pro congestion charge during the trial (Winslott-Hiselius, Brundell-Freij, Vagland, & Byström, 2009e). The public received much information about positive effects of the congestion charge. The positive information combined with personal positive experiences with the congestion charge can explain why acceptance of the charge was higher than its acceptability.

We showed that experiencing positive consequences of a road pricing scheme is one important factor for its acceptance. Our results suggest that when the experience of positive consequences is lacking, acceptance of road pricing will not be high, and may even be lower than its acceptability levels before the implementation. Therefore, road pricing schemes can best be implemented when the likelihood of positive effects is high, such as in areas with significant problems. On the basis of our data we cannot indicate whether acceptance levels will

increase when positive experience are perceived on an individual and/or on a collective level. This is an important topic for future research.

In conclusion, effective road pricing schemes can be acceptable when people experience the benefits of a scheme. The Stockholm trial is a good example of a road pricing scheme that is both effective in achieving its goals and acceptable to the public. The results give cause to optimism, because it shows that road pricing can be an acceptable instrument to change transport behaviour (e.g., see Eliasson et al., 2009) and effectively decrease problems at the same time. There is no guarantee that implementing road pricing will be acceptable and effective in every situation. However, making sure that people have the opportunity to gain positive expectations, and when possible, positive experiences with road pricing schemes is one important factor for securing public support.

---

[1] Income, educational level and employment status were not systematically correlated to acceptability, acceptance, and beliefs about the consequences of the congestion charge, which is in line with other studies (e.g., Jaensirisak et al., 2005; Ubbels, 2006). Therefore, we assume that the differences found between both respondents groups did not affect our results.

[2] The higher the percentage of trips respondents made by car, the lower were their acceptability ($r = -.32$, $p < .001$) and acceptance levels ($r = -.23$, $p < .01$) for the congestion charge. Before the congestion charge (December 2005), bivariate correlation coefficients indicate that the higher percentage of trips respondents made by car, the more they expected their travel costs to increase ($r = .29$, $p < .001$), and the less likely they considered it that congestion ($r = -.24$, $p < .05$), parking problems ($r = -.24$, $p < .05$), pollution ($r = -.24$, $p < .05$), and their own car use ($r = -.24$, $p < .05$) would decrease. No statistically significant correlation was found for the percentage of trips made by car and the expected effects on the crowdedness of public transport. After the congestion charge (August 2006), the higher the percentage of car trips made by car, the more respondents perceived travel costs had increased ($r = .39$, $p < .001$), the less they had decreased their own car use ($r = -.36$, $p < .001$), and the less they perceived decreases in pollution levels ($r = .22$, $p < .05$). No statistically significant correlations were found for the percentage of trips made by car and the expected effects on congestion levels, parking problems and the crowdedness of public transport.

Chapter 5

Acceptability and fairness

When are Transport Pricing Policies Fair and Acceptable?

Abstract

This study examines the relative importance of six fairness principles for the perceived fairness and acceptability of pricing policies aimed at changing transport behaviour. The overall fairness and acceptability of six different types of transport pricing policies were systematically related to two fairness principles, that is, environmental justice and equality. The overall fairness and acceptability of policy measures was higher when respondents believed that future generations, nature and the environment were protected (reflecting environmental justice), and to a lesser extent, when everybody was equally affected by the policy outcomes (reflecting equality), irrespective of absolute differences in overall fairness and acceptability of the policies. Fairness principles reflecting egoistic concerns (e.g., being financially worse off) and equity (e.g., policy outcomes proportional to people's contribution to problems) were related to the overall fairness and acceptability of some policy measures, but no systematic pattern was found across all six policy measures. Our results suggest a general preference for environmental justice and equality. Also, fairness principles that focus on collective considerations appear to be more important for the overall fairness and acceptability of transport pricing policies than those focusing on individual interests. Theoretical and practical implications of these results are discussed.

This chapter is based on:
Schuitema, G., Steg., L., & Van Kruining, M., (2010). When are transport pricing policies fair and acceptable? The role of six fairness principles. *Social Justice Research, revised paper under review.*

Introduction

Public policies aimed at reducing social problems often involve that some people should change their behaviour or are restricted in their freedom to safeguard collective qualities. For example, transport policies are implemented to protect environmental quality or to reduce traffic accidents, and public health is protected by increasing taxes on alcohol and cigarettes. Although such policies generally increase overall quality of life of the population, they may have negative consequences for some groups. For example, transport pricing policies may reduce environmental problems and congestion, but they can affect car drivers negatively as travel costs increase or because some people can no longer afford to make certain trips. The extent to which the collective and individuals are affected by policies depends on the way policy outcomes are distributed. Public acceptability of such policies tends to be low when the outcomes are believed to be distributed in an unfair way (Cvetkovich & Earle, 1994; Tyler, 2000). But which distribution of costs and benefits is perceived to be fair and acceptable? This is a highly relevant question, as policy makers are reluctant to implement policies that lack public support.

Little is known about which distribution of policy outcomes is considered to be most fair and acceptable, especially with respect to public policies. Important questions are: how should costs and benefits of public policies be distributed to increase overall fairness and acceptability of these policies? Which type of distributional fairness do people prefer? This study aims to study how the evaluation of the distribution of costs and benefits (i.e., distributional fairness) is related to the evaluation of the overall fairness and acceptability of public policies. As a case in point, we focus on a public policy for which perceived fairness and acceptability play a key role, that is, transport pricing policies. Transport pricing policies are aimed at reducing the negative effects of car use and car ownership, including environmental problems and congestion, by increasing the costs of the undesired behaviour (e.g., extensive car use, the purchase of energy inefficient cars) or decreasing the costs of the desired behaviour (e.g., reduced kilometrage, purchase of energy-efficient cars).

Various studies showed that the perceived overall fairness and acceptability of transport pricing policies are strongly related (e.g., Bamberg & Rölle, 2003; Eriksson et al., 2006; 2008c; Fujii, Gärling, Jakobsson, & Jou, 2004; Jakobsson et al., 2000; Odeck & Bråthen, 1997). This result is not surprising, because the definition of acceptability is quite similar to the definition of distributive fairness. Acceptability of transport pricing has been defined as ‘an evaluation of the expected costs and benefits of transport pricing’ (e.g., Eriksson et al., 2006), while distributive fairness has been defined as ‘an evaluation of the *distribution* of expected costs and benefits of transport pricing’ (Deutsch, 1975; 1985). People may differ in their preferences for distribution of costs and benefits of policies, and thus in their preference for different fairness principles.

To evaluate the fairness of policies, people compare the expected outcomes of the policy with a reference point (Kahneman, 1992b). In general, three different types of comparisons can be made, each based on a different reference point: intrapersonal, interpersonal and intergenerational comparisons. Below, we explain these three types of comparisons, and propose six fairness principles reflecting these types of comparisons that are relevant for the evaluation of the fairness and acceptability of transport pricing policies (see also Figure 5.1).

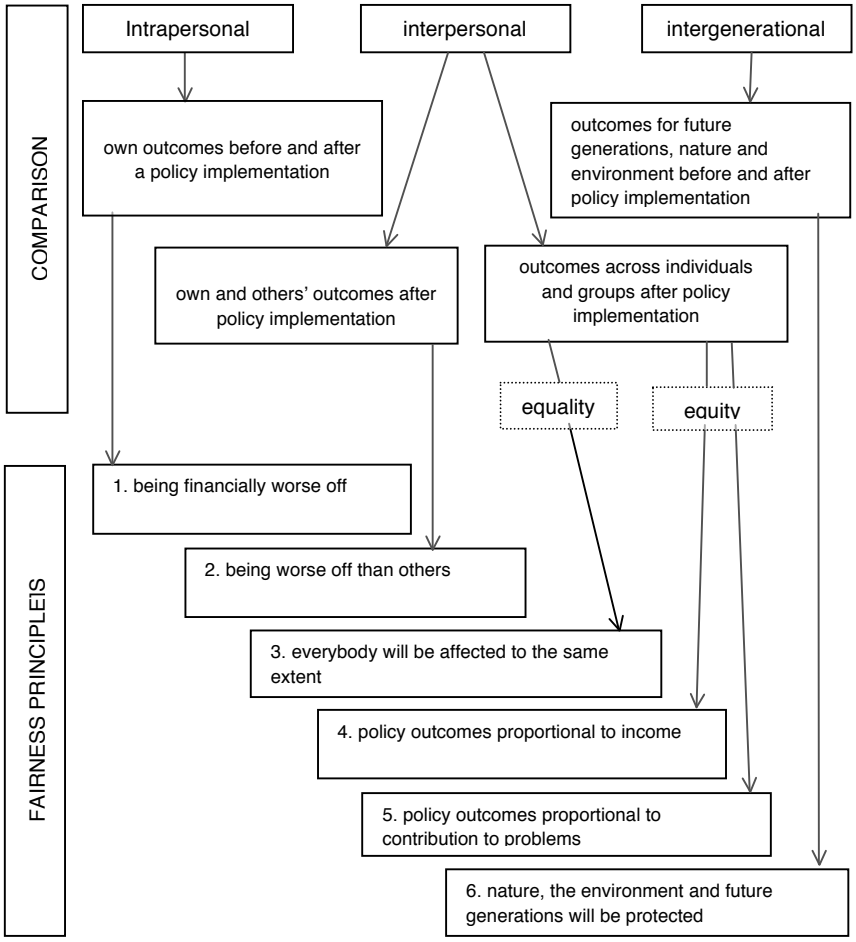

Figure 5.1 Classification of fairness principles

Intrapersonal comparisons

Intrapersonal comparisons refer to a comparison of policy outcomes with an internal reference level or previous personal outcomes, independent of outcomes of others (Loewenstein, Thompson, & Bazerman, 1989c). Thus, an intrapersonal comparison reflects that people compare their current outcomes (i.e., outcomes before a policy is implemented) with outcomes of a policy for themselves after a policy is implemented. So, in this case people focus on outcomes for themselves. Such comparisons are often associated with a focus on self-interest, which is not believed to reflect fairness (e.g., Bazerman, Loewenstein, & White, 1992; Bazerman, White, & Lowenstein, 1995; Bethwaite & Tompkinson, 1996; Handgraaf, Dijk, Wilke, & Vermunt, 2004; Loewenstein, Thompson, & Bazerman, 1989b). However, we believe that people may consider it as unfair if they are worse off after the implementation of a policy

measure than before. Therefore, we consider a comparison of one's own outcomes before and after the implementation of a policy measure as a relevant fairness principle. With respect to fairness and acceptability of transport pricing policies, a relevant intrapersonal comparison involves a comparison of ones *financial* costs before and after the implementation of transport pricing policies. So, the first fairness principle we distinguish reflects the extent to which one is financially worse off after a policy implementation (fairness principle 1: being financially worse off).

Interpersonal comparisons

Interpersonal comparisons imply that others' outcomes are taken into account when people evaluate policy outcomes, that is, how policies affect different individuals or groups in society. Two different interpersonal comparisons can be made. First, one can compare one's own outcomes with the outcomes of others, which reflects to what extent one is worse off than others (fairness principle 2: being worse off than others). This fairness principle refers to negative outcomes for oneself relative to others: policies are probably considered to be less fair an less acceptable when people expect to be worse off than others (cf., Diekmann, Samuels, Ross, & Bazerman, 1997a).

Second, one can compare the outcomes of policies across individuals or groups in the population. Two important fairness principles for evaluating the cost and benefits across individuals or groups are equality and equity (Deutsch, 1975; Messick, 1993; Hegtvedt & Cook, 2001). Equality refers to an equal distribution of the costs and benefits across all people (Deutsch, 1975; 1985). In the realm of transport pricing policies, an equal distribution implies that a policy affects everybody to the same extent (fairness principle 3: equality).

Equity implies that outcomes of policies are distributed in proportion to personal characteristics or to one's contribution to a problem (Adams, 1965; Walster, Berscheid, & Walster, 1973). A personal characteristic that is particularly relevant in the case of transport pricing policies is income, because it is often argued that lower income groups should not be affected disproportionally (see, Ubbels & Verhoef, 2007). Hence, a relevant fairness principle reflects a distribution of the outcomes of transport pricing policies in proportion to one's income. We defined the fourth fairness principle as: low income groups are affected less strongly than high income groups when transport pricing policies are implemented (fairness principle 4: equity, policy outcomes proportional to income).

Equity can also imply that outcomes are distributed in proportion to people's contribution to problems. With respect to transport pricing policies, people's contribution to car-related problems, such as congestion or emissions, is a relevant evaluation criterion that could be used to determine the overall fairness and acceptability of policies (Button, 1993). This is reflected in our fifth fairness principle: those who contribute most to problems are most strongly affected by transport pricing policies (fairness principle 5: equity, policy outcomes proportional to contribution to problems).

Intergenerational comparisons

Recently, it has been proposed that the outcomes of others should be considered in a boarder context, that is, the outcomes for future generation should be taken into account as well (Clayton, 2000; Wade-Benzoni, 2002; Wade-Benzoni, Hernandez, Medvec, & Messick, 2008b),

which implies that intergenerational comparisons are made. Generally, people consider and value the outcomes for future generations, particularly in the sense that nature and the environment should be protected (Clayton, 2000; Wade-Benzoni, 2002; Wade-Benzoni, Hernandez, Medvec, & Messick, 2008a). The fairness principle environmental justice reflects the extent to which future generations are protected, by preserving natural resources (Clayton, 2000). Environmental justice may be important for the fairness and acceptability of transport pricing policies, because these policies are generally aimed at preserving collective resources by reducing the environmental impacts of cars. Therefore, the sixth fairness principle that we distinguish concerns the protection of nature, the environment, and future generations (fairness principle 6: environmental justice).

Relationship between Fairness, Acceptability and Fairness Principles

We assume that people's evaluation of the extent to which transport pricing policies meet fairness principles affect the evaluation of the overall fairness and acceptability of these policies. Which outcome distribution is most predictive of the overall fairness and acceptability of transport pricing policies probably depends on one's value orientation (Anderson & Patterson, 2008). It is often assumed that people *a priori* act upon their egoistic values, implying that they aim to maximise their self-interests (Moore & Loewenstein, 2004). The first two fairness principles we distinguished (i.e., being worse off financially and being worse off than others) reflect a concern with egoistic outcomes, as both refer to a specific concern with negative outcomes for oneself. Hence, if people are indeed merely concerned with self-interest, they probably find transport pricing policies unfair and unacceptable when they expect to be financially worse off or worse off than others after the implementation of a policy measure.

However, it has also been proposed that people do not only try to maximise their own interests, but they consider interests of the collective as well (De Groot & Steg, 2008; Stern, 2000; Stern & Dietz, 1994), and act upon altruistic and biospheric values too. In line with this, it has been argued that the fairness principles equality, equity, and environmental justice are important to people due to a collective concern (Lerner, 2003; Schwartz, 1977; Tyler, 2000; Wade-Benzoni & Tost, 2009d). In addition, individuals may expect to personally benefit as well when outcomes are distributed on the basis of equality, equity, or environmental justice, for example because people feel good about themselves when taking care of others (e.g., Diekmann, Samuels, Ross, & Bazerman, 1997b; Messick & McClintock, 1968; Wade-Benzoni & Tost, 2009c). If people indeed focus on collective outcomes, it can be expected that transport pricing policies are considered to be more fair and acceptable when outcomes are distributed on the basis of equality, equity, or environmental justice.

Studies on fairness and acceptability of transport pricing policies indicate that collective considerations are indeed important, in addition to self-interest (De Groot & Steg, 2009b; Eriksson et al., 2006). Also, studies in the energy field indicate that the acceptability of policies aimed to promote energy conservation is related to collective considerations (e.g., Steg, Dreijerink, & Abrahamse, 2005). Studies indicate that solving collective problems related to car use is particularly important for the acceptability of transport pricing policies rather than individual outcomes (Schuitema, Steg, & Forward, 2010; Schuitema, Steg, & Rothengatter, 2010), suggesting that the overall fairness and acceptability for transport pricing policies are more strongly related to collective interests than to individual interests. Therefore, it may be

expected that the overall fairness and acceptability of transport pricing policies depend more strongly on the fairness principles that reflect a concern with collective outcomes than to fairness principles that reflect a concern with individual outcomes. Thus, it can be expected that the fairness principles 'equality' 'policy outcomes proportional to income', 'policy outcomes proportional to contribution to problems' and 'environmental justice' are more strongly related to the overall fairness and acceptability of transport pricing policies than the fairness principles 'being financially worse off' and 'being worse off than others'.

Are equality, equity and environmental justice equally strongly related to the overall fairness and acceptability of transport pricing policies? Many studies indicate a general preference for an equal distribution of outcomes over other fairness principles (e.g., Eek, Biel, & Gärling, 1998; 2001; Kahneman, Knetsch, & Thaler, 1986b; Loewenstein, Thompson, & Bazerman, 1989a; Messick & Sentis, 1979a; Messick & Schell, 1992), but these studies did not include environmental justice. Recent studies that did include environmental justice suggest that people have a strong preference for environmental justice as well. For example, Clayton (2000) found that the fairness principle environmental justice was considered to be more important in environmental conflicts than distributions based on equity and equality. So, there seems a general preference for equality and environmental justice. Therefore, it may be expected that overall fairness and acceptability of transport pricing policies are more strongly related to equality and environmental justice than to equity.

Fairness and Acceptability of Different Types of Transport Pricing Policies

Different policies have different cost and benefits, and consequently, the overall fairness and acceptability of transport pricing policies may differ for various types of policies (e.g., Eriksson et al., 2006; Steg, 1996). We assume that differences in the overall fairness and acceptability of policies are due to the fact that these policies meet the six fairness principles differently. If this is true, the six fairness principles should predict overall fairness and acceptability in a similar way, that is, the same fairness principles should consistently predict overall fairness and acceptability of different types of policies. To test this assumption and to test the robustness of our results, we will examine how the fairness principles are related to the overall fairness and acceptability of six different transport pricing policies. These policies differ systematically on two characteristics that are important for the overall fairness and acceptability of policies, as explained below.

First, we distinguish transport pricing policies that aim to change car ownership in order to reduce the environmental impact per car (e.g., impose a tax on cars with high environmental impact) and transport pricing policies that aim to reduce car use (e.g., impose a tax on a high annual kilometrage). Policies that aim to reduce car ownership are generally evaluated as more acceptable than policies that aim to reduce car use, because the latter usually requires more effort and reduces people's freedom (Poortinga et al., 2003; Steg et al., 2006). To authors' knowledge, no studies examined differences in the perceived fairness between policies aimed at reducing car use versus policies aimed at changing car ownership. Considering that the perceived fairness and acceptability of policies are strongly correlated, it is likely that policies aimed to change car ownership are also considered to be more fair than policies aimed to reduce car use.

Second, transport pricing policies can imply increasing the price of undesired behaviour

(e.g., purchasing a car with a high environmental impact or a high annual kilometrage). These policies are usually referred to as push measures. On the other hand, transport pricing policies can imply a decrease in the price of desired behaviour (e.g., purchasing a car with a low environmental impact or a low annual kilometrage). These policies are usually referred to as pull measures. Pull measures generally increase people's opportunities: the desired behaviour becomes more attractive while the consequences of the undesired behaviour do not change. Pull measures increase or, at least, do not decrease individual freedom of choice. Push measures, on the contrary, regulate people's behaviour in such a way that their options and freedom to move are restricted to some extent, since car use or the purchase of environmentally-unsound cars becomes less attractive. Overall, push measures are evaluated as more coercive than pull measures, and as a result, push measures are generally considered to be less fair and acceptable than pull measures (Eriksson et al., 2006; 2008b; Gärling & Schuitema, 2007; Schade & Schlag, 2003; Steg, 1996). Push measures are generally more effective in changing car use and car ownership, and consequently in reducing car-related problems, than pull measures (Gärling & Schuitema, 2007). A combination of push and pull measures may be more fair and acceptable than separate push or pull measures, because when push measures are combined with pull measures, problems are likely to be solved, while alternatives are provided as well.

This study

In sum, we assume that the extent to which a transport pricing policy meets particular fairness principles predict the overall fairness and acceptability of these policies. First, in line with previous studies, we hypothesise that overall fairness and acceptability of transport pricing policies are strongly and positively related to each other. Our main aim is to examine to what extent different fairness principles are related to the overall fairness and acceptability of transport pricing policies. Our study is explorative, but based on previous studies, we have the following expectations. First, we expect that the fairness principles 'equality', 'policy outcomes proportional to income', 'policy outcomes proportional to contribution to problems' and 'environmental justice' are more strongly related to the overall fairness and acceptability of transport pricing policies than the fairness principles 'being financially worse off' and 'being worse off than others'. Second, we expect that equality and environmental justice are stronger predictors of the overall fairness and acceptability of transport pricing policies than both fairness principles reflecting equity (i.e., policy outcomes proportional to income and policy outcomes proportional to contribution to problems). Third, we assume that overall fairness and acceptability of different transport pricing policies is consistently related to the same fairness principles, irrespective of the differences in the overall fairness and acceptability of policy measures. To test this assumption, transport pricing policies that are assumed to differ in overall fairness and acceptability are evaluated.

When asking respondents directly to evaluate the relative importance of fairness principles, they may provide socially desirable answers in order to present a favourable picture of themselves (cf., Diekmann, 1997). To reduce the chance of socially desirable answers, we will ask respondents to what extent different fairness principles apply to a particular policy, without explicitly asking them to compare or to rate the fairness principles. Next, we examine to what extent overall fairness and acceptability are predicted by the extent to which the different

fairness principles are met when the policy would be implemented. This is an indirect way of establishing the importance of fairness principles, which has proven to yield reliable results in studies in other domains (cf., Nolan, Schultz, Cialdini, Goldstein, & Griskevicius, 2008).

Method

Procedure and sample

A questionnaire was distributed in various neighbourhoods in an average-sized city in The Netherlands. Respondents were approached at home and requested whether they owned a car. In case they did, they were asked to fill out a questionnaire. About 33% (N = 101) of the people contacted completed the questionnaire. Questionnaires were collected at their homes within a few days later upon appointment.

The sample was reasonably representative of the Dutch population, although respondents with a high income and education level were overrepresented. Also, respondents' annual kilometrage was somewhat higher (17,000 km/year) than the national average (16,000 km/year). However, income, educational level and annual kilometrage did not systematically correlate with perceived fairness, acceptability and the evaluation of six fairness principles. So, it is unlikely that the higher income, educational level and annual kilometrage of respondents affected our results. Moreover, because we are interested in correlations rather than in mean scores, a sample that is not fully representative is less problematic (cf., Schultz et al., 2005).

Design

The study followed a 2×3 within-subjects design (see Table 5.1). The first factor reflected the aim of the policy measure. Two levels were distinguished: a policy measure aimed to reduce car use and a policy measure aimed to change car ownership. The policy measures that aimed to reduce car use implied that road taxes depended on people's annual kilometrage. The policy measures that aimed to change car ownership implied that a tax on the purchase of new cars depended on the fuel consumption of the car.

The second factor had three levels. The policy measure could be a push or a pull measure, or a combination of both. For the policy measure aimed at reducing car use, the push measure implied that road taxes increased with €500 for car users driving more than the Dutch annual kilometrage (i.e., 16,000 kms) ('car use, push'). The pull measure implied that road taxes decreased with €500 a year for car users with an annual kilometrage below 10,000 km's ('car use, pull'). A combination of both descriptions was given in case push and pull measure were combined ('car use, combination'). The policy measure aimed at changing car ownership implied that prices of cars that drives 13 kms or less on 1 litre of fuel would increase by €1,000 ('car ownership, push'), that prices would decrease by €1,000 when a car drives 17 kms or more on 1 litre of fuel ('car ownership, pull'), or a combination of the two ('car ownership, combination'). The policy measures were presented in a random order to prevent order effects, so different versions of the questionnaire were distributed. All respondents evaluated all six transport pricing measures.

Table 5.1. Design and descriptions of evaluated policy measures

	Reduce car use	Change car ownership
Push	increase of road tax with €500 when annual kilometrage >16,000 a year	increase of tax on purchase of new cars with €1,000 for cars using 1 litre fuel or more to drive 13 kms
Pull	decrease of road tax with €500 when annual kilometrage <10,000 a year	decrease of tax on purchase of new cars with €1,000 for cars using 1 litre fuel or less to drive 17 kms
Combination push/ pull	increase of road tax with €500 when annual kilometrage >16,000 a year; decreased of road tax with €500 when annual kilometrage <10,000 a year	increase of tax on purchase of new cars with €1,000 for cars using 1 litre fuel or more to drive 13 kms; decrease of these taxes with €1,000 for cars using 1 litre fuel or less to drive 17 kms

Table 5.2 Fairness principles

Fairness principle	Item in questionnaire
	if this policy is implemented, ….
1. being financially worse off	my financial situation will get worse
2. being worse off than others	I will be worse off compared to others
3. equality	everybody will be affected to the same extent
4. p.o. proportional to income	people with low incomes will be affected less than people with high incomes
5. p.o. proportional to contribution to problems	people who cause problems (e.g., congestion, pollution) will be affected most strongly
6. environmental justice	nature, the environment and future generations will be protected

p.o. = policy outcomes

Measurement of fairness, acceptability, and evaluation of fairness principles

After the description of each policy measure, respondents indicated how fair the policy measure was to them ('How fair is this policy measure to you?'; scores could range from 1 -very unfair- to 7 -very fair-). Next, respondents indicated to what extent they thought six fairness principles were applicable to the policy measures (e.g., 'if this policy measure would be implemented, my financial situation will get worse'; scores could range from 1 -strongly disagree - to 7 -strongly agree-) (see Table 5.2). Finally, respondents indicated how acceptable the policies were to them ('How acceptable is this policy measure to you?'; scores could range from 1 –very unacceptable- to 7 -very acceptable-).

On average, all policy measures were considered to be relatively fair and acceptable (see Table 5.3). However, as expected, the overall fairness and acceptability of the six policy measures differed across the six policies (see, Tables 5.3 and 5.4). Following a 2 (car use, car impact) by 3 (push, pull, combination) design, ANOVA's repeated measures revealed two main effects; no significant interaction effects were found. The first main effect, as expected, implied that respondents evaluated policy measures aimed at changing car use as less fair and less acceptable than policy measures aimed at changing car ownership. The second main effect indicated that fairness and acceptability judgements differed for the push, pull and combination policies. Push measures were considered to be less fair and acceptable than pull measures (mean difference on fairness: -.33, $p<.05$; mean difference on acceptability: -.27, $p<.05$) and combination measures (mean difference on fairness: -.26, $p<.05$; mean difference on

Table 5.3 Means and standard deviations of overall fairness and acceptability, and correlation coefficients between overall fairness and acceptability of six transport pricing policy measures

Policy measure	Fairness[1]		Acceptability[1]			
	M	SD	M	SD	r	
Car use, push	3.9	1.72	4.0	1.70	.76	**
Car use, pull	4.5	1.64	4.3	1.70	.79	**
Car use combination	4.3	1.53	4.3	1.48	.83	**
Car ownership, push	4.8	1.56	4.7	1.60	.82	**
Car ownership, pull	4.9	1.37	4.9	1.47	.83	**
Car ownership, combination	5.1	1.46	5.0	1.53	.91	**

[1] Scores could range from 1 (very unfair, very unacceptable) to 7 (very fair, very acceptable)
** p<.001

Table 5.4 ANOVA repeated measures of a 2 (car use; car ownership) by 3 (push; pull; combination) within-subjects design on fairness and acceptability of six policy measures

	F	df1, df2	p
Dependent variable: fairness			
Factor A (car use versus car ownership)	19.58	1, 100	.000
Factor B (push, pull versus combination)	6.11	2, 99	.003
Interaction (Factor A x Factor B)	2.88	2, 99	ns
Dependent variable: acceptability			
Factor A (car use versus car ownership)	19.86	1, 100	.001
Factor B (push, pull versus combination)	7.42	2, 99	.000
Interaction (Factor A x Factor B)	1.27	2, 99	ns

Note: for means and standard deviations, see Table 5.3

acceptability: -.31, p<.001), whereas no significant difference was found between the fairness and acceptability of the pull and combination measures.

Results

Relationship between overall fairness and acceptability

Table 5.3 shows that for all six policy measures, perceived fairness is strongly and positively correlated with the acceptability of transport pricing policies: the more fair a policy measure was considered to be, the more acceptable that policy measures was. Across the six policy measures correlation coefficients between fairness and acceptability varied from .76 to .91.

Relationship between fairness and acceptability judgements and fairness principles

Multiple regression analyses were conducted to analyse the relationships between respondents' evaluation of the extent to which the six fairness principles[1] were met when the transport pricing policy measures would be implemented and the perceived overall fairness and acceptability for each policy measures separately. The six fairness principles explained between 34% and 46% variance in the overall fairness of the six transport pricing policies (see Table 5.5). The fairness principle 'environmental justice' significantly contributed to the explanation of the overall fairness of all six policy measures. The beta-coefficients indicate strong and positive relationships, implying that all six policy measures were considered to be more fair when people expected nature, the environment and future generation to be protected. The fairness principle 'equality' contributed significantly to the explanation of the overall fairness of five out of six

policy measures. All policy measures were considered to be more fair if the policy measure affected everybody equally; this relationship, however, was weak and not significant for the policy measure 'car use, pull'. The fairness principle 'being worse off than others' significantly contributed to the explanation of the variance in overall fairness of the policy measures were considered to be less fair when respondents expected to be worse off than others after their implementation. For two policy measures (viz., 'car use, combination' and 'car ownership, pull'), the fairness principle 'being financially worse off' was significantly related to overall fairness judgements: respondents judged these policy measures as less fair when they expected their financial situation to deteriorate. In case of two policy measures ('car use, push'; 'car use, combination'), the evaluation of the fairness principle 'policy outcomes proportional to contribution to problems' significantly added to the explanation of the variance in its perceived fairness. Respondents considered these policy measures to be more fair when they more strongly believed that the policy measures more strongly affected people who contributed strongly to problems. Finally, the fairness principle 'policy outcomes proportional to income' significantly contributed to the explanation of the overall fairness of the policy measures 'car use, pull' and 'car ownership, pull'. The perceived fairness of the policy measure 'car use, pull' was lower when respondents expected low income groups to be less strongly affected than high income groups. For the policy measures 'car ownership, pull' the direction of this relationship was the other way around: overall fairness was higher when respondents expected low-income groups to be less strongly affected than high-income groups.

The six fairness principles explained between 40% and 56% variance in the perceived acceptability of the policy measures (see Table 5.6). As for overall fairness, the fairness principle 'environmental justice' significantly contributed to the explanation of the variance in the acceptability of all six policy measures: if respondents expected nature, the environment and

Table 5.5 Regression of overall fairness of six policy measures on evaluation of six fairness principles

	Car use			Car ownership		
	push	pull	comb	push	pull	comb
	β	β	β	β	β	β
1. being financially worse off	.10	.01	-.29 *	-.11	-.35 *	.01
2. being worse off than others	-.43 **	-.26 *	-.01	-.08	.07	-.27 *
3. equality	.18 *	.09	.23 *	.37 **	.37 **	.36 **
4. p.o. proportional to income	-.13	-.25 *	-.06	.14	.20 *	.04
5. p.o. proportional to contribution to problems	.23 *	.14	.22 *	-.11	.09	.05
6. environmental justice	.31 **	.39 **	.30 *	.52 **	.39 **	.49 **
explained variance (%)	43 **	34 **	35 **	46 **	37 **	45 **

p.o. = policy outcomes; *p≤.05; **p≤.001

Table 5.6 Regression of perceived acceptability of six policy measures on evaluation of six fairness principles

	Car use			Car ownership		
	push	pull	comb	push	pull	comb
	β	β	β	β	β	β
1. being financial worse off	.09 *	-.06	-.11	-.03	-.35 *	.02
2. being worse off than others	-.35 **	-.23 *	-.23 *	-.16	-.02	-.24 *
3. equality	.20 *	.19 *	.30 **	.33 **	.36 **	.35 **
4. p.o. proportional to income	-.02	-.18	.06	.02	.26 *	.03
5. p.o proportional to contribution to problems	.26 *	.18	.21 *	.08	.08	.10
6. environmental justice	.44 **	.38 **	.40 **	.50 **	.46 **	.45 **
explained variance (%)	56 **	40 **	47 **	47 **	44 **	44 **

future generations to be protected, they evaluated all six policy measures as more acceptable. Also, the fairness principle 'equality' significantly contributed to the explanation of the variance in acceptability judgements for all six policy measures. All six policy measures were more acceptable if respondents expected that everybody would be equally affected by the policy measures. The acceptability judgements of four policy measures were significantly lower when respondents expected to be worse off than others (viz., 'car use, push'; 'car use, pull'; 'car use, combination'; 'car ownership, combination'). In case of two policy measures ('car use, push'; 'car use, combination'), the fairness principle 'policy outcomes proportional to contribution to problems' significantly added to the explanation of the variance in acceptability. Respondents considered these policy measures to be more acceptable when they more strongly believed that the policy measures affected people in proportion to their contribution to car-related problems. Finally, the fairness principles 'being financially worse off' and 'policy outcomes proportional to income' contributed significantly to the explanation of the acceptability of the 'car ownership, pull' measure: this policy measure was less acceptable when respondents expected to be worse off financially and when respondents expected low-income groups to be affected less strongly than high-income groups after its implementation.

Overall, the regression analyses showed that the fairness principles 'environmental justice' and 'equality' were systematically and consistently related to the overall fairness and acceptability of the six policy measures. For the fairness principles 'being financially worse off', 'being worse off than others', 'policy outcomes proportional to income' and 'policy outcomes proportional to contribution to problems' no consistent relationships with overall fairness and acceptability of all six policy measures were found.

Discussion

In this paper, we studied which fairness principles determine the overall fairness and acceptability of transport pricing policies. Six fairness principles that are potentially relevant in this respect were identified: (1) being financially worse off than before policy implementation, (2) being worse off than others after policy implementation, (3) equality, (4) policy outcomes proportional to income, (5) policy outcomes proportional to one's contribution to problems and (6) environmental justice. To test the robustness of our results, we examined the extent to which these six fairness principles determined the overall fairness and acceptability of six policies measures that were expected to differ on overall fairness and acceptability. Indeed, the overall fairness and acceptability of the six policy measures differed. As expected, policies aimed at changing car use were evaluated as less fair and less acceptable than policy measures aimed at reducing the negative environmental impact per car. Also, push measures were generally considered to be less fair and acceptable than pull and combination measures.

First, we examined the correlation between overall fairness and acceptability of the six policy measures. As expected, all six policy measures were more acceptable when respondents considered them to be more fair. This is in line with other studies and indicates that fairness in indeed an important factor for the acceptability of transport pricing policies (see also, Bamberg & Rölle, 2003; Jakobsson et al., 2000; Eriksson et al., 2006; 2008a).

Second, we assumed that the overall fairness and acceptability of transport pricing policies depend on judgments on the distributions of the expected costs and benefits of these policies, reflecting different fairness principles. The results showed a clear pattern: two out of six fairness

principles were systematically related to the overall fairness and acceptability of all six transport pricing policies, namely, environmental justice and equality. Overall, the policy measures were considered to be most fair and acceptable when future generations, nature and the environment were protected. With one exemption, equality was systematically related to the overall fairness of and acceptability of all transport pricing policies. Also, for some policy measures, other fairness principles were more stronger related to the overall fairness and acceptability than the fairness principle equality. This indicates that the overall fairness and acceptability of transport pricing policies is strongly related to the fairness principle environmental justice and, to a lesser extent, to equality. This is in line with our expectations and with results of previous studies (Clayton, 2000; e.g., Messick & Schell, 1992). Distributions of policy outcomes on the basis of environmental justice are probably preferred because these benefit the collective as well as individuals (see also, Messick & McClintock, 1968; Schwartz, 1977; Wade-Benzoni & Tost, 2009b). Environmental justice in aimed at reducing collective problems. Hence, our results suggest that reducing collective problems related to car use is considered to be very important, which is in line with previous studies (e.g., see Schuitema et al., 2010 ;Chapter 3 of this thesis).

Two fairness principles that typically reflect egoistic concerns (i.e., being financially worse off, being worse off than others) were related to the overall fairness and acceptability of some policy measures only. Hence, fairness principles reflecting egoistic concerns seem to be related to the overall fairness and acceptability of a few policy measures only, but not to any transport pricing policy. Collective considerations (as reflected in environmental justice and equality) appear to be more important for the overall fairness and acceptability of transport pricing policies.

The two fairness principles reflecting equity, that is, policy outcomes proportional to income and policy outcomes proportional to contribution to problems, were also related to the overall fairness and acceptability of a few policy measure only. In our sample, people with high incomes and high annual kilometrage were somewhat overrepresented, which indicates that in general respondents would probably be more negatively affected when the highest income groups and those who cause problems are most strongly affected. If respondents would be particularly concerned with positive outcomes for themselves they would probably not favour both fairness principles reflecting equity. However, our results show the opposite: in case the overall fairness and acceptability of policy measures were related to equity principles, overall fairness and acceptability were higher when people expected low income groups to be less strongly affected than high-income groups and when those who cause problems would be most strongly affected. This supports our previous conclusion that egoistic concerns are not strongly and systematically related to overall fairness and acceptability of transport pricing policies.

Overall, in line with our expectations, environmental justice and equality were systematically related to overall fairness and acceptability of all policies, irrespective of the differences in overall fairness and acceptability for the six policy measures. So, our study suggest that despite differences in costs and benefits of different policies, fairness and acceptability depend most strongly and consistently on environmental justice and equality, albeit to a lesser extent. The overall fairness and acceptability of some policy measures were related to the fairness principles being financially worse off, being worse off than others, policy outcomes proportional to income and policy outcomes proportional to contribution to problems, but no systematic pattern of results was found for all six policy measures. We did not detect any logic in the conditions under which the other four fairness principles did or did not predict overall fairness

and acceptability of the transport pricing policies included in this study. Future research is needed to study under which conditions these fairness principles are likely to play a key role for the overall fairness and acceptability of policy measures.

The fairness principle environmental justice was most strongly related to the fairness and acceptability of all the six policy measures. This may be explained by the specific policy measures that were evaluated in this study: all six policy measures were aimed at improving environmental quality. Future studies should test whether our results can be generalised to other environmental policies: protecting nature, environment and future generations may well be important for the fairness and acceptably of any policy that aims to improve the environmental quality (see also, Clayton, 2000).

Our results can probably not be generalised to policies in general, in particular when the relevant policies are not directly aimed at improving environmental quality. Some policies, including transport pricing policies, are not aimed at reducing the environmental impact of transport in particular, but are for example aimed at improving accessibility. When the main objective of a policy measure is not aimed at improving environmental quality, the fairness principle environmental justice is probably less predictive of overall fairness and acceptability. Future studies are needed to test this assumption.

Generally, people with a high income, educational level and annual kilometrage were slightly overrepresented in our sample. However, we think it is unlikely that the overrepresentation of people with high incomes, educational levels and annual kilometrage affected our results, as our key variables were not related to income, educational level and annual kilometrage (see also, Jaensirisak et al., 2005; Ubbels, 2006). Furthermore, our sample consisted of car users only, which means that we cannot generalise our results to the general Dutch population. From a policy maker's point of view, it is relevant to understand which fairness principles underlie overall fairness and acceptability judgements of car users in particular, because especially car users generally oppose to the implementation of transport pricing policies (Jaensirisak et al., 2005). If the aim is to increase fairness and acceptability for transport pricing policies, our results indicate that policy makers should aim to design policies that meet the fairness principles equality and environmental justice. An example of a policy that meets the fairness principle environmental justice is increasing taxes on cars with high emissions levels. Another option is allocating the revenues of pricing policies in such a way that outcomes are distributed equally or that nature, the environment and future generations are protected via the allocation of revenues. For example, nature, the environment and future generations can be protected when the revenues of transport pricing policies are invested in the development of more energy-efficient cars or to improve public transport. Another practical implication of our study concerns the communication about the intended or expected effects of transport pricing policies. Communication about transport pricing policies often focuses on reducing congestion or improving accessibility (e.g., Dutch Ministry of Transport, 2007). Our results indicate that communication on effects on environmental quality may well increase overall fairness and acceptability of transport pricing policies.

[1] Overall, the six fairness principles did not strongly or systematically correlate. However, strong correlations (between .35 and .71; $p<.001$) were found between the evaluation of the fairness principles 'environmental justice' and 'policy outcomes proportional to contribution to problems' for all six pricing measures. Furthermore, strong correlations (between .51 and .81, $p<.001$) were also found between the evaluation of the fairness principles 'being worse off than others' and ' being financially worse off' for all six measures.

Chapter 6
General discussion

Introduction

Many believe that it is important to reduce car use and car ownership to mitigate the negative impacts of car traffic. Transport pricing policies are believed to be effective to manage travel demand, and therefore, their implementation is frequently considered. However, lack of public support for transport pricing policies often hinders their implementation. The aim of this thesis is to understand which factors affect the acceptability of transport pricing policies. We defined acceptability as an attitude towards transport pricing policies, that is, acceptability reflects a psychological tendency that is expressed by evaluating a transport pricing policy with some degree of favour or disfavour (cf., Eagly & Chaiken, 1993; 2007). We found that acceptability is strongly related to personal outcome expectations, that is, the extent to which people expect to be better or worse off after the implementation of transport pricing policies (Chapter 3). This suggests that acceptability can indeed be regarded as an attitude towards transport pricing policies.

The acceptability of transport pricing policies typically reflects a social dilemma: on the one hand, individuals are better off when they safeguard the individual benefits and evaluate transport pricing policies as unacceptable, but all individuals are better off in the long term when they try to safeguard collective outcomes and evaluate transport pricing policies as acceptable. According to the Greed-Efficiency-Fairness (GEF) hypothesis (Wilke, 1991), people are *a-priori* 'greedy' in a social dilemma, that is, they focus on maximising their individual outcomes. This suggests that the acceptability of transport pricing policies is low, because people do not want to give up the advantages of travelling by car or pay higher prices for travelling by car. Compensating the negative individual outcomes of car use may increase the acceptability of pricing policies. In Chapter 2, we studied whether compensating car users for negative consequences by allocating the revenues of transport pricing to individual car users indeed affects acceptability levels.

The GEF-Hypothesis states that people do not always act greedy, because they also have the desire to preserve collective resources ('efficiency'), and the desire to distribute the outcomes of policies fairly ('fairness'). Hence, we expected that when people are convinced of the efficiency and fairness of policies, the acceptability of these policies might increase. In Chapter 3, we studied the relative importance of expected individual and collective outcomes of transport pricing policies for their acceptability, the latter reflecting efficiency concerns. In Chapter 4, we examined whether and why acceptability of transport pricing policies increases after they have been implemented. More specifically, we investigated to what extent the expected individual and collective outcomes change after the implementation of a transport pricing policies, and whether this results in changes in the acceptability of these policies. Chapter 5 focuses on the relationship between fairness and acceptability by examining which distribution of the outcomes of pricing policies is most strongly related to overall fairness and acceptability of transport pricing policies.

In this final chapter, we give an overview of the main findings that were presented in this thesis. Furthermore, theoretical, methodological, and practical implications of the studies reported are discussed.

Compensating for negative consequences by revenue allocation

The GEF-Hypothesis states that people primarily focus on maximising their own outcomes. Therefore, we hypothesised that the acceptability of transport pricing policies will be higher when car users are compensated for the negative individual consequences of these policies via revenue allocation. In line with our hypothesis, we found that transport pricing policies are most acceptable when revenue allocations benefit individual car users. More specifically, we found that transport pricing policies are most acceptable when revenues are used to benefit car users directly (viz. decrease or abolish fuel and vehicle taxes) rather than when revenues are allocated to public transport or general public funds. This is comparable with results of other studies on the effects of revenue use on the acceptability of transport pricing policies (e.g., Schade & Schlag, 2003), and on the acceptability of pricing policies that promote energy conservation (Steg et al., 2006).

Based on our results, one can conclude that revenues of transport pricing policies should be used to reduce car-related taxes in order to increase the acceptability of these policies. However, pricing policies may be less effective when the revenues are used to reduce car-taxes. For example, commuters indicated to reduce their car use more when revenues of a flat kilometre charge would be allocated to decrease labour taxes than when they were allocated to decrease car-related taxes (Schuitema, Steg, & Vlek, 2007). Thus, transport pricing policies may be more acceptable when revenues are allocated to benefit car users, but they may be less effective as compared to when revenues are not allocated to benefit individual car users. It is important to consider the expected effects of transport pricing policies on car-related problems as well, as the results of Chapter 3 and 4 indicated that the acceptability of transport pricing policies is higher when these policies are perceived to be effective in reducing these problems.

From an economical point of view, using revenues to decrease car-related taxes is not the most efficient hypothecation of revenues, because the total welfare benefits may not be optimal or even decrease (see also, Ubbels, 2006). From a psychological point of view, using revenues to decrease car-related taxes is not optimal either, because this signals two contradicting messages to car users. On the one hand, people are directly charged for using their car, which is potentially very effective in changing their car use, because undesired behaviour (car use) is directly linked to an incentive (charge) (cf., Geller, 1989). On the other hand, by allocating revenues to reduce car-related taxes, the government promotes the possession and use of a car by means of tax reductions, which may signal that the government approves of car driving. In conclusion, earmarking the revenues to benefit car users can increase the acceptability of policy measures. However, the effectiveness and efficiency of these revenue allocations should be taken into account as well, and these are probably not optimal in this case.

An interesting finding of the studies in Chapter 2 is that the effect of revenue allocation on the acceptability of transport pricing policies depended on the research design used. In the first two studies, we examined how revenues use affected the acceptability of two transport pricing policies when a reference was made to a specific policy measure, whereas in the third study, single revenue allocations were evaluated without a reference to a specific policy measure. When revenue allocation was explicitly linked to a detailed description of a pricing policy, investing in infrastructure was not very acceptable. In contrast, when revenue allocation was not connected to a specific policy measure, investing revenues in infrastructure was considered to be acceptable. Apparently, people found investments in infrastructure not acceptable when they

realised they had to pay themselves for these investments. This implies that research designs can significantly affect the outcomes of a study. This should be carefully considered when studying revenue use. One should choose research designs that best fit the aim of the particular study. If the aim is to examine differences in the evaluation of a specific topic such as revenue allocation, a reference to the context may not be very important. In that case, revenue allocations can be presented without a link to a pricing policy. However, when the aim is to examine the evaluation of a pricing policy as a whole, including revenue allocation, a reference to the context of a transport pricing policy is necessary.

Increasing efficiency

Acceptability and expected effects of transport pricing policies

The GEF-Hypothesis states that people do not always try to maximise their own outcomes, because they also have the desire to preserve collective resources ('efficiency'), and thus consider the interests of the collective. Indeed, our results indicate that concerns with efficiency are highly relevant for acceptability (Chapter 3). We found that acceptability of transport pricing was mainly determined by the expected effects on car-related problems (viz., congestion and environmental problems), and hardly to the expected effects on one's own car use, which typically reflects an individual outcome. In Chapter 3, we found that the acceptability of transport pricing policies increases because people expect reductions in collective problems. These collective benefits may also benefit individual car users, for example when travel times or noise levels decrease. This suggests that acceptability can be strengthened by stressing that transport pricing decreases car-related problems, because people care about their own and the collective interest. This conclusion is in line with a study by De Groot and Steg (2006) that revealed that individual quality of life would hardly change when transport pricing policies would be implemented, because the negative effects (e.g., deteriorations in comfort, money and freedom) were compensated by positive effects (e.g., improvement of environmental quality).

The outcomes of a policy depend on the specific objective of a policy. For example, a congestion charge will particularly reduce traffic jams, while environmental taxes will typically reduce environmental problems and not congestion. We suggested that acceptability of a particular policy depends on the extent to which that policy will have the specific expected effects. Indeed, we found that when the aim of a policy is to decrease the impact of car traffic on the environment, acceptability is most strongly related to the expected environmental effects of these policies, but when a policy is mainly aimed at reducing congestion, acceptability is most strongly related to the expected effects on congestion levels.

Chapter 3 and Chapter 4 revealed that transport pricing policies were more acceptable when people expected to reduce their own car use. In addition, results in Chapter 4 show that also after the implementation of a transport pricing policy, acceptability was higher when people had reduced their car use. These results are in contrast with a study of Jakobsson, Fujii, & Gärling (2000), which showed that acceptability decreased when people expected reductions in their own car use. An explanation may be that Jakobsson and colleagues did not included expected effects of policies on collective problems in their model to predict acceptability. Our results suggest that transport pricing policies are acceptable when the problems caused by car use are expected to reduce, even though this may have some negative consequences for individuals.

Differences in acceptability before and after the implementation of transport pricing policies

We hypothesised that the acceptability of transport pricing policies may increase after their implementation because people experience the positive effects of the policy, that is, they perceive that problems actually decrease. We tested this hypothesis in Chapter 4. We first examined the differences between the expected and perceived effects of a congestion charge in Stockholm (see also Box 1.2). We found that inhabitants of Stockholm indicated that congestion, parking problems, and pollution had decreased more after the implementation of the charge than they had expected beforehand, and that financial costs were lower after the charge than was expected before the implementation. Thus, overall, inhabitants of Stockholm were more positive about the effects of the congestion charge after its implementation as opposed to beforehand. We found that acceptability increased after the implementation of the congestion charge as well.

Second, we examined the relationship between the acceptability of the charge and the expected effects before its implementation and the relationship between the acceptance and the perceived effects after its implementation. Before the implementation of the congestion charge, acceptability judgements were determined by the expected effects on one's own car use and travel costs, whereas the expected effects on one's own car use and parking problems predicted acceptance judgements after the charge was implemented. So, after the charge was implemented, people more strongly focused on the positive consequences of the charge (i.e., less parking problems), while before the trial, they particularly focused on the negative (financial) consequences of the charge for themselves. Thus, our results indicate that the inhabitants of Stockholm focus less strongly on the negative effects and more strongly on the positive effects of the congestion charge after the charge was implemented than beforehand.

In conclusion, we found that, as opposed to before the implementation of the charge, inhabitants of Stockholm considered the charge to result in more positive consequences, and they focused more strongly on the positive consequences after the implementation of the charge. These results suggest that the acceptability of the charge was higher after its implementation because inhabitants of Stockholm experienced positive consequences of the charge, confirming the hypothesis that is often posed in the literature (Jaensirisak et al., 2005; Odeck & Bråthen, 1997; 2002; Rienstra et al., 1999; Schade & Schlag, 2000; Schlag & Teubel, 1997; Stockholmförsöket, 2006; Tretvik, 2003; Winslott-Hiseliu et al., 2008). Other studies also suggest that public support for structural changes increases after positive experiences with these changes. For example, it was shown that the acceptability for building wind energy turbines was higher for those who perceived benefits from these turbines after the turbines were built (Wolsink, 2007). Also, driver support systems aimed at increasing safety, efficiency and comfort during driving were more acceptable after people experienced the advantages of such systems (Brookhuis, Cornelie, Hof, van Arem, & Hoedemaeker, 2009). In conclusion, the acceptability of structural changes is likely to increase when people have positive experiences with them.

One may argue that the acceptance transport pricing policies after its implementation is always higher than their acceptability before the implementation, even when acceptability is initially low. However, our results suggest that this is only true when people experience the positive effects of the policy. When effects are less positive than expected, acceptability levels will probably not increase after the implementation of a policy. For example, Schlag en Teubel

(1997) argued that a toll ring in Stuttgart was less acceptable after its implementation due to a lack of positive experiences with this policy measures. Consequently, an important precondition for increased acceptability over time is that people actually experience the positive effects of policies.

Fair and acceptable distribution of policy outcomes

The GEF-Hypothesis states that people do not always have the tendency to maximise their own outcomes, because they have a desire to distribute outcomes of a policy fairly as well. We assumed that the overall fairness and acceptability of transport pricing policies depend on different fairness principles, that is, different evaluations of the distribution of policy outcomes. The GEF-Hypothesis states that a fair distribution of policy outcomes implies an equal distribution of the costs and benefits (Wilke, 1991). However, distributions based on other fairness principles may be relevant for the overall fairness and acceptability of transport pricing policies as well. In Chapter 5, we identified six fairness principles, reflecting different distributions of policy outcomes, that are potentially relevant for the overall fairness and acceptability of transport pricing policies: (1) being financially worse off than before policy implementation, (2) being worse off than others after policy implementation, (3) equality, (4) policy outcomes proportional to income, (5) policy outcomes proportional to one's contribution to problems and (6) environmental justice. We studied the relative importance of these six fairness principles for the overall fairness and acceptability of transport pricing policies. To test the robustness of our results, six policies measures that differed in overall fairness and acceptability were evaluated.

In general, two fairness principles were found to be systematically related to the overall fairness and acceptability of transport pricing policies. That is, overall fairness and acceptability was higher when these policies protected nature, the environment and future generations (reflecting environmental justice) and, to a lesser extent, when these policies were believed to guarantee an equal distribution of the outcomes (equality). Environmental justice reflects a concern with collective considerations, because collective resources are preserved (Clayton, 2000; Wade-Benzoni & Tost, 2009a). Equality is usually also associated with a concern with collective outcomes, because individuals or groups will be equally affected (Lerner, 2003; Schwartz, 1977). Interestingly, the fairness principles that typically reflected egoistic concerns (i.e., being financially worse off and being worse off than others) were not systematically related to the overall fairness and acceptability of the six transport pricing policies. This suggests that the overall fairness and acceptability of some transport pricing policies is not systematically related to fairness principles merely reflecting egoistic concerns, but that environmental justice and equality are more important for the overall fairness and acceptability of transport pricing policies in general. So, the results of Chapter 5 suggest that the overall fairness and acceptability of transport pricing policies is most consistently related fairness principles reflecting collective considerations, which is in line with previous studies (e.g., De Groot & Steg, 2009a; Eriksson et al., 2006).

Of course, environmental justice and equality may also reflect self-interest to some extent, that is, individuals may also benefit when policy outcomes are distributed on the basis of environmental justice or equality. For example, when nature, the environment and future generation are protected, individuals may benefit from improved air quality. Equal distributions

of policy outcomes allows people to justify allocating a certain amount of the outcomes to themselves, without feeling guilty of treating others unfairly (Messick & Sentis, 1979b; Messick & Schell, 1992).

A distribution of policy outcomes based on environmental justice is typically aimed at reducing collective problems related to car use. Overall, the fairness principle environmental justice was shown to be the most important determinant of acceptability and overall fairness of six policy measures. The results in Chapter 5 imply that acceptability (and fairness) of policies is most determined by the extent to which people expect collective car-related problems to reduce, which aligns with the results in Chapters 3 and 4.

Our finding that the fairness principle environmental justice was most strongly related to fairness and acceptability of all six policy measures may be explained by the specific policy measures that were evaluated in this study: all six policy measures were particularly aimed at improving environmental quality. One policy measure focused on reducing car use by either increasing costs when people's annual mileage was above average or by decreasing costs when people's annual mileage was below average. The other policy measure focused on changing car ownership by decreasing costs for those who would purchase an energy-efficient car or increasing costs for those who would purchase an energy-inefficient car. Environmental justice may be particularly important for the acceptability of policies that aim to improve the environmental quality. This reasoning is supported by the results reported in Chapter 3, which indicate that the environmental effects of transport pricing policies were particularly considered to be important when the policies aimed to reduce environmental problems. It is plausible that our results can be generalised to other environmental policies, that is, protecting nature, environment and future generations will probably be important for the overall fairness and acceptably of policies that aim to improve the environmental quality in general (see also, Clayton, 2000), while environmental justice is probably less predictive of overall fairness and acceptability of policies outside the environmental domain. Future studies are needed to test these hypotheses.

Theoretical implications

We proposed a theoretical framework to explain the acceptability of transport pricing policies: the Greed-Efficiency-Fairness Hypothesis (Wilke, 1991). The GEF-Hypothesis states that people do not always try to maximise their own outcomes ('greed'), but they also have the desire to preserve collective resources ('efficiency') and to distribute outcomes of policies fairly ('fairness'). The results of this thesis indicate that 'greed', 'efficiency', and 'fairness' are all related to the acceptability of transport pricing policies. This indicates that the GEF-Hypothesis is a useful theoretical framework to explain the acceptability of transport pricing policies.

In Chapter 3, we examined the relative importance of 'greed' and 'efficiency' for the acceptability of transport pricing policies. We found that that reducing car-related problems was more strongly related to the acceptability of transport pricing policies than the expected effects on one's own car use. This result supports the GEF-Hypothesis that people do not always focus on their own outcomes, but they also have the desire to preserve collective resources.

The GEF-Hypothesis assumes that a fair distribution of outcomes implies an equal distribution of policy outcomes (Wilke, 1991). An equal outcome distribution is assumed to reflect collective as well as individual considerations, that is, equal distribution will guarantee

that groups or individual will not be affected disproportionally and that individuals will get a certain amount of outcomes without feeling guilty of treating other unfairly (e.g., Messick & Schell, 1992; Schwartz, 1977). In Chapter 5, we studied the relative importance of fairness principles that reflect collective considerations (including equality) and fairness principles that reflect egoistic concerns. In line with the GEF-Hypothesis, equality was indeed important for the overall fairness and acceptability of transport pricing policies. However, the fairness principle environmental justice was found to be most strongly related to overall fairness and acceptability judgements. Therefore, our results suggest that equality is not always the most important fairness principle that predicts acceptability judgements.

In this thesis, 'greed', 'efficiency' and 'fairness' were studied separately in relation to the acceptability of transport pricing policies. Also, the relative importance of own outcomes ('greed') and collective outcomes ('efficiency' and 'fairness') for acceptability was studied. Future research should study the relative importance of 'greed', 'efficiency' and 'fairness' for the acceptability of transport pricing policies in one study.

Methodological implications: scenario versus real-life studies

In Chapter 2, 3 and 5, we used scenario studies to examine the acceptability of transport pricing policies, whereas in Chapter 4, we studied the acceptability of a policy that was actually implemented, that is, the congestion charge in Stockholm. All studies revealed that acceptability of transport pricing policies was low before the policies were implemented. Also, people were sceptical about the effects of transport pricing policies on car-related problems as well as on their own situation (e.g., own car use, travel costs) (Chapter 3 and 4). Interestingly, with respect to people's expectations about the consequences of transport pricing policies, the results in Chapter 3 and 4 are comparable: before transport pricing policies are implemented people hardly expect changes in, for example, congestion and pollution levels. Furthermore, the results of Chapter 3 and 4 both suggest that the acceptability of transport pricing policies is higher when people expected to change their own car use. Apparently, respondents are well able to understand and visualise the consequences of scenarios of transport pricing policies that reflect hypothetical policies. Hence, both scenario studies and real-life studies are a valid and useful approach to examine which factors are related to the acceptability of transport pricing policies before they are implemented.

The results in Chapter 3 and 4 differed with respect to the relative importance of the expected consequences of transport pricing policies for their acceptability. In Chapter 3, the acceptability of transport pricing policies was most strongly related to the expected reductions in car-related problems, whereas the effects on car-related problems did not predict the acceptability of the congestion charge in Stockholm before its implementation (Chapter 4). Apparently, when transport pricing policies are actually implemented, people focus more strongly on their own outcomes (e.g., car use, travel costs) than when they evaluate hypothetical transport pricing policies. Consequently, people may consider collective interests somewhat more strongly when evaluating hypothetical transport pricing policies than when they evaluate policies before they are actually going to be implemented.

Scenario studies are generally very useful to understand which factors affect the acceptability of policies before they are implemented. The added value of studying policies that are actually implemented is that changes in acceptability can be measured and understood as

well. In Chapter 4, we have made a first attempt to study differences in acceptability before and acceptance levels after a policy implementation *and* factors that explain these differences. Our results suggest that it is very important to monitor how and why acceptability levels change when pricing policies are implemented.

Some limitations of our studies should be taken into account when comparing the scenario studies in Chapter 2, 3 and 5 with the real-life study in Chapter 4. First, a congestion charge was studied in Chapter 4, whereas in Chapters 2, 3 and 5 other types of transport pricing policies were examined. Moreover, our studies took place in different counties, that is, Chapter 4 is based on Swedish data and the Chapters 2, 3, and 5 on Dutch data. Therefore, our conclusions remain tentative until they are validated by future studies.

Practical implications: guidelines for policy makers

We argued that the acceptability of transport pricing policies can be increased by (i) compensating individuals for the negative consequences of these policies, (ii) highlighting positive effects of transport pricing policies on collective problems, or (iii) increasing the fairness of policies, in particular by stressing the extent to which policies protect nature, the environment and future generations, and guaranteeing that every individual is equally affected.

When the acceptability of transport pricing policies increases because car users are compensated for the negative consequences, for example, by reducing car-related taxes, an appeal is made on their tendency to maximise their own outcomes ('greed'). However, transport pricing policies are probably less effective and efficient when individual car users are financially compensated. Moreover, results indicate that the acceptability of transport pricing policies depends less strongly on the expected and perceived negative consequences of transport pricing policies than on the expected and perceived reductions in collective car-related problems. Therefore, particularly stressing that transport pricing policies have positive effects on collective car-related problems seems to be a good strategy to increase acceptability levels. Our results indicate that people are very sceptical about the effectiveness and fairness of transport pricing policies, which explains why acceptability levels are low. What can policy makers do to increase the odds that transport pricing policies are more acceptable to the public (see also Box 6.1)? One conclusion that can be drawn from the results reported in this thesis is that people consider both their own interests as well as the interests of the collective when evaluating the acceptability of transport pricing policies. Stressing that reducing car-related problems benefits both the collective and individuals reduces the conflict between collective and self-interests (see also, De Groot & Steg, 2009a). For example, it can be explained that reductions in congestion will benefit the collective, but will probably decrease travel times for car users as well. Or, it can be stressed that increasing the environmental quality will benefit the collective including future generations, but is also likely to improve the local air quality and reduce the negative impact of car traffic on health problems. Thus, acceptability will be higher if authorities stress how and why transport pricing policies will result in positive effects on collective car-related problems, and how individual car users will benefit from this too.

Our results indicate that people are very sceptical about the effectiveness and fairness of transport pricing policies, which explains why acceptability levels are low. What can policy makers do to increase the odds that transport pricing policies are more acceptable to the public (see also Box 6.1)? One conclusion that can be drawn from the results reported in this thesis is

Box 6.1 Advise to the Dutch Minister of Transport[1]

On November 30 2007, the Dutch Minister of Transport presented his plans to implement a national kilometre charge (see also Box 1.1). One of the main premises of this presentation was to get public support for the plans. What can we conclude about the public support for the national kilometre charge on the basis of this thesis?

First of all, the Minister focuses on three factors, that is, revenue allocation, the perceived effects and fairness of the kilometre charge. This is an excellent starting point, because these three factors are important factors for the acceptability of pricing policies.

The Minister stressed that the revenues of the kilometre charge will be used to abolish current car taxes. The results of this thesis indicate that public support for the kilometre charge will indeed increase when revenues are returned to the car users. Therefore, this is likely to increase public support for the kilometre charge. However, it is questionable whether reducing car-related taxes will result in stable and long term public support for the policy, because, as a result, the kilometre charge is probably less effective and efficient. Our results suggest that the acceptability of the kilometre charge depends on the extent to which people believe that the charge is effective and efficient. Hence, allocating revenues to abolish existing car taxes may be less acceptable in the long term.

The Minister explains how the kilometre charge will decrease congestion, which is a good starting point. However, he hardly explains how kilometre charge will improve environmental quality, while this seems to be one of the aims of the charge as well (see, Dutch Ministry of Transport, 2007). The results of this thesis indicate that the (expected) environmental effects of the charge should be clearly explained as well, because effects on environmental quality were found to be one of the main factors explaining the acceptability of transport pricing policies. In this respect, the Minister could have made better use of the examples from abroad. Although the Minister indicates that case evidence from abroad shows that people do change their car use after the implementation of pricing policies, he does not explain which positive effects (e.g., on environmental quality, congestion, and accessibility) were achieved. The congestion charges in London and Stockholm would have been good examples to explain the positive consequences of pricing policies for individuals and the collective. Moreover, trials with the kilometre charge, particularly in densely populated areas with serious car-related problems, may increase the acceptability of the kilometre charge as far as people actually experience the positive effects of such trials.

The Minister claimed that the design of the kilometre charge is a fair one, because car use is charged instead of car ownership. This refers to the principle 'the polluter pays', indicating that the more people contribute to problems (e.g. congestion, pollution), the more they pay. The results in this thesis suggest that the polluter pays principle is not considered to be the most fair and acceptable distribution of the costs and benefits of the kilometre charge. We found that distributing the costs and benefit equally among people and, especially, protecting nature, the environment, and future generation were more important fairness principles. Consequently, the Minister should stress how the kilometre charge affects future generations and environmental quality, and how costs and benefits are equally distributed.

[1] Recently, Camiel Eurlings, Dutch Minister of Transport, announced that he is not electable after the national elections in June 2010. We hope this advice is useful for his successor.

that people consider both their own interests as well as the interests of the collective when evaluating the acceptability of transport pricing policies. Stressing that reducing car-related problems benefits both the collective and individuals reduces the conflict between collective and self-interests (see also, De Groot & Steg, 2009a). For example, it can be explained that reductions in congestion will benefit the collective, but will probably decrease travel times for car users as well. Or, it can be stressed that increasing the environmental quality will benefit the collective including future generations, but is also likely to result improve the local air quality and

reduce the negative impact of car traffic on health problems. Thus, acceptability will be higher if authorities stress how and why transport pricing policies will result in positive effects on collective car-related problems, and how individual car users will benefit form this too.

Reducing car-related problems will most likely result in higher acceptability levels when people are aware of the negative consequences of car use (Schade & Schlag, 2003; Steg & Vlek, 1997). Awareness about car-related problems tends to be particularly high in densely populated areas (Jones, 1991b), probably because problems are most visible in these areas. Consequently, the acceptability of transport pricing policies may particularly increase in areas that face serious problems from car traffic, provided that people expect that these policies will indeed decrease car-related problems. So, to increase acceptability levels, transport pricing policies should particularly be implemented in densely populated areas that face serious traffic problems. Moreover, it should be clear to the public that the odds that objectives of transport pricing policies are achieved are high. In this respect, referring to successful examples of the positive effects of transport pricing policies in cities such as Stockholm and London can increase acceptability.

Which objectives transport pricing policies need to achieve in order to be acceptable and effective depends on the particular location in which transport pricing policies will be implemented. We found that acceptability was higher if people expected policies to improve environmental quality or reduce congestion levels (Chapter 3 and 4). Often, policy documents and reports focus primarily on reducing congestion, while improving environmental quality is not the main goal (e.g., Eddington, 2006; see also Box 1.1). Our results suggest that people think transport pricing policies should aim to reduce environmental problems as well. In fact, our results showed that a policy measure mainly aimed at reducing environmental problems was more acceptable than a policy mainly aimed at reducing congestion levels (Chapter 3). Consequently, improving environmental quality is an important goal to legitimise the implementation of transport pricing policies.

Finally, the result in Chapter 4 suggest that the acceptability of transport pricing policies is likely to increase when people perceive and experience positive effects of transport pricing policies. The case study in Stockholm is a good example of how the public opinion can change in favour of a policy after it is implemented. A trial was held during 7 months, which enabled inhabitants of Stockholm to experience the positive and negative effects of a congestion charge. In this respect, it was important that problems indeed decreased during the trial in Stockholm, so that people could actually perceive and experience the positive effects of the congestion charge. Moreover, a compulsory referendum was held after the trial, giving inhabitants of Stockholm a feeling of control over the final decision. The acceptability of transport pricing policies can increase during a trial period, provided that the positive effects of the policy can be perceived and experienced by the public during the trial.

Final remarks

Hopefully, this thesis contributes to the ongoing debate on the implementation of transport pricing policies by providing a better understanding of the factors that are related to the acceptability of transport pricing policies. Our studies show that transport pricing policies are more acceptable when they are effective in reducing car-related problems. However, people should be convinced that the objectives of policy measures will be achieved, and that car-

related problems will actually decrease. Acceptability will increase when people expect to personally benefit from the implementation of transport pricing policies, but also when they expect beneficial effects for the collective, such as improvements in environmental quality or reductions in congestion. The latter may also benefit individuals, for example because the air quality improves or travel time decreases. In order to increase the acceptability of transport pricing policies, politicians should stress the positive effects of the policies on car-related problems, rather than stressing that the negative effects on individual car users are small. Also, acceptability of policy measures will increase when people have the opportunity to experience the positive effects of a policy measure, for example via trials.

Summary

Samenvatting in het Nederlands

Inleiding

Al sinds de jaren ’80 van de vorige eeuw is er in Nederland een discussie gaande over het beprijzen van autogebruik: spitsvignetten, rekeningrijden, expresbanen en een kilometerheffing zijn allemaal plannen geweest van de Nederlandse overheid om de automobilist te laten betalen voor het gebruik van de auto. Totdat het huidige kabinet viel, leek het erop dat in 2012 een kilometerheffing in Nederland zou worden ingevoerd. Nu het kabinet is gevallen, is onduidelijk of deze plannen nog steeds doorgevoerd gaan worden.

De belangrijkste reden waarom in Nederland wordt nagedacht om het verkeer te reguleren via prijsmaatregelen is dat het toenemend autoverkeer voor meer en meer problemen zorgt. In Nederland neemt het totaal aantal auto’s drastisch toe, evenals het aantal kilometers dat per auto wordt gereden: tussen 1995 en 2009 is het aantal auto’s met 34% toegenomen en tussen 1995 en 2006 is het aantal gereden kilometers in personenauto’s met 13% gestegen. Als gevolg hiervan neemt het aantal verkeersgerelateerde problemen toe. Het aantal en de lengte van files neemt bijvoorbeeld toe als ook de uitstoot van schadelijke stoffen. In het algemeen neemt de bereikbaarheid van veel plaatsen af.

Niet alleen in Nederland neemt het aantal auto’s en het aantal gereden kilometers toe: toenemend autobezit- en gebruik is een wereldwijd fenomeen. In veel landen wordt nagedacht over strategieën om het autoverkeer te reguleren en om verkeersgerelateerde problemen op te lossen. Prijsbeleid wordt vaak gezien als een zeer effectieve methode om de problemen van het toenemende autoverkeer te verminderen. Voorbeelden uit het buitenland waar prijsbeleid daadwerkelijk is ingevoerd bevestigen dit beeld: een jaar na de invoering van congestieheffingen in Singapore, Londen en Stockhom blijkt het autoverkeer in deze steden te zijn afgenomen met respectievelijk 16%, 14% en 22%.

Eén van de belangrijkste redenen waarom er al tientallen jaren gediscussieerd wordt over het invoeren van een beprijzingssysteem in Nederland, zonder dat tot daadwerkelijke invoering is overgegaan is een gebrek aan maatschappelijk draagvlak voor prijsbeleid. Ook bij de invoering van beprijzingssystemen in het buitenland blijkt een gebrek aan draagvlak een belangrijk struikelblok te zijn. Zo zijn bijvoorbeeld de plannen om in Edinburgh en Manchester congestieheffingen in te voeren niet doorgegaan omdat inwoners van deze steden in lokale referenda tegen deze beleidsplannen hebben gestemd. Daarom gaat dit proefschrift over factoren die de publieke acceptatie van prijsmaatregelen in verkeer en vervoer beïnvloeden.

Wat zijn de belangrijkste factoren die gerelateerd zijn aan de acceptatie van prijsbeleid in verkeer en vervoer?

Acceptatie van prijsbeleid wordt over het algemeen gezien als een attitude ten opzichte van prijsbeleid. Deze attitude is gebaseerd op de evaluatie van de voor- en nadelen van dit beleid. Er zijn verschillende voor- en nadelen verbonden aan de invoering van prijsbeleid. De nadelen van prijsbeleid in verkeer en vervoer zijn vaak vooral merkbaar voor individuele automobilisten, omdat bijvoorbeeld hun reiskosten stijgen of omdat zij hun autogebruik moeten verminderen. Van de voordelen daarentegen, profiteert in principe de hele maatschappij. Als bijvoorbeeld de files afnemen heeft dat positieve economische gevolgen en een vermindering van de uitstoot van schadelijke stoffen heeft positieve effecten voor de natuur en het milieu in het algemeen. Natuurlijk zullen ook individuele automobilisten profiteren van deze positieve gevolgen van

prijsbeleid in verkeer en vervoer, bijvoorbeeld doordat hun reistijd afneemt of doordat de lokale luchtkwaliteit verbetert.

Omdat de nadelen van prijsbeleid direct door individuele automobilisten worden ervaren en de voordelen vooral positieve gevolgen hebben voor de hele maatschappij, kan de acceptatie van prijsbeleid worden omschreven als een sociaal dilemma. Aan de ene kant is het voor individuele automobilisten aantrekkelijk om prijsbeleid niet acceptabel te vinden, omdat ze de negatieve gevolgen van prijsbeleid (bijvoorbeeld kostenstijging, aantasting van hun autogebruik) willen vermijden. Aan de andere kant wil men dat verkeersgerelateerde problemen worden opgelost. Dit betekent dat men prijsbeleid acceptabel zou moeten vinden, omdat dit bijdraagt aan de oplossing van deze problemen.

Volgens de *Greed–Efficiency-Fairness* (Inhaligheid–Efficiëntie–Rechtvaardigheid) Hypothese spelen drie factoren een rol bij de afweging van voor- en nadelen in een sociaal dilemma. Ten eerste zijn mensen gemotiveerd om hun eigen belang zo goed mogelijk te beschermen door maximale baten en tegen minimale kosten voor zichzelf te behalen. Dit betekent dat de acceptatie van prijsbeleid in verkeer en vervoer kan worden veranderd door automobilisten te compenseren voor de negatieve gevolgen van prijsbeleid, bijvoorbeeld via besteding van de opbrengsten van prijsbeleid. Daarom hebben we in dit proefschrift gekeken naar hoe de acceptatie van prijsbeleid in verkeer en vervoer afhangt van het gebruik van de opbrengsten van dit beleid.

Ten tweede blijken mensen het belangrijk te vinden dat collectieve bronnen (zoals het milieu) beschermd worden. Dit betekent dat de acceptatie van prijsbeleid kan toenemen als mensen geloven dat prijsbeleid positieve gevolgen heeft voor iedereen (het collectief). Met andere woorden, de acceptatie van prijsbeleid zal toenemen als verkeersgerelateerde problemen afnemen, ondanks het feit dat prijsbeleid ook negatieve gevolgen voor henzelf heeft. Deze hypothese hebben we getoetst in dit proefschrift.

Als het zo is dat acceptatie van prijsbeleid hoger is als verkeersgerelateerde problemen worden opgelost, dan zal de acceptatie voor prijsbeleid moeten toenemen als mensen daadwerkelijk positieve effecten van prijsbeleid ervaren. Met andere woorden, de acceptatie van prijsbeleid kan toenemen nadat het beleid is ingevoerd, als men ziet dat het beleid heeft bijgedragen tot een vermindering van de problemen van het autoverkeer. Deze hypothese hebben we onderzocht door een studie te doen in Stockholm waar een proef met prijsbeleid werd gehouden in 2006.

Ten derde blijken mensen het belangrijk te vinden dat de uitkomsten van prijsbeleid op een rechtvaardige manier verdeeld worden. Met andere woorden, de acceptatie van prijsbeleid neemt toe als men dat beleid rechtvaardig vindt. Het is echter niet duidelijk welke verdeling van de uitkomsten rechtvaardig en acceptabel wordt gevonden. De huidige Nederlandse minister van verkeer en vervoer bijvoorbeeld, verdedigt zijn beleid door te zeggen dat het rechtvaardig is dat ‘de vervuiler betaalt’. Dit is één manier om de uitkomsten van prijsbeleid te verdelen. Een andere manier is bijvoorbeeld om iedereen hetzelfde bedrag te laten betalen, of door mensen met lage inkomens minder te laten betalen dan mensen met hoge inkomens. In dit proefschrift hebben we onderzocht wat mensen een rechtvaardige en acceptabele manier vinden om de uitkomsten van prijsbeleid te verdelen.

Hoe hangt acceptatie van prijsbeleid samen met het gebruik van de opbrengsten?

De opbrengsten van prijsbeleid kunnen op verschillende manieren worden gebruikt. In drie verschillende studies hebben we gekeken hoe acceptabel prijsmaatregelen zijn, terwijl de opbrengstdoelen varieerden. Er werden vijf verschillende opbrengstdoelen onderscheiden: de opbrengsten konden (i) naar de schatkist gaan, (ii) worden gebruikt voor het verbeteren van het openbaar vervoer, (iii) worden gebruikt om de wegenbelasting (MRB) af te schaffen, (iv) worden gebruikt om brandstofaccijnzen te verminderen of (v) worden gebruikt om nieuwe wegen te bouwen en bestaande weginfrastructuur te verbeteren.

In de eerste twee studies gaven Nederlandse automobilisten die regelmatig in de file staan voor hun woon-werkverkeer aan hoe acceptabel ze twee verschillende kilometerheffingen vonden: een vlakke kilometerheffing (wat inhoudt dat iedereen evenveel betaalt) en een kilometerheffing waarbij de prijs afhankelijk was van het gewicht van de auto. Alle respondenten lazen dezelfde gedetailleerde beschrijving van de kilometerheffingen. Alleen het opbrengstdoel van de maatregelen werd systematisch gevarieerd voor verschillende respondenten. In de derde studie beschreven we geen specifieke prijsmaatregel, maar gaven respondenten aan hoe acceptabel ze verschillende opbrengstdoelen van prijsmaatregelen vinden. In dit geval beoordeelde iedere respondent de acceptatie van ieder opbrengstdoel.

De belangrijkste conclusie van deze studie is dat prijsbeleid acceptabeler is als de opbrengsten terug worden gegeven aan de automobilist (in het bijzonder als de wegenbelasting wordt afgeschaft of de brandstofaccijnzen worden verminderd). Het is echter de vraag of het teruggeven van de opbrengsten aan de automobilist ook het meest effectief is. Economische theorieën laten zien dat de maatschappelijke welvaart meer toeneemt als de opbrengsten van prijsbeleid worden gebruikt om de inkomstenbelasting te verminderen dan als de opbrengsten direct terug worden gesluisd naar automobilisten. Ook vanuit psychologisch oogpunt is het waarschijnlijk minder effectief om de opbrengsten van prijsbeleid terug te geven aan automobilisten. Aan de ene kant wordt gedrag dat de overheid ongewenst vindt (autorijden) direct gekoppeld aan een kostenstijging. Aan de andere kant geeft de overheid de opbrengsten terug aan de automobilist, wat de indruk kan wekken dat de overheid autorijden helemaal niet zo ongewenst vindt. Er kan geconcludeerd worden dat prijsbeleid acceptabeler is als de opbrengsten worden teruggeven aan de automobilist, maar dit kan wel eens de effectiviteit van dit beleid ondermijnen.

Een andere interessante conclusie uit deze studie is dat in de eerste twee studies automobilisten het helemaal niet acceptabel vinden om de opbrengsten van prijsbeleid te investeren in infrastructuur, terwijl de resultaten van de derde studie laten zien dat automobilisten het zeer acceptabel vinden om in infrastructuur te investeren. Deze verschillende resultaten zijn waarschijnlijk het gevolg van het verschil in onderzoeksopzet in beide studies. In de derde studie werden de opbrengstdoelen niet aan een specifieke prijsmaatregel gekoppeld. Hieruit bleek dat automobilisten het in het algemeen zeer acceptabel vinden als de overheid investeert in infrastructuur voor auto's. In de eerste twee studies onderzochten we hoe de acceptatie van prijsbeleid was gerelateerd aan het gebruik van de opbrengsten, waarbij een expliciete koppeling werd gemaakt tussen de prijsmaatregel en het investeren van de opbrengsten in infrastructuur (en andere opbrengstdoelen). Het lijkt erop dat automobilisten investeren in infrastructuur een stuk minder acceptabel vinden als ze zich realiseren dat zij zelf voor deze investeringen betalen via de prijsmaatregel.

Hoe hangt acceptatie van prijsbeleid samen met verwachtingen over de uitkomsten van dit beleid?

Mensen hebben waarschijnlijk verwachtingen over welke gevolgen prijsmaatregelen voor henzelf en in het verkeer in het algemeen hebben. Zoals eerder uitgelegd heeft prijsbeleid vooral nadelige gevolgen voor individuele automobilisten, omdat autorijden duurder wordt, of wordt ingeperkt, terwijl de positieve gevolgen (zoals minder files, milieuproblemen) merkbaar zijn voor de maatschappij in het algemeen. We hebben onderzocht of acceptatie van prijsmaatregelen vooral afhankelijk is van de verwachte negatieve effecten van dit beleid voor individuele automobilisten (de gevolgen voor hun autogebruik) of van de verwachte positieve effecten voor de maatschappij (de gevolgen voor files en milieu). Daarnaast hebben we gekeken naar de mate waarin mensen in het algemeen verwachten beter of slechter af te zijn als prijsmaatregelen zouden worden ingevoerd. Dit hebben we gedaan door automobilisten die regelmatig in de file staan voor hun woon-werkverkeer te vragen om twee prijsmaatregelen te beoordelen. De ene maatregel was vooral gericht op het verminderen van files (een tolheffing) en de andere maatregel op het verminderen van milieuproblemen (een kilometerheffing waarbij de prijs afhankelijk was van het gewicht van de auto).

Uit het onderzoek bleek dat de respondenten prijsmaatregelen acceptabeler vonden en in het algemeen verwachtten beter af te zijn, als ze dachten dat files en milieuproblemen af zouden nemen, terwijl de mate waarin een prijsmaatregel leidt tot een vermindering van hun eigen autogebruik hierbij geen belangrijke rol speelde. Met andere woorden, prijsbeleid wordt vooral onacceptabel gevonden omdat automobilisten verwachten dat verkeersgerelateerde problemen niet zullen worden opgelost, en niet omdat zij niet bereid zijn hun eigen autogebruik aan te passen.

Dat onze respondenten prijsbeleid acceptabel vonden en verwachtten beter af te zijn als files zouden afnemen is op zich geen opmerkelijk resultaat. Immers, onze respondenten waren automobilisten die regelmatig in de file staan. Het is daarentegen wel opmerkelijk dat ze prijsbeleid acceptabeler vonden en verwachtten beter af te zijn als zij verwachtten dat het prijsbeleid een vermindering van milieuproblemen zou inhouden. Immers, van het verminderen van milieuproblemen zullen de respondenten minder direct profijt hebben dan van een vermindering van files. Blijkbaar vinden automobilisten het oplossen van verkeersgerelateerde problemen belangrijk omdat zij zelf en de maatschappij daarvan zullen profiteren.

Van tevoren hadden we verwacht dat prijsbeleid minder acceptabel zou zijn als automobilisten verwachten dat zij hun eigen autogebruik zouden moeten aanpassen, en ook dat zij in dat geval zouden aangeven slechter af te zijn. Het omgekeerde bleek het geval te zijn: hoe waarschijnlijker automobilisten het vonden dat zij als gevolg van de prijsmaatregelen hun autogebruik gingen verminderen, hoe acceptabeler zij de maatregelen vonden (dit komt overeen met de resultaten van een studie in we in Stockholm deden, zie volgende paragraaf) en hoe beter zij in het algemeen af dachten te zijn. Wellicht zijn automobilisten in principe bereid hun eigen autogebruik aan te passen als ze verwachten dat dit tot een vermindering van verkeersgerelateerde problemen zal leiden. In dat geval kan prijsbeleid worden gezien als een maatregel die hen ondersteunt om hun autogebruik aan te passen, en dus om een bijdrage te leveren aan het verminderen van problemen. Vervolgonderzoek zal uit moeten wijzen of dit een plausibele verklaring is.

Tenslotte hebben we gekeken of de acceptatie van prijsbeleid met verschillende

beleidsdoelen afhankelijk is van verschillende verwachtingen over de uitkomsten van prijsbeleid. De tolheffing heeft bijvoorbeeld vooral tot doel om files te verminderen, terwijl de milieugerelateerde kilometerheffing vooral gericht is op het verminderen van milieuproblemen. Zoals we hadden verwacht, bleek de maatregel die vooral gericht was op het verminderen van files acceptabeler te zijn naarmate mensen verwachtten dat deze maatregel ook minder files tot gevolg zou hebben. De acceptatie van de maatregel die vooral gericht was op het verminderen van milieuproblemen hing het sterkst samen met de verwachte effecten op milieuproblemen. Dit duidt erop dat prijsbeleid meer acceptabel is als mensen verwachten dat het achterliggende beleidsdoel wordt bereikt. Daarom is het belangrijk dat er goed gecommuniceerd wordt hoe waarschijnlijk het is dat prijsbeleid een positief effect heeft op specifieke problemen.

Hoe en waarom veranderen acceptatieoordelen voor en na de invoering van prijsbeleid?

Er wordt vaak aangenomen dat de acceptatie van prijsbeleid toe zal nemen als mensen de voordelen van het beleid daadwerkelijk ervaren. Deze hypothese hebben we getoetst door voor en na een proef met prijsbeleid in Stockholm de inwoners van deze stad een vragenlijst voor te leggen. Tijdens deze proef werd een congestieheffing ingevoerd, wat inhield dat alle voertuigen (met een aantal uitzonderingen) tijdens weekdagen moesten betalen om het centrum van Stockholm in of uit te rijden. De hoogte van de prijs was afhankelijk van het tijdstip van de dag, en het kwam er op neer dat tijdens de spits meer betaald moest worden dan buiten de spits. De proef duurde zeven maanden en vond plaats van 3 januari tot en met 31 augustus in 2006.

In de eerste vragenlijst, die werd afgenomen voordat de congestieheffing werd ingevoerd, vroegen we inwoners van Stockholm aan te geven hoe acceptabel ze de congestieheffing vonden, hoeveel ze verwachtten dat hun reiskosten zouden stijgen, en in welke mate ze een vermindering verwachtten van hun eigen autogebruik, files, milieuvervuiling en parkeerproblemen. Ook vroegen we ze in welke mate ze verwachtten dat het openbaar vervoer in Stockholm drukker zou worden. In de tweede vragenlijst, die na afloop van de congestieheffing werd afgenomen, vroegen we dezelfde respondenten wederom hoe acceptabel ze de congestieheffing vonden, hoeveel hun kosten daadwerkelijk waren gestegen, hoeveel hun autogebruik, files, milieuvervuiling en parkeerproblemen waren afgenomen, en of het openbaar vervoer in Stockholm drukker was geworden.

Ten eerste hebben we gekeken naar het verschil in acceptatie voor en na de invoering van de congestieheffing. Zoals verwacht vonden we dat men de congestieheffing na invoering acceptabeler vond dan van tevoren. Dit komt overeen met resultaten die in andere onderzoeken werden gevonden: de acceptatie van tolheffingen in Bergen, Oslo en Trondheim in Noorwegen en de congestieheffing in Londen, was toegenomen nadat deze maatregelen waren ingevoerd.

Ten tweede hebben we gekeken of de effecten van de congestieheffing die mensen van tevoren verwachtten verschilden van de waargenomen effecten na de invoering van de congestieheffing. Inwoners van Stockholm bleken de stijging van de additionele reiskosten door de invoering van de congestieheffing te hebben overschat: achteraf bleek dat de gemiddelde kosten minder waren gestegen dan van tevoren werd verwacht. Wat betreft de verwachte effecten voor verkeersgerelateerde problemen bleek juist het omgekeerde: na de invoering van de congestieheffing gaven mensen aan dat files, milieuvervuiling en parkeerproblemen in het centrum van Stockholm meer waren afgenomen dan zij van tevoren hadden verwacht. Wat betreft de effecten van de congestieheffing op het eigen autogebruik en de drukte in het

openbaarvervoer bleken de verwachtingen van inwoners van Stockholm voor invoering van de congestieheffing niet te verschillen van de waargenomen effecten na de invoering van deze maatregel. Op basis van deze resultaten kunnen we concluderen dat inwoners van Stockholm over het algemeen positiever zijn gaan denken over de gevolgen van de congestieheffing na invoering ervan. Immers, de negatieve gevolgen (kostenstijging) bleken achteraf mee te vallen, en de positieve effecten (minder files, milieuvervuiling en parkeerproblemen) bleken groter dan van tevoren verwacht.

Ten slotte hebben we gekeken naar de relatie tussen acceptatie en de (verwachte en waargenomen) effecten van de congestieheffing. Zowel voor als na invoering van de congestieheffing bleek de acceptatie van deze maatregel afhankelijk te zijn van de mate waarin inwoners van Stockholm hun eigen autogebruik verminderen na invoering van de maatregel: de congestieheffing werd acceptabeler gevonden als inwoners van Stockholm minder autokilometers zouden maken na invoering van deze maatregel. Het verschil was dat voordat de congestieheffing werd ingevoerd deze maatregel minder acceptabel werd gevonden, als mensen een stijging van hun reiskosten verwachtten, terwijl achteraf de werkelijke kostenstijging niet meer samenhing met de oordelen over de acceptatie van de congestieheffing. In plaats daarvan bleek acceptatie achteraf afhankelijk te zijn van de waargenomen vermindering van parkeerproblemen: hoe meer men aangaf dat de parkeerproblemen in het centrum van Stockholm waren afgenomen, hoe acceptabeler men de congestieheffing na invoering vond.

Concluderend kan worden gesteld dat inwoners van Stockholm na invoering van de congestieheffing meer positieve gevolgen hebben ervaren dat ze van tevoren hadden verwacht, én dat ze zich meer zijn gaan richten op de positieve (oplossing parkeerproblemen) dan op de negatieve consequenties (kostenstijging) van de maatregelen. Dit wijst erop dat de acceptatie van de congestieheffing in Stockholm is toegenomen omdat mensen de positieve gevolgen van deze maatregel hebben ervaren. Meer in het algemeen wijst onze studie erop de acceptatie van prijsbeleid zal toenemen als mensen de voordelen van dit beleid ervaren. Dit betekent ook dat als mensen deze voordelen *niet* ervaren, de acceptatie ook niet toe zal nemen en zelfs kan verminderen. Daarom is het voor de acceptatie van beleid belangrijk dat prijsbeleid op zo een manier wordt ingevoerd dat het publiek daadwerkelijk de voordelen ervan ervaart.

Wanneer is prijsbeleid acceptabel en rechtvaardig?

Verschillende onderzoeken hebben aangetoond dat mensen prijsbeleid acceptabel vinden als ze dit beleid ook rechtvaardig vinden. Maar tot nu toe is het niet duidelijk wat (on)acceptabel en (on)rechtvaardig beleid precies is: hoe moet beleid worden vormgegeven om (on)acceptabel en (on)rechtvaardig gevonden te worden? In dit proefschrift hebben we onderzocht in welke mate de volgende zes verschillende rechtvaardigheidsprincipes gerelateerd zijn aan de mate waarin mensen prijsbeleid rechtvaardig en acceptabel vinden: (i) men is na invoering van een prijsmaatregel slechter af dan van tevoren (ii) men is na invoering van een prijsmaatregel slechter af dan anderen (iii) iedereen wordt in dezelfde mate getroffen door een prijsmaatregel, (iv) een prijsmaatregel treft mensen met een hoog inkomen sterker dan iemand met een laag inkomen, (v) een prijsmaatregel treft mensen die veel bijdragen aan problemen (bijvoorbeeld files, milieuvervuiling) sterker dan iemand die weinig bijdraagt aan deze problemen en (vi) een prijsmaatregel die de natuur, het milieu en toekomstige generaties beschermt.

Het is bekend dat verschillende typen prijsbeleid vaak in meer of mindere mate rechtvaardig en acceptabel worden gevonden. Het doel van deze studie was om na te gaan of dezelfde rechtvaardigheidsprincipes ten grondslag liggen aan rechtvaardigheids- en acceptatieoordelen van prijsbeleid. Daarom hebben we automobilisten zes verschillende prijsmaatregelen voorgelegd, waarvan we veronderstelden dat ze verschillend werden beoordeeld op rechtvaardigheid en acceptatie. Automobilisten gaven voor deze zes maatregelen aan hoe rechtvaardig en acceptabel ze de maatregelen vonden. Ook gaven ze aan in welke mate de maatregelen voldeden aan de zes rechtvaardigheidsprincipes die eerder werden beschreven. Zoals we hadden verwacht, bleken de gemiddelde rechtvaardigheids- en acceptatieoordelen voor de zes prijsmaatregelen inderdaad te verschillen.

Het belangrijkste doel van dit onderzoek was om na te gaan in welke mate de rechtvaardigheidsprincipes samenhingen met de rechtvaardigheids- en acceptatieoordelen van de zes maatregelen. Over het algemeen bleken alle zes prijsmaatregelen rechtvaardiger en acceptabeler te worden gevonden als mensen vonden dat de maatregelen de natuur, het milieu en toekomstige generaties beschermden. Dit rechtvaardigheidsprincipe heeft sterk te maken met het beschermen van collectieve bronnen en het oplossen van (milieu)problemen. Met andere woorden, de resultaten van deze studie sluiten aan bij onze vorige conclusies: de acceptatie van prijsbeleid hangt in belangrijke mate samen met de mate waarin het beleid bijdraagt aan de oplossing van de problemen van het autoverkeer.

Een tweede rechtvaardigheidsprincipe dat systematisch gerelateerd was aan de rechtvaardigheids- en acceptatieoordelen van de prijsmaatregelen was het ‘gelijkheidsprincipe’. Dit houdt in dat prijsbeleid rechtvaardiger en acceptabeler werd gevonden als iedereen evenredig door dit beleid getroffen wordt. Uit ander onderzoek blijkt ook dat het ‘gelijkheidsprincipe’ een belangrijk rechtvaardigheidsprincipe is. Echter, voor de rechtvaardigheid en acceptatie van prijsbeleid in verkeer en vervoer was het beschermen van de natuur, het milieu en toekomstige generaties een belangrijker rechtvaardigheidsprincipe dan het gelijkheidsprincipe.

De overige vier rechtvaardigheidsprincipes die we in dit onderzoek hebben meegenomen bleken belangrijk te zijn voor de rechtvaardigheids- en acceptatieoordelen van een aantal prijsmaatregelen, maar niet voor alle zes. Dit duidt erop dat deze vier rechtvaardigheidsprincipes een minder belangrijke rol spelen bij de oordelen over rechtvaardigheid en acceptatie van prijsbeleid in verkeer en vervoer dan de rechtvaardigheidsprincipes ‘bescherming natuur, milieu en toekomstige generaties’ en het ‘gelijkheidsprincipe’.

Wat zijn de belangrijkste conclusies van dit proefschrift?

Uit de resultaten van dit proefschrift blijkt dat de acceptatie van prijsbeleid in verkeer en vervoer op drie manieren kan worden verhoogd. Ten eerste door automobilisten te compenseren voor negatieve effecten van prijsbeleid. Ten tweede door de positieve effecten van prijsbeleid te benadrukken. Ten derde door rechtvaardig beleid in te voeren, wat met name gericht is op het beschermen van de natuur, het milieu en toekomstige generaties en op een gelijke behandeling van individuen.

De eerste strategie om de acceptatie van prijsbeleid in verkeer en vervoer te verhogen, het compenseren van automobilisten door bijvoorbeeld de wegenbelasting te verminderen, is erop

gericht om het eigen belang van automobilisten zo min mogelijk te schaden. Echter, het is zeer waarschijnlijk dat de effectiviteit van prijsbeleid afneemt als automobilisten worden gecompenseerd voor de prijsstijging, met als gevolg dat verkeersgerelateerde problemen waarschijnlijk minder of niet zullen afnemen. Dit proefschrift laat ook zien dat een afname van de problemen van het autoverkeer van groot belang is voor de acceptatie van prijsbeleid: effectief prijsbeleid is ook acceptabel prijsbeleid. Dat er nadelige gevolgen voor automobilisten zullen zijn als prijsbeleid wordt ingevoerd is evident. De resultaten van dit proefschrift laten echter zien echter dat als automobilisten ervan overtuigd zijn dat zij zelf en de maatschappij zullen profiteren van prijsbeleid in verkeer en vervoer doordat problemen worden opgelost, deze directe nadelige gevolgen minder zwaar zullen wegen in hun acceptatieoordelen.

Wat kan de praktijk met de resultaten van dit proefschrift?

Eén van de belangrijkste conclusies van dit proefschrift is dat de acceptatie van prijsbeleid in verkeer en vervoer toeneemt als mensen ervan overtuigd zijn dat dit beleid een bijdrage levert aan het verminderen van verkeersgerelateerde problemen. Hoe kan dit in de praktijk tot stand worden gebracht?

Automobilisten vinden het belangrijk dat zij zelf en de maatschappij profiteren van prijsbeleid doordat verkeersgerelateerde problemen verminderen. Daarom is het belangrijk dat in de communicatie met het publiek wordt benadrukt wat de potentiële voordelen van prijsbeleid zijn. Positieve effecten kunnen bijvoorbeeld worden benadrukt door aan te geven dat files verminderen, dat dit positieve economische gevolgen heeft, en dat dit waarschijnlijk leidt tot een kortere reistijd voor automobilisten. Het is ook belangrijk om te benadrukken dat prijsbeleid leidt tot een vermindering van de uitstoot van schadelijk stoffen omdat er minder auto zal worden gereden. In aanvulling hierop kan worden benadrukt dat de lokale luchtkwaliteit, bijvoorbeeld in binnensteden, zal toenemen, wat de gezondheid van individuen ten goede zal komen en in het algemeen tot een betere kwaliteit van leven zal leiden.

Vaak wordt door politici sterk de nadruk gelegd op de positieve effecten van prijsbeleid op het aantal en de lengte van files. Uit de resultaten van dit proefschrift blijkt dat mensen het ook heel belangrijk vinden dat milieuproblemen worden opgelost. Daarom is het belangrijk dat politici ook de milieuvoordelen van prijsbeleid in verkeer en vervoer benadrukken om de acceptatie van dit beleid te verhogen.

Het oplossen van verkeersgerelateerde problemen is vooral van belang in gebieden waar problemen daadwerkelijk worden ervaren. In deze gebieden zal prijsbeleid ook sneller acceptabel zijn, omdat mensen die in deze gebieden wonen zich meer bewust zijn van problemen. Daarom zou prijsbeleid vooral ingevoerd moeten worden in gebieden waar zich serieuze verkeersproblemen voordoen, omdat prijsbeleid hier effectiever en daarom waarschijnlijk ook acceptabeler zal zijn. Belangrijk is dat mensen ervan overtuigd zijn dat prijsbeleid daadwerkelijk een bijdrage levert aan het oplossen van verkeersgerelateerde problemen. Hiervoor kan het helpen om te refereren aan hoe prijsbeleid in het buitenland heeft bijgedragen aan de oplossing van de problemen van het autoverkeer, zoals bijvoorbeeld de congestieheffingen in London en Stockholm.

Tenslotte blijkt uit dit proefschrift dat de acceptatie voor een congestieheffing in Stockholm was toegenomen nadat mensen de voordelen van dit beleid hadden ervaren tijdens een proef. Na aanleiding van een referendum na de proef is de congestieheffing permanent ingevoerd in

Stockholm. Dit geeft aan dat het houden van proeven met prijsbeleid, mits ze effectief blijken te zijn, een goede strategie is om de acceptatie van prijsbeleid te verhogen.

References

Abrahamse, W., Steg, L., Gifford, R., & Vlek, C. (2009). Factors influencing car use for commuting and the intention to reduce it: A question of self-interest or morality? *Transportation Research Part F: Traffic Psychology and Behaviour, 12,* 317-324.

Abrahamse, W., Steg, L., Vlek, C., & Rothengatter, T. (2007). The effect of tailored information, goal setting, and tailored feedback on household energy use, energy-related behaviors, and behavioral antecedents. *Journal of Environmental Psychology, 27,* 265-276.

Adams, J. S. (1965). Inequity in social exchange. In L.Berkowitz (Ed.), *Advances in Experimental Social Psychology (10 ed.)* (pp. 267-299). New York: Academic Press.

Ahlstrand, I. (1998). The rise and fall of the heroic transport plan for Stockholm. *Transport Policy, 5,* 205-211.

Ahlstrand, I. (2001). The politics and economics of transport investment and pricing in Stockholm. *Journal of Transport Economics and Policy, 35,* 473-489.

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50,* 179-211.

Anderson, W., & Patterson, M. (2008). Effects of social value orientations on fairness judgments. *The Journal of Social Psychology, 148,* 223-245.

AVV-MON (Adviesdienst Verkeer en Vervoer - Mobiliteits Onderzoek Nederland) (2007). *Mobiliteitsonderzoek Nederland 2006: Tabellenboek.* Rotterdam, the Netherlands: Rijkswaterstaat, AVV.

Bamberg, S., & Rölle, D. (2003). Determinants of people's acceptability of pricing measures: Replication and extension of a causal model. In J. Schade & B. Schlag (Eds.), *Acceptability of transport pricing strategies* (pp. 235-248). Oxford: Elsevier Science.

Banister, D. (2008). The sustainable mobility paradigm. *Transport Policy, 15,* 73-80.

Bazerman, M. H., Loewenstein, G. F., & White, S. B. (1992). Reversals of preference in allocation decisions: Judging an alternative versus choosing among alternatives. *Administrative Science Quarterly, 37,* 220-240.

Bazerman, M. H., White, S. B., & Lowenstein, G. F. (1995). Perceptions of fairness in interpersonal and individual choice situations. *Current Directions in Psychological Science, 4,* 39-43.

Bethwaite, J., & Tompkinson, P. (1996). The ultimatum game and non-selfish utility functions. *Journal of Economic Psychology, 17,* 259-271.

Brehm, J. W. (1972). Responses of loss of freedom: A theory of psychological reactance. New York: General Learning Press.

Brookhuis, K. A., Cornelie, J. G., Hof, T., Van Arem, B., & Hoedemaeker, M. (2009). Driving with a congestion assistant; Mental workload and acceptance. *Applied Ergonomics, 40,* 1019-1025.

Bureau Goudappel Coffeng (1997). *Marktprofiel van een filerijder. Eindrapport* Deventer:

Bureau Goudappel Coffeng (in Dutch).
Button, K. (1993). *Transport economics*. Aldershot: Edward Elgar.
CBS (Centraal Bureau voor de Statistiek) statline (2009). *Personenauto's naar provincie*. Available at: www.statline.cbs.nl.
CfIT (Commission for Integrated Transport) (2001). *The CfIT report 2001: Public attitudes to transport in England.* Available at: http://www.cfit.gov.uk/reports/mori/index.htm.
CfIT (2006). World review of road pricing, phase 2, Final report. London, UK: CfIT.
Chapman, L. (2007). Transport and climate change: a review. *Journal of Transport Geography, 15,* 354-367.
Clayton, S. (2000). Models of justice in the environmental debate. *Journal of Social Issues, 56,* 459-474.
Commission for Transport (2004). *Attitudes to road pricing*. London, UK: CfIT.
Cvetkovich, G., & Earle, T. C. (1994). The construction of justice: A case study of public participation in land management. *Journal of Social Issues, 50,* 161-178.
Dawes, R. M. (1980). Social dilemmas. *Annual Review of Psychology, 31,* 169-193.
De Groot, J. I. M., & Steg, L. (2006). The role of value orientations in evaluating quality of life consequences of a transport pricing policy. *Transportation Research Part D: Transport and Environment, 11,* 160-165.
De Groot, J. I. M., & Steg, L. (2008). Value orientations to explain environmental attitudes and beliefs: How to measure egoistic, altruistic and biospheric value orientations. *Environment & Behavior, 40,* 330-354.
De Groot, J. I. M., & Steg, L. (2009a). Morality and prosocial behavior: The role of awareness, responsibility, and norms in the Norm Activation Model. *The Journal of Social Psychology, 149,* 425-449.
De Groot, J. I. M., & Steg, L. (2009b). Mean or green: Which values can promote stable pro-environmental behavior? *Conservation Letters, 2,* 61-66.
Deutsch, M. (1975). Equity, equality, and need: What determines which value will be used as the bases of distributive justice? *Journal of Social Issues, 31,* 137-149.
Deutsch, M. (1985). *Distributive justice*. New Haven, CT: Yale University Press.
Diekmann, K. A. (1997). 'Implicit justifications' and self-serving group allocations. *Journal of Organizational Behavior, 18,* 3-16.
Diekmann, K. A., Samuels, S. M., Ross, L., & Bazerman, M. H. (1997). Self-interest and fairness in problems of resource allocation: Allocators versus recipients. *Journal of Personality and Social Psychology, 72,* 1061-1074.
Dutch Ministry of Transport (2007). Making a start on a price per kilometre. Overview of preparatory research for the government decision on a price per kilometre. The Hague: Dutch Ministry of Transport.
Dutch Ministry of Transport (2009). *Voortgangsrapportage 2 anders betalen voor mobiliteit.* The Hague: Dutch Ministry of Transport (in Dutch).
Eagly, A. H., & Chaiken, S. (1993). *The psychology of attitudes*. Fort Worth, TX: Harcourt Brace Jovanovich.
Eagly, A. H., & Chaiken, S. (1998). Attitude structure and function. In D. T. Gilbert, S. T. Fiske, & G. Lindzey (Eds.), *The handbook of social psychology, Vols. 1 and 2 (4th ed.)* (pp. 269-322). New York, NY, US: McGraw-Hill.
Eagly, A. H., & Chaiken, S. (2007). The advantages of an inclusive definition of attitude.

Social Cognition, 25, 582-602.
ECMT (European Conference of Ministers of Transport) (2006). *Trends in the Transport Sector 1970-2004.* Brussels, Belgium: ECMT & OECD publications.
Eddington, R. (2006). The Eddington transport study: Transport's role in sustaining the UK's productivity and competitiveness. Norwich, UK: HMSO.
Eek, D., Biel, A., & Gärling, T. (1998). The effect of distributive justice on willingness to pay for municipality child care: An extension of the GEF hypothesis. *Social Justice Research, 11,* 121-142.
Eek, D., Biel, A., & Gärling, T. (2001). Cooperation in asymmetric social dilemmas when equality is perceived as unfair. *Journal of Applied Social Psychology, 31,* 649-666.
Eliasson, J., Hultkrantz, L., Nerhagen, L., & Rosqvist, L. S. (2009). The Stockholm congestion charging trial 2006: Overview of effects. *Transportation Research Part A: Policy and Practice, 43,* 240-250.
Eriksson, L., Garvill, J., & Nordlund, A. M. (2006). Acceptability of travel demand management measures: The importance of problem awareness, personal norm, freedom, and fairness. *Journal of Environmental Psychology, 26,* 15-26.
Eriksson, L., Garvill, J., & Nordlund, A. M. (2008). Acceptability of single and combined transport policy measures: The importance of environmental and policy specific beliefs. *Transportation Research Part A: Policy and Practice, 42,* 1117-1128.
EU (European Union) (2003). Europe at a crossroads: The need for sustainable transport. Brussels: EU.
Fujii, S., Gärling, T., Jakobsson, J., & Jou, R. C. (2004). A cross-country study of fairness and infringement on freedom as determinants of car owners' acceptance of road pricing. *Transportation, 31,* 285-295.
Gärling, T., Fujii, S., Gärling, A., & Jakobsson, C. (2003). Moderating effects of social value orientation on determinants of proenvironmental behavior intention. *Journal of Environmental Psychology, 23,* 1-9.
Gärling, T., Jakobsson, C., Loukopoulos, P., & Fujii, S. (2008). Public acceptability of road pricing. In E. T. Verhoef, M. C. J. Bliemer, L. Steg, & B. Van Wee (Eds.), *Pricing in road transport: A multi-disciplinary perspective* (pp. 193-208). Cheltenham, UK and Northampton, MA, USA: Edward Elgar.
Gärling, T., & Schuitema, G. (2007). Travel demand management targeting reduced private car use: Effectiveness, public acceptability and political feasibility. *Journal of Social Issues, 63,* 139-153.
Garvill, J. (1999). Choice of transportation mode: Factors influencing drivers' willingness to reduce personal car use and support car regulations. In M. Foddy, M. Smithson, S. Schneider, & M. Hogg (Eds.), *Resolving Social Dilemmas* (pp. 263-279). Philedelphia: Psychology Press.
Gaunt, M., Rye, T., & Allen, S. (2007). Public acceptability of road user charging: The case of Edinburgh and the 2005 referendum. *Transport Reviews, 27,* 85-102.
Gawronski, B., & Bodenhausen, G. V. (2006). Associative and propositional processes in evaluation: An integrative review of implicit and explicit attitude change. *Psychological Bulletin, 132,* 692-731.
Gehlert, T., & Nielsen, O. A. (2007). *Triangulation of data sources for analysing car drivers' responses to road pricing in Copenhagen*. Paper presented at the European Transport

Conference, 17-19 October, Noordwijkerhout, The Netherlands.
Geller, E. S. (1989). Applied behavior analysis and social marketing: An integration for environmental preservation. *Journal of Social Issues, 45,* 17-36.
Groot, A. T. J. (2001). Het Nederlandse fijn stof beleid en de effecten van verkeersmaatreglen. De omgang van overheden met fijn stof problematiek, de bijdrage van verkeer en het beleid dat overheden voeren. Petten, The Netherlands: Energie Centrum Nederland (in Dutch).
Gudmundsson, H., Ericsson, E., Hugosson, M. B., & Rosqvist, L. S. (2009). Framing the role of decision support in the case of Stockholm congestion charging trial. *Transportation Research Part A: Policy and Practice, 43,* 258-268.
Handgraaf, M. J. J., Van Dijk, E., Wilke, H. A. M., & Vermunt, R. C. (2004). Evaluability of outcomes in ultimatum bargaining. *Organizational Behavior and Human Decision Processes, 95,* 97-106.
Harland, P., Staats, H., & Wilke, H. A. M. (1999). Explaining proenvironmental intention and behavior by personal norms and the theory of planned behavior. *Journal of Applied Social Psychology, 29,* 2505-2528.
Hegtvedt, K. A., & Cook, K. S. (2001). Distributive justice: Recent theoretical developments and applications. In J. Sanders, V. L. Hamilton, J. Sanders, & V. L. Hamilton (Eds.), *Handbook of justice research in law* (pp. 93-132). Dordrecht, The Netherlands: Kluwer Academic Publishers.
Hendrickx, L., & Nicolaij, S. (2004). Temporal discounting and environmental risks: The role of ethical and loss-related concerns. *Journal of Environmental Psychology, 24,* 409-422.
Isaksson, K., & Richardson, T. (2009). Building legitimacy for risky policies: The cost of avoiding conflict in Stockholm. *Transportation Research Part A: Policy and Practice, 43,* 251-257.
Ison, S. (2000). Local authority and academic attitudes to urban road pricing: A UK perspective. *Transport Policy, 7,* 269-277.
Jaensirisak, S., Wardman, M., & May, A. D. (2005). Explaining variations in public acceptability of road pricing schemes. *Journal of Transport Economics and Policy, 39,* 127-153.
Jakobsson, C., Fujii, S., & Gärling, T. (2000). Determinants of private car users' acceptance of road pricing. *Transport Policy, 7,* 153-158.
Johansson, B. (2009). Will restrictions on CO2 emissions require reductions in transport demand? *Energy Policy, 37,* 3212-3220.
Joireman, J. A., Lasane, T. P., Bennett, J., Richards, D., & Solaimani, S. (2001). Integrating social value orientation and the consideration of future consequences within the extended norm activation model of proenvironmental behaviour. *British Journal of Social Psychology, 40,* 133-155.
Joireman, J. A., Van Lange, P. A. M., & Van Vugt, M. (2004). Who cares about the environmental impact of cars? Those with an eye toward the future. *Environment and Behavior, 36,* 187-206.
Jones, P. M. (1991a). Gaining public support for road pricing through a package approach. *Traffic Engineering and Control, 32,* 194-196.
Jones, P. M. (1991b). UK public attitudes to urban traffic problems and possible countermeasures: A poll of polls. *Environment and Planning C: Government and Policy,*

9, 245-256.
Jones, P. (2003). Acceptability of transport pricing strategies: Meeting the challenge. In J. Schade & B. Schlag (Eds.), *Acceptability of transport pricing strategies* (pp. 27-62). Oxford: Elsevier Science.
Kahneman, D., Knetsch, J. L., & Thaler, R. (1986a). Fairness as a constraint on profit seeking: entitlements in the market. *The American Economic Review, 76,* 728-741.
Kahneman, D., Knetsch, J. L., & Thaler, R. H. (1986b). Fairness and the assumptions of economics. *The Journal of Business, 59,* 285-300.
Kahneman, D. (1992). Reference points, anchors, norms, and mixed feelings. *Organizational Behavior and Human Decision Processes, 51,* 296-312.
Kitamura, R., Fujii, S., & Pas, E. (1997). Time-use data, analysis and modelling: Toward the next generation of transportation planning methodologies. *Transport Policy, 4,* 225-235.
Kottenhoff, K., & Brundell-Freij, K. (2009). The role of public transport for feasibility and acceptability of congestion charging: The case of Stockholm. *Transportation Research Part A: Policy and Practice, 43,* 297-305.
Larsen, O. I. (1995). The toll cordons in Norway: An overview. *Journal of Transport Geography, 3,* 187-197.
Lerner, M. J. (2003). The justice motive: Where social psychologists found it, how they lost it, and why they may not find it again. *Personality and Social Psychology Review, 7,* 388-399.
Lindenberg, S., & Steg, L. (2007). Normative, gain and hedonic goal frames guiding environmental behavior. *Journal of Social Issues, 63,* 117-137.
Loewenstein, G. F., Thompson, L., & Bazerman, M. H. (1989). Social utility and decision making in interpersonal contexts. *Journal of Personality and Social Psychology, 57,* 426-441.
Menon, A. (2000). ERP in Singapore: A perspective one year on. *Traffic Engineering and Control, 41,* 40-45.
Merland, S. (1995). Generalised and advanced urban debiting innovations. The GAUDI project 3. The Trondheidm toll ring. *Traffic Engineering and Control, 36,* 150-155.
Messick, D. M. (1993). Equality as a decision heuristic. In: B.A. Mellers, B. A. and J. Baron (Eds.), *Psychological perspectives on justice (pp 11-31).* New York: Cambridge University Press.
Messick, D., & Schell, T. (1992). Evidence for an equality heuristic in social decision making. *Acta Psychologica, 80,* 311-323.
Messick, D. M., & McClintock, C. G. (1968). Motivational basis of choice in experimental games. *Journal of Experimental Social Psychology, 4,* 1-25.
Messick, D. M., & Sentis, K. P. (1979). Fairness and preference. *Journal of Experimental Social Psychology, 15,* 418-434.
Miljöavgiftkansliet (2006). *Fakta och resultat från Stockholmsförsöket. Second edition. Stockholms Stad.* Available at: http://www.stockholmsforsoket.se/upload/Rapporter/Fakta%20och%20resultat%20stockholmsf%C3%B6rs%C3%B6ket%20aug%2006.pdf (in Swedish).
Moore, D., & Loewenstein, G. (2004). Self-interest, automatcity, and the psychology of conflict of interest. *Social Justice Research, 17,* 189-202.
Nationaal Platform Anders Betalen voor Mobiliteit (2005). *Anders betalen voor mobiliteit* The

Hague, The Netherlands: Nationaal Platform Anders Betalen voor Mobiliteit (in Dutch).
Nolan, J. M., Schultz, P. W., Cialdini, R. B., Goldstein, N. J., & Griskevicius, V. (2008). Normative social influence is underdetected. *Personality and Social Psychology Bulletin, 34,* 913-923.
Nordlund, A. M., & Garvill, J. (2003). Effects of values, problem awareness, and personal norm on willingness to reduce personal car use. *Journal of Environmental Psychology, 23,* 339-347.
Odeck, J., & Bråthen, S. (1997). Public attitudes towards toll roads. *Transport Policy, 4,* 73-83.
Odeck, J., & Bråthen, S. (2002). Toll financing in Norway: The success, failures and perspective for the future. *Transport Policy, 9,* 253-260.
OECD (Organisation for Economic Co-operation and Development) (1997). *Towards sustainable transportation*. Paris: OECD Publications.
OECD (2001). *Environmental outlook*. Paris: OECD Publications.
OECD (2008). *OECD Environmental Outlook to 2030.* Paris: OECD publications.
Poortinga, W., Steg, L., Vlek, C., & Wiersma, G. (2003). Household preferences for energy-saving measures: A conjoint analysis. *Journal of Economic Psychology, 24,* 49-64.
Ramjerdi, F., Minken, H., & Østmoe, K. (2004). Norwegian urban tolls. In G. Santos (Ed.), *Road pricing: theory and evidence* (pp. 237-249). Oxford, UK: Elsevier Ltd.
Raux, C., & Souche, S. (2004). The acceptability of urban road pricing: A theoretical analysis applied to the experience in Lyon. *Journal of Transport Economics and Policy, 38,* 191-216.
Rawls, J. (1999). *A theory of justice (2nd ed.).* Cambridge, MA: Belknap Press of Harvard University Press.
Rienstra, S. A., Rietveld, P., & Verhoef, E. T. (1999). The social support for policy measures in passenger transport. A statistical analysis for the Netherlands. *Transportation Research D, 4,* 181-200.
Santos, G. (2004b). Urban road pricing in the U.K. In G. Santos (Ed.), *Road pricing: theory and evidence* (pp. 209-235). Oxford, UK: Elsevier Ltd.
Santos, G. (2004a). *Road pricing: Theory and evidence*. Oxford: Elsevier Ltd.
Santos, G., Li, W. W., & Koh, T. H. (2004). Transport policies in Singapore. In G. Santos (Ed.), *Road pricing: theory and evidence* (pp. 251-282). Oxford, UK: Elsevier Ltd.
Schade, J., & Schlag, B. (2000). *Acceptability of urban transport pricing*. Helsinki: VATT.
Schade, J., & Schlag, B. (2003). Acceptability of urban transport pricing strategies. *Transportation Research Part F: Traffic Psychology and Behaviour, 6,* 45-61.
Schlag, B., & Schade, J. (2000). Public acceptability of traffic management in Europe. *Traffic Engineering and Control, 41,* 314-318.
Schlag, B., & Teubel, U. (1997). Public acceptability of transport pricing. *IATSS Research, 21,* 134-142.
Schuitema, G., Steg, L., & Vlek, C. A. J. (2007). Are pricing policies effective in changing car use? *IATSS Research, 31,* 21-31.
Schuitema, G., Ubbels, B., Steg, L., & Verhoef, E. (2008). Car user's acceptability of a kilometre charge. In E. Verhoef, M. C. J. Bliemer, L. Steg, & B. Van Wee (Eds.), *Road pricing in transport: A multi-disciplinary perspective* (pp. 209-226). Cheltenham, UK and Northampton, MA, USA: Edward Elgar.

Schultz, P. W., Gouveia, V. V., Cameron, L. D., Tankha, G., Schmuck, P., & Franek, M. (2005). Values and their relationship to environmental concern and conservation behavior. *Journal of Cross-Cultural Psychology, 36,* 457-475.

Schwartz, S. H. (1977). Normative influences on altruism. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 10). New York: Academic Press.

Schwarz, N. (2007). Attitude construction: Evaluation in context. *Social Cognition, 25,* 638-656.

Small, K. A. (1992). Using the revenues from congestion pricing. *Transportation, 19,* 359-381.

Small, K. A., & Gomez-Ibañez, J. A. (1998). Road pricing for congestion management: the transition from theory to policy. In K. J. Button & E. T. Verhoef (Eds.), *Road pricing, traffic congestion and the environment. Issues of efficiency and social feasibility* (pp. 213-246). Cheltenham, UK: Edward Elgar.

Steg, E. M. (1996). Gedragsverandering ter vermindering van het autogebruik: theoretische analyse en empirische studie over probleembesef, verminderingsbereidheid en beoordeling van beleidsmaatregelen. Groningen: Rijksuniversiteit Groningen: Faculteit der Psychologische, Sociologische en Pedagogische Wetenschappen (dissertation)

Steg, L. (2003). Factors influencing the acceptability and effectiveness of transport pricing. In J. Schade & B. Schlag (Eds.), *Acceptability of transport pricing strategies* (27 ed., pp. 187-202). Oxford: Elsevier Science.

Steg, L. (2005). Car use: Lust and must. Instrumental, symbolic and affective motives for car use. *Transportation Research Part A: Policy and Practice, 39,* 147-162.

Steg, L., Dreijerink, L., & Abrahamse, W. (2005). Factors influencing the acceptability of energy policies: A test of VBN theory. *Journal of Environmental Psychology, 25,* 415-425.

Steg, L., Dreijerink, L., & Abrahamse, W. (2006). Why are energy policies acceptable and effective? *Environment and Behavior, 38,* 92-111.

Steg, L., & Schuitema, G. (2007). Behavioural responses to transport pricing: A theoretical analysis. In T. Gärling & L. Steg (Eds.), *Threats to the quality of urban life from car traffic: Problems, causes, and solutions* (pp. 347-366). Amsterdam: Elsevier.

Steg, L., Tillema, T., Van Wee, B., & Schuitema, G. (2008). Firm's perception and acceptance of transport pricing. In E. Verhoef, M. C. J. Bliemer, L. Steg, & B. Van Wee (Eds.), *Road pricing in transport: A multi-disciplinary perspective* (pp. 250-269). Cheltenham, UK and Northampton, MA, USA: Edward Elgar.

Steg, E. M., & Vlek, C. (1997). The role of problem awareness in willingness-to-change car use and in evaluating relevant policy measures. In J. A. Rothengatter & E. Carbonell Vaya (Eds.), *Traffic & transport psychology: Theory and application* (pp. 465-476). UK: Elsevier Science Ltd.

Stern, P. C. (2000). Toward a coherent theory of environmentally significant behavior. *Journal of Social Issues, 56,* 407-424.

Stern, P. C., & Dietz, T. (1994). The value basis of environmental concern. *Journal of Social Issues, 50,* 65-84.

Stockholmförsöket (2005). *Information leaflet*. Available at: www.stockholmsforsoket.se.

Stockholmförsöket (2006). Facts and results from the Stockholm trials: Final version, December 2006. Stockholm, Sweden: Stockholmförsöket.

Stradling, S. G., Meadows, M. L., & Beatty, S. (1999). *Factors affecting car use choices.* Napier University, Edinburgh, UK: Transport Research Institute.
Tesser, A. (1978). Self-generated attitude change. In B. Leonard (Ed.), *Advances in Experimental Social Psychology* (Volume 11 ed., pp. 289-338). New York: Academic Press.
TfL (Transport for London) (2004). *Impacts monitoring: Second annual report.* London, UK: TfL.
TfL (2006). Impacts Monitoring: Fourth Annual Report. London, UK: TfL
TfL (2007). Impacts Monitoring: Fifth Annual Report. London, UK: TfL
Thøgersen, J. (1996). Recycling and morality: A critical review of the literature. *Environment & Behavior, 28,* 536-558.
Thorpe, N. (2002). Public acceptance of road-user charging. A case-study of the toll-rings in Norway. *IATSS Research, 26,* 17-27.
Tretvik, T. (2003). Urban road pricing in Norway: Public acceptability and travel behaviour. In J. Schade & B. Schlag (Eds.), *Acceptability of transport pricing strategies* (pp. 77-92). Oxford, UK: Elsevier Science.
Tyler, T. R. (2000). Social justice: Outcome and procedure. *International journal of Psychology, 35,* 117-125.
Ubbels, B. (2006). Road pricing: Effectiveness, acceptance and institutional aspects. Amsterdam: Free University (dissertation).
Ubbels, B., & Verhoef, E. (2007). The economics of transport pricing. In T. Gärling & L. Steg (Eds.), *Threats to the quality of life from car traffic: problems, causes, and solutions* (pp. 325-345). Amsterdam: Elsevier.
UNEP (United Nations Environment Programme) (1999). GEO 2000: Global environmental outlook 2000. London, UK: Earthscan.
UNEP (2001). Transport and the global environment: Accounting for GHG reductions in policy analysis. Paris, France: United Nations Environmental Programme.
Vägverket (2006). Trail implementation of a congestion tax in Stockholm 3 January - 31 July 2006. Available at: www.stockholmsforsoket.se.
Van Vugt, M., Meertens, R. M., & Van Lange, P. A. M. (1995). Car versus public transportation? The role of social value orientations in a real-life social dilemma. *Journal of Applied Social Psychology, 25,* 258-278.
Van Vugt, M., Van Lange, P. A. M., & Meertens, R. M. (1996). Commuting by car or public transportation? A social dilemma analysis of travel mode judgments. *European Journal of Social Psychology, 26,* 373-395.
Van Wee, B. (2007). Environmental effects of urban traffic. In T. Gärling & L. Steg (Eds.), *Threats to the quality of urban life from car traffic: Problems, causes, and solutions* (pp. 11-32). Amsterdam: Elsevier.
Verhoef, E. T. (1996). Economic efficiency and social feasibility in the regulation of road transport externalities. Amsterdam: Thesis Publishers Amsterdam (dissertation).
Verhoef, E. (2008). Road transport pricing: Motivation, objectives and design from an economic perspective. In E. T. Verhoef, M. C. J. Bliemer, L. Steg, & B. Van Wee (Eds.), *Pricing in road transport: A multi-disciplinary perspective* (pp. 6-26). Cheltenham, UK and Northampton, MA, USA: Edward Elgar.
Vlek, C. (2007). Societal management of sustainable transportation: International policy

review and socio-behavioural recommendations. In T. Gärling & L. Steg (Eds.), *Threats to the quality of urban life from car traffic: Problems, causes, and solutions* (pp. 425-449). Amsterdam: Elsevier.

Wade-Benzoni, K. A. (2002). A golden rule over time: Reciprocity in intergenerational allocation decisions. *The Academy of Management Journal, 45,* 1011-1028.

Wade-Benzoni, K. A., Hernandez, M., Medvec, V., & Messick, D. (2008). In fairness to future generations: The role of egocentrism, uncertainty, power, and stewardship in judgments of intergenerational allocations. *Journal of Experimental Social Psychology, 44,* 233-245.

Wade-Benzoni, K. A., & Tost, L. P. (2009). The egoism and altruism of intergenerational behavior. *Personality and Social Psychology Review, 13,* 165-193.

Walster, E., Berscheid, E., & Walster, G. W. (1973). New directions in equity research. *Journal of Personality and Social Psychology, 25,* 151-176.

WBCSD (World Business Council for Sustainable Development) (2004). *Mobility 2030: Meeting the challenges to sustainability*. Geneva, Switzerland: WBSCD Sustainable Mobility Project.

Wilke, H. A. M. (1991). Greed, efficiency and fairness in resource management situations. *European Review of Social Psychology, 2,* 165-187.

Winslott-Hiselius, L., Brundell-Freij, K., Vagland, A., & Byström, C. (2009). The development of public attitudes towards the Stockholm congestion trial. *Transportation Research Part A: Policy and Practice, 43,* 269-282.

Wolsink, M. (2007). Wind power implementation: The nature of public attitudes: Equity and fairness instead of 'backyard motives'. *Renewable and Sustainable Energy Reviews, 11,* 1188-1207.

Worldwatch Institute (2006). *State of the world: Our urban future 2007.* Washington: Worldwatch Institute.

Yamagishi, T. (1986). The structural goal/expectation theory of cooperation in social dilemmas. In E. J. Lawler (Ed.), *Advances in group processes, Vol. 3* (pp. 51-87). Greenwich, CT: JAI Press.

Zlatev, M., Pahl, S., & White, M. (2010). Perceived risk and benefit for self and others as predictors of smokers' attitudes towards smoking restrictions. *Psychology & Health, 25,* 167-182.

The “Kurt Lewin Institute Dissertation Series” started in 1997. Since 2008 the following dissertations have been published:

2008-1: Marijke van Putten: Dealing with missed opportunities. The causes and boundary conditions of inaction inertia
2008-2: Marjolein Maas: Experiential Social Justice Judgment Processes
2008-3: Lonneke de Meijer: Ethnicity effects in police officer selection: Applicant, assessor, and selection-method factors
2008-4: Frederike Zwenk: Voice by Representation
2008-5: Margreet Reitsma: The Impact of Linguistically Biased Messages on Involved Receivers
2008-6: Marcus Maringer: Feeling one thing, seeing another: Emotion comparison effects in person judgments
2008-7: Hanneke Heinsman: The competency concept revealed: Its nature, relevance, and practice
2008-8: Joris Lammers: Toward a more social social psychology of power
2008-9: Daniël Fockenberg: Between Good and Evil: Affective Priming in Dynamic Context
2008-10: Arne van den Bos: Why we stereotype influences how we stereotype: self-enhancement and comprehension effects on social perception
2008-11: Lidewij Niezink: Considering Others in Need: On Altruism, Empathy and Perspective Taking
2008-12: Aad Oosterhof: Better together: Antecedents and consequences of perceived expertise dissimilarity and perceived expertise complementarity in teams
2008-13: Femke ten Velden: Negotiation in dyads and groups: The effects of social and epistemic motives
2008-14: Maike Wehrens: How did YOU do? Social comparison in secondary education
2008-15: Kyra Luijters: Making Diversity Bloom: Coping Effectively with Cultural Differences at Work
2008-16: Ilona de Hooge: Moral emotions in decision making: Towards a better understanding of shame and guilt
2008-17: Lindred L. Greer: Team Composition and Conflict: The Role of Individual Differences
2008-18: Sezgin Cihangir: The Dark Side of Subtle Discrimination: How targets respond to different forms of discrimination
2008-19: Giel Dik: On the contagiousness of others’ goals: The role of perceiving effort
2008-20: Lotte van Dillen: Dealing with negative feelings: The role of working memory in emotion regulation
2008-21: Marijn Poortvliet: Information exchange examined: An interpersonal account of achievement goals
2008-22: Sjoerd Pennekamp: Dynamics of disadvantage: Uncovering the role of group-based anger
2008-23: Chris Reinders Folmer: Cooperation and communication: Plastic goals and social roles
2009-1: Marijke Leliveld: Ethics in Economic Decision-Making
2009-2: Monique Pollmann: Accuracy and Bias in Person Perception
2009-3: Krispijn Faddegon: Regulatory Focus in Group Contexts
2009-4: Lieven Brebels: Mirror, mirror on the wall… Procedural fairness as an evaluative and regulatory looking-glass self
2009-5: Daphne Wiersema: Taking it personally: Self-esteem and the protection of self-related attitudes
2009-6: Judith D.M. Grob: Dial E for Emotion: Context and Consequences of Emotion Regulation
2009-7: Katherine Stroebe: Is this about me? Responding to subtle discrimination - beyond an individual versus group perspective
2009-8: Menno Vos: Identity patterns in diverse work groups: Improving social integration outcomes through relational identities
2009-9: Lennart Renkema: Facing Death Together: Understanding The Consequences of Mortality Threats
2009-10: Michael Vliek: Group-based social comparison processes: An intragroup level of analysis
2009-11: Karlijn Massar: Unconscious rivals: The automatic evaluation of rivals in jealousy-evoking situations
2009-12: Bart Terwel: Origins and consequences of public trust: Towards an understanding of public acceptance of carbon dioxide capture and storage
2009-13: Emma ter Mors: Dealing with information about complex issues: The role of source perceptions
2009-14: Martijn Veltkamp: On the Instigation of Implicit Motivation: How Deprivation and Positive Affect

Cause Motivated Behavior

2009-15: Marret K. Noordewier: Consistency and the unexpected

2009-16: Sytske van der Velde: Imitation of Emotion: How meaning affects the link between imitation and liking

2009-17: Jacomijn Hofstra: Attaching Cultures: The role of attachment styles in explaining majority members' acculturation attitudes

2009-18: Jacqueline Tanghe: Affect in Groups: Convergence, Conditions and Consequences

2009-19: Anne Marijke Lokhorst: Using Commitment to Improve Environmental Quality

2009-20: Jonathan van 't Riet: Framing Health Communication Messages

2009-21: Suzanne Pietersma: Persuasive Health Communication: A Self-Perspective

2009-22: Remco Wijn: A functional perspective on the justice judgment process and its consequences

2009-23: Niels van de Ven: The bright side of a deadly sin: The psychology of envy

2009-24: Anthon Klapwijk: The Power of Interpersonal Generosity

2010-1: Maarten Wubben: Social Functions of Emotions in Social Dilemmas

2010-2: Joyce Rupert: Diversity faultlines and team learning

2010-3: Daniel Lakens: Abstract Concepts in Grounded Cognition

2010-4: Luuk Albers: Double You? Function and Form of Implicit and Explicit Self-Esteem

2010-5: Matthijs Baas: The Psychology of Creativity: Moods, Minds, and Motives

2010-6: Elanor Kamans: When the Weak Hit back: Studies on the Role of Power in Intergroup Conflict

2010-7: Skyler Hawk: Changing Channels: Flexibility in Empathic Emotion Processes

2010-8: Nailah Ayub: National Diversity and Conflict: The Role of Social Attitudes and Beliefs

2010-9: Job van der Schalk: Echoing Emotions: Reactions to Emotional Displays in Intergroup Context

2010-10: Nevra Cem: *Organizational citizenship behavior and counterproductive work behavior: Cross-cultural comparisons between Turkey and the Netherlands*

2010-11: Ron Broeders: On Situated and Embodied Knowledge Regarding Moral Issues

2010-12: Margriet Braun: Dealing with a deviant group member

2010-13: Dennis Bleeker: Representing or defecting? The pursuit of individual upward mobility in low status groups

2010-14: Petra Hopman: *Group Members Reflecting on Intergroup Relations*

2010-15: Janneke Oostrom: *New Technology in Personnel Selection: The Validity and Acceptability of Multimedia Tests*

2010-16: Annefloor Klep: *The Sharing of Affect: Pathways, Processes, and Performance*

2010-17: Geertje Schuitema: *Priceless policies. Factors influencing the acceptability of transport pricing policies*

Stellingen

behorende bij het proefschrift
'Priceless policies. The acceptability of transport pricing policies'
Geertje Schuitema

1. De acceptatie van prijsbeleid in verkeer en vervoer is vooral laag omdat automobilisten niet verwachten dat verkeersproblemen worden opgelost, en niet zozeer omdat ze hun autogebruik niet willen aanpassen.

2. Automobilisten dragen meer bij aan onveilige verkeerssituaties dan fietsers.

3. De acceptatie van prijsmaatregelen neemt toe als mensen ervaren dat ze zelf voordeel van dit beleid ondervinden.

4. Mensen streven niet *altijd* hun eigen belang na.

5. Beprijzingsproeven kunnen een effectieve manier zijn om de acceptatie van beleid te verhogen.

6. Eigenwijsheid is een deugd.

7. Rechtvaardig en acceptabel beleid houdt vooral in dat natuur, milieu en toekomstige generaties worden beschermd.

8. Het dragen van een fietshelm verhoogt slechts de illusie van veiligheid.

9. Het oormerken van prijsbeleid door de opbrengsten terug te geven aan de automobilist doet de acceptatie van prijsbeleid alleen toenemen op de korte termijn.

10. Intrinsieke motivatie is een belangrijke voorwaarde om aan een proefschrift te beginnen; relativeringsvermogen is essentieel om een proefschrift succesvol af te ronden.

11. Veel en hard lachen verhoogt de werkproductiviteit.

Propositions

part of the dissertation
'Priceless policies. The acceptability of transport pricing policies'
Geertje Schuitema

1. The acceptability of transport pricing policies is particularly low, mainly because car users do not expect car-related problems to be solved, and not so much because they do not want to change their car use.

2. Car users contribute to unsafe traffic situations more than cyclists.

3. The acceptability of transport pricing policies increases when people experience personal benefits from these policies.

4. People do not *always* serve their self-interest.

5. Transport pricing trials can be effective to enhance the acceptability of transport pricing policies.

6. Stubbornness is a virtue.

7. Fair and acceptable policies especially protect nature, the environment and future generations.

8. Wearing a cycling helmet only increases the illusion of safety.

9. Earmarking the revenues from charging car users by allocating them to benefit car users will increase the acceptability of transport pricing policies in the short term only.

10. Intrinsic motivation is an important precondition to start a PhD; being able to put things in perspective is essential to finish a PhD successfully.

11. Frequent and loud laughter increases work productivity.