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Behaviour Theory and Soft Transport Policy Measures

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Abstract

The aim is to propose a theoretical grounding of soft transport policy measures to reduce car use. A general conceptual framework is first presented to clarify how hard and soft transport policy measures impact on car-use reduction. Two different behavioural theories that have been used to account for car use and car-use reduction are then integrated in a self-regulation theory that identifies three stages of the process of voluntarily changing car use, setting a car-use reduction goal, forming a plan for achieving the goal, and initiating and executing the plan. A number of techniques are described that facilitate the different stages of the process of car-use reduction.

Keywords: Soft transport policy measures, travel behaviour, behavioural theory, intervention techniques

1. Introduction

Private car use is in several respects a future threat to the human environment (Gärling & Steg, 2007). This has led to the development and implementation of transport policy measures aiming at reducing or changing car use (e.g. Kitamura & Fujii, 1998; Kitamura et al., 1997). The measures are divided into "hard" and "soft." Hard measures include, for instance, improvements of infrastructure for and management of public transport services, increased costs for car use, and prohibition or rationing of car use. These measures may not alone be effective in achieving car-use reduction (Stopher, 2004), and some are difficult to implement because of public opposition or political infeasibility (Gärling & Schuitema, 2007; Jones, 2003). Interest has therefore increased in soft measures which use techniques of information dissemination and persuasion to influence car users to voluntarily switch to sustainable travel modes (Gärling & Fujii, 2009; Jones & Sloman, 2006; Rose & Ampt, 2003; Taniguchi et al., 2007; Taylor, 2007; Taylor & Ampt, 2003). Soft transport policy measures are also referred to as voluntary-change measures (Loukopoulos, 2007), psychological and behavioural strategies (Fujii & Taniguchi, 2006) or mobility management tools (Cairns et al., 2008). Frequently implemented measures include workplace travel plans (encouraging work commuters to not use the car), school travel plans (encouraging parents to not drive their children to school), personalised travel planning (encouraging reduced car use for all trip purposes), marketing of public transport (mass advertising campaigns), and travel awareness campaigns (increasing awareness of problems resulting from car use) (Cairns et al., 2008).

In the following soft transport policy measures are confined to various forms of *personalised travel planning*. Available empirical evidence for their effectiveness is first briefly summarized. A lack of theoretical grounding of the measures has been noted (Chatterjee & Bonsall, 2009; Richter et al., 2010b). The main aim of the present paper is to show that behavioural theories provide such a theoretical grounding. A general conceptual framework is first presented to clarify the impact of hard and soft transport policy measures on car users' switching to sustainable travel modes. It is followed by presentation of two behavioural theories which identify psychological determinants of car use as well as car-use reduction. These theories are then integrated in a self-regulation theory providing the theoretical underpinning of techniques that are components of soft transport policy measures. The paper concludes with a discussion of future research needs.

2. Evidence for the effectiveness of soft transport policy measures

Several narrative reviews (Brög et al., 2009; Cairns et al., 2008; Richter et al., 2010a; Taylor, 2007) have concluded that a majority of evaluation studies substantiate that soft transport policy measures are effective. Here we want to highlight that this is likewise the conclusion based on two meta-analyses. Meta-analysis is a technique that provides quantitative estimates of effects (see e.g. Lipsey & Wilson, 2001). Bamberg and Möser (2007b) demonstrated that other conclusions may be drawn based on the results of meta-analyses than narrative reviews.

In one of the meta-analysis Möser and Bamberg (2008) synthesised the results of 141 studies evaluating the car-use reduction effects of workplace travel plans (44 studies), school travel plans (25 studies), and travel awareness campaigns/marketing of public transport (72 studies). Across all 141 studies a significant standardised mean effect size of 0.15 (Cohen's *h*) was found, corresponding to a 11% decrease of the proportion of trips conducted by car (from 61% to 54%). However, all studies used a quasi-experimental treatment group pre-post test design. This design fails to

control for several factors that reduce the internal validity of causal inferences (Fujii et al., 2009; Stopher et al., 2009). Furthermore, external validity or generalisability of the results is threatened by the fact that most of the synthesised evaluation results were based on non-representative samples.

In the second meta-analysis Fujii et al. (2009) used data from evaluation studies of 15 Japanese ”travel feedback programs”. The methodological quality of these studies is higher because they used a pre-post-test comparison or control group design which increases internal validity. A standardised mean effect size of 0.17 (Cohen’s *d*) was calculated. This corresponds to a decrease in the average number of weekly car trips from 6.9 to 5.7. However, the external validity is limited. The total number of studies was small and most of them were based on small non-representative samples. Furthermore, at least some of the studies seem to have used non-equivalent treatment and comparison groups, thus making it difficult to rule out alternative explanations for the reported post-test differences.

To summarise, the currently available evaluation results provide empirical evidence for that soft transport policies are effective in influencing car users to reduce car use. However, because of the noted methodological problems (Fujii et al., 2009; Stopher et al., 2009), the question still remains somewhat open of how much of the observed car-use reduction can be causally attributed to the impact of the techniques that are components of soft transport policy measures. Furthermore, in their narrative review, Richter et al. (2010a, 2010b) identified many gaps of knowledge and needs for additional research. One recognized research priority is longitudinal panel studies (but see Fujii and Gärling, 2003, and Matsumura, 2008, who have documented sustainable changes up to 4 years) that examine the time course of changes in travel. Further research is also needed to clarify what factors account for the existence (or nonexistence) of long-term effects. Additional research should illuminate how the simultaneous implementation of hard transport policy measures would increase the effectiveness of soft transport policy measures and *vice versa*. Of most relevance to the present paper, Richter et al. (2010b) concluded that there exists knowledge gaps and needs for research concerning why soft transport policy measures are effective. Such research should be guided by theories, focussing on the evaluation of techniques such as goal setting, plan formation, and customizing of information. Both the cost-effectiveness of single techniques and, more importantly, their combinations need to be assessed.

3. A theoretical grounding of soft transport policy measures

In the last decades the need for theory-driven interventions has been recognized (Bartholomew et al., 2006). When there are no explicit theoretical links between interventions and their intended effects, one cannot ascertain why the interventions did or did not work. An evaluation is therefore of less value for improving the intervention. Likewise, when success or failures cannot be attributed to the techniques employed, it is difficult to transfer evaluation results to other implementations, in other locations or targeting other populations.

In implementations of soft transport policy measures, one finds very little explicit statements about a theoretical rationale (Gärling & Fujii, 2009). Frequently reference is made to social marketing (Jones & Sloman, 2006). As Thøgersen (2007) note, social marketing is however a tool for assisting the systematic development and implementation of an intervention. Thus, proponents of soft transport policy measures cannot reasonably claim that the techniques they use for changing car use are based on empirically supported theories.

In the following we will show that theories developed in psychological research have the potential to provide a theoretical grounding of soft transport policy measures. After first presenting a general conceptual framework, two psychological theories which frequently have been used to account for car use or changes in car use are briefly described. We then present a joint theory that combines elements of these theories and, finally, we extend this joint theory in a way such that it would work as a theoretical grounding of soft transport policy measures.

3.1 A general conceptual framework

We start with presenting a general conceptual framework relating decision making, discussed later in more detail, to the objective environment and socio-demographic factors which frequently are evoked to account for disaggregate travel behaviour (e.g. Hanson, 1995). In the conceptual framework (see Figure 1) perception of features of the objective environment (e.g. available travel modes, spatial distribution and quality of shopping and leisure facilities) provides the knowledge base from which people derive their personal set of possible travel options. It is assumed that these options consist of trip chains (see Axhausen & Gärling, 1992; Gärling et al., 2002) defined as bundles of attributes (i.e. purposes, departure and arrival times, travel times, monetary costs). Besides the objective environment, socio-demographic factors (i.e. family structure, income, employment) and situational factors (i.e. family logistics, time pressure, weather, time of day, weekday) influence perception of possible travel options.

Figure 1

Hard transport policy measures modify the objective environment. It may lead to changes in travel if car users perceive how the environment is modified (e.g. blocked freeway lanes), deliberately reflect on the consequences it may have for the possible set of travel options (e.g. resulting in increased travel time by car), and judge that these consequences provide sufficient reasons to change current car travel (e.g. public transport provides a faster service). In contrast, the aim of soft transport policy measures is to directly influence decision making by altering car users' perceptions of the objective environment, by altering their judgements of the consequences associated with the use of different travel options, and by motivating and empowering them to switch to alternative travel options.

It should be noted that the conceptual framework stresses the interdependence of hard and soft transport policy measures. With the implementation of hard transport policy measures that change the relative attractiveness of travel options, the possibility increases that soft transport policy measures would be effective in motivating and empowering car users to switch to the these options.

3.2 Behavioural theories of car use and car-use reduction

In this section theories and some research results are presented with the aim of providing a more detailed picture of the individual decision making that is a component of the general conceptual framework. In the last decade most psychological research targeting determinants of car use or changes in car use has primarily been guided by two theories (Anable et al., 2006): The Theory of Planned Behaviour (TPB) (Ajzen, 1991) and the norm-activation theory (Schwartz, 1977) which are briefly described in the following.

Theory of Planned Behaviour (TPB). The theory of reasoned action (TRA) was developed in the 1970s (Ajzen & Fishbein, 1977; Fishbein & Ajzen, 1974) and was early adopted by transport researchers (Gärling et al., 1998; Golob et al., 1979; Koppelman & Lyon, 1981). Yet, it never fully replaced discrete choice models (McFadden, 2001). TRA or its successor the theory of planned behaviour (TPB) (Ajzen, 1991) is not a theory of discrete choice but of how an intention to perform behaviour is formed. It is referred to as an expectancy-value theory (Fishbein & Ajzen, 1975) since it is based on the assumption that an attitude[1] towards the behaviour is formed by summing the products of the subjective probabilities of the occurrence of and the positive vs. negative evaluations of all salient expected consequences of the behaviour. This assumption is similar to expected utility theories (Starmer, 2004) that have been proposed to account for choices. According to TPB, if alternative behaviours exist, a choice is made among them based on the relative strengths of the intentions to perform the behaviours. An important difference to discrete choice models (see Ben-Akiva et al., 1999) is that the intentions are also determined by other factors than the attitudes towards the behaviours. The TPB stresses the importance of situational constraints. For example, when forming an intention to use car or bus, people do not only take into account their attitudes toward these two travel modes but they also judge the difficulty of using them. This is referred to as perceived behavioural control (PBC). Social norm is a third factor influencing behavioural intention. In TPB social norm is conceptualised as perceived social pressure, that is expectations of the degree to which significant reference persons will approve performance of the behaviour (e.g. the use of a specific travel mode).

Norm-Activation Theory. Originally the norm-activation theory (Schwartz, 1977) aimed at explaining pro-social behaviours. It has later been developed into value-belief-norm theory (Stern, 2000) to specifically account for pro-environmental values, attitudes and behaviour. The norm-activation theory may fare better than TPB in explaining car-use reduction. Whereas car use predominantly depends on evaluations of positive and negative consequences for the car user (Garvill, 1999), car-use reduction appears to depend more strongly on pro-social motives. This is consistent with findings that personal norm is an important determinant of car-use reduction (e.g. Nordlund & Garvill, 2003). A personal norm is defined as the felt obligation to bring own behaviour in line with personally important internalised self-standards (e.g. Biel & Thøgersen, 2007). The formation and activation of personal norms results from an interplay of cognitive, emotional and social factors. Problem awareness and perceived responsibility are cognitive preconditions for its development (Schwartz, 1977).

The perception that one is responsible for a behaviour causing harm to other people frequently triggers feelings of guilt (e.g. Weiner, 1995), which is a pro-social emotion in that it results in a felt obligation to compensate for the caused damage (Baumeister, 1998). Besides feelings of guilt, social norms also contribute to the development of personal norms. Social norms inform people about what behavioural standards their social reference group views as appropriate in a particular context. Personal and social norms coincide when people have internalised such social expectations.

A joint theory. The existence of two empirically supported but contrasting theories for explaining car use and car-use reduction is unsatisfying. Bamberg et al. (2007) and Bamberg and Möser (2007a) therefore proposed to augment TPB by adding

personal norm from norm-activation theory as another determinant of intention. Furthermore, in the joint theory social norm has a different role than in TPB. In line with research on informational social influence (e.g. Moscovici, 1985), it is assumed that people follow social norms less because they expect social sanctions, as assumed in TPB, but because social norms inform them about what behaviour is normal. Thus, social norms do not only provide information whether a behaviour is morally right or wrong but also whether it is performed by a majority of others.

Figure 2

Bamberg et al. (2007) conducted two studies in which they successfully applied the joint theory to explain choices of public transport services for daily travel. Furthermore, Bamberg and Möser (2007a) tested the model with meta-analytically synthesised information from 46 studies published since 1995 in peer-reviewed journals. These studies reported correlations between the constructs posited in the joint theory and measures of different pro-environmental behaviours obtained from 57 independent samples. The correlation matrices were input to a meta-analytical structural equation model (MASEM, see Becker, 2000; Viswesvaran & Ones, 1995). Whereas meta-analysis synthesise quantitative research findings (in this case correlation coefficients) across different studies and contexts, structural equation modelling (SEM) assesses the degree to which a theory-based model (based on the joint theory) fits the empirical pattern of the pooled correlations. Figure 2 shows standardised path coefficients and explained variances. As can be seen, the results support the hypothesis that behavioural intention mediates the effects on behaviour of the other constructs. Intention explains on average 27% of the variance in behaviour. The hypothesis is also supported that PBC, attitude and personal norm have independent effects on intention. Together they explain on average 52% of the variance in intention. As hypothesised, feelings of guilt, social norm, responsibility and problem awareness all have significant effects on personal norm. Together these four variables explain on average 58% of the variance in personal norm. The results also showed that, besides its direct as well as indirect (through feelings of guilt) effects on personal norm, social norm has a direct effect on PBC and attitude. There is furthermore a direct path from feelings of guilt to attitude. The results finally support the hypothesized role of problem awareness since it has a direct effect on responsibility, feelings of guilt, social norm and personal norm.

Table 1

Gardner and Abraham (2008) reported the results of a meta-analysis synthesising the results of 23 studies of psychological determinants of actual car-use reduction. The right part of Table 1 presents the pooled correlations between car-use reduction and the constructs of the joint theory. As can be seen, the pooled correlations reported for car use are similar to those reported by Bamberg and Möser (2007a) (left part of the table) for different pro-environmental behaviours. Thus, it is suggested that the joint theory may be generalized to account for car-use reduction.

A self-regulation theory of travel change. For the development of soft transport policy measures, a theory is needed of the process of car users' voluntarily changes of their current car use. To this end Bamberg (2010) proposed a self-regulation theory that integrates elements of TPB, the norm-activation theory and the joint

theory. Self-regulation refers to that the theory applies concepts from control theory (Carver & Scheier, 1998; Gärling et al., 2002; Loukopoulos et al., 2007).

The self-regulation theory implies transitions through different stages as displayed in Figure 3.The end of the first stage is marked by the setting of a car-use reduction goal and behavioural intention to achieve the set goal (note that also other goals may be set, such as cutting expenses, increasing public transport use). Setting of such a goal may reflect the felt obligation (personal norm) to bring current travel more in line with important self-relevant standards, activated by feelings of guilt due to the perception that current travel has negative collective consequences in conjunction with perceived own responsibility for these negative consequences. Social norms are viewed as another possible determinant of the felt obligation to reduce car use. Setting of the goal of car-use reduction also depends on perceived goal feasibility, that is perception of possible alternative travel options. Since a car-use reduction goal is not specific enough to directly guide a change in travel, a behavioural plan or intention (e.g. using the bus or the bike instead of the car) needs to be formed to reach the goal. Formation of a behavioural intention or plan to choose another travel option as the means of achieving the car-use reduction goal marks the end of the second stage. Initiation and feedback-controlled execution of the new travel option marks the end of the third stage.

Figure 3

Bamberg (2010) reported a correlational test of the self-regulation theory. A sample of 1,358 adults was asked which of several statements expressed their personal car-use reduction goal for the next month. The statement “My goal is to decrease my car use” was chosen by 20% of the sample, “I would like to decrease my car use, but I am unable to do so at the present time” by 18%, “My goal is to stay at the same level of car use” by 22%, “My goal is to increase my car use” by 2%, and “I have no goal to change my car use” by 39%. Figure 4 shows that, as theoretically expected, a strong association is observed between awareness of the negative collective consequences of current car use and the perceived responsibility to contribute to the reduction of these negative consequences (*ß* = 0.79; R^2 = 0.63). Feelings of guilt mediate the relationship between perceived responsibility and personal norm. Perceived responsibility affects feelings of guilt (*ß* = 0.70; R^2 = 0.49) which in turn affect personal norm (*ß* = .21). The results also provide weak evidence for that perceived responsibility affects social norm (expectations of approval be important reference persons) (*ß* = 0.23; R^2 = 0.05). Furthermore, social norm affect personal (*ß* = 0.57). Together with feelings of guilt (ß = 0.21), social norm explains 41% of the variance in personal norm. As hypothesized, personal norm is directly (*ß* = .18) as well as indirectly associated with the intention to achieve the car-use reduction goal through its significant association with goal feasibility (*ß* = .26), emotions anticipated from goal progress (*ß* = .34) and failure (ß = .15). Besides, goal intention is associated with goal feasibility (*ß* = .59) and emotions anticipated from goal progress (*ß* = .37). Together, personal norm, goal feasibility and emotions anticipated from goal progress explain 65% of the variance in goal intention.

Confronted with the question which behavioural strategy they would use to achieve their car-use reduction goal, participants choose most frequently the two options ”Using public transport more frequently for everyday trips ” (29 %) and ”Walk more frequently for everyday trips shorter than 3 km” (26 %). The selection of the specific behavioural intention or plan for reaching the intended car-use reduction goal is affected by goal intention (*ß* = .51) and behavioural control (*ß*

= .63), and to a smaller degree by personal norm (ß = .12) and attitude (ß = .10). Together, these variables explain 68% of the variance in behavioural intention. The results also show that behavioural planning is significantly associated with behavioural intention (ß = .52) and perceived behavioural control (ß = .18). Together the variables explain 44% of the variance in behavioural planning.

Figure 4

4. Theory-based techniques

Based on the self-regulation theory, more cost-effective soft transport policy measures may be developed. Particularly important is the conceptualization of voluntary car-use reduction as a transition through different stages, forming a goal intention to reduce car use, forming a behavioural intention to do this, and choosing the alternative travel option that reduces car use.

Currently, one single measure is usually used for all car users (Richter et al., 2010a). If car-use reduction is a transition through different stages, more flexibility would be needed, allowing matching the measure employed to the stage of the car user. If targeting car users in an early stage, the measure would likely be more effective if targeting problem awareness and perceived responsibility. Making social norms salient would also be important in this stage. For car users who already have formed a car-use reduction intention, providing information about the availability as well as evaluations of different alternative travel options would be more effective. Persons who already have formed an intention to use a specific alternative travel option would benefit most from support of its implementation.

The self-regulation theory also provides a ”blueprint” for theory-based techniques as components of soft transport policy measures. Table 2 summarizes how the process stages posited by the theory may be connected to specific techniques that are likely to enhance the outcome of the stage. A variety of techniques exist that aim at making social norms salient, for instance mass media role-modelling (e.g., McAlister, 1995, see also Goldstein & Cialdini, 2007; Schulz, 1998). Scenario-based risk information (e.g. Hendrickx et al., 1989) and consciousness raising (e.g. Prochaska et al., 2002) are examples of techniques that increases problem awareness and responsibility. Locke and Latham (2002) have demonstrated that stimulating the setting of feasible but challenging goals leads to better performance than does setting easy goals. However, the positive effect of difficult goals depends on that people accept the challenge and have sufficient experience, possess self-efficacy and obtain adequate feedback (e.g. McCalley & Midden, 2002). There are also a number of techniques that aim at increasing the perceived behavioural control as well as positive attitudes towards alternative options (e.g. Ajzen & Manstead, 2007). Linking members to new networks by mentor programs, buddy systems, and self-help groups (e.g. Heaney & Israel, 2002) are examples. Examples of techniques that would facilitate goal achievement include planning or practicing when, where, and how to initiate a new behaviour (e.g. Gärling & Fujii, 2002; Gollwitzer, 1999; Gollwitzer & Sheeran, 2006) as well as training of coping skills like identifying risk situations, practicing solutions, and coping with lapses (e.g. Marlatt & Gordon, 1985). Immediate customized feedback is important for maintaining the new behaviour (e.g. Carver & Scheier, 1998).

Table 2

5. Future research directions

Two types of future lines of research are particularly needed for the further development of cost-effective soft transport policy measures. One line of research should concentrate on the theory-based development and experimental tests of techniques. The focus of this research should be based on the insights of behavioural science research addressed in this paper to improve the theory of the causal mechanisms underlying car use as well as its voluntary change. If supported by solid empirical evidence, in a second step the identified causal mechanisms should be systematically connected with techniques potentially able to activate these mechanisms. In a third step a series of small-scale experiments should be conducted to test whether the newly developed techniques are indeed able to activate the causal mechanisms and whether their activation results in behavioural change (for an example of such a research program, see Taniguchi & Fujii, 2006; Taniguchi et al., 2007). A critical feature of such experiments is the random assignment of participants to experimental and control groups (Fujii et al., 2009). Because the focus of this research is on causality, high internal validity is essential whereas external validity - the generalisability of the results - is less important. For this reason studies aiming at testing the causal effects of new theory-based techniques may use convenience samples. Ideally, as was illustrated in Table 2, this type of research would result in sets of empirically supported causal mechanisms and techniques that activate these mechanisms.

A second type of research should concentrate on the development of large-scale evaluations of prototypes of soft transport policy measures under field conditions. In practice most transport policy measures consist of packages of different empirically-supported techniques. However, the development of such packages should also be based on theory-driven assumptions about the causal role of each element included in the package. Besides the evaluation of the procedures used for producing and delivering the intervention to the target group (process evaluations), the aim of such large-scale intervention studies is the valid estimation of the behavioural effects of these measure under field conditions (outcome evaluations). For this purpose both high internal and external validity is essential. Thus, to guarantee a high internal validity of the evaluation results, true experimental research designs should be used. Fuji et al. (2009) provide an overview of how to apply such research designs within the context of evaluations of soft transport policy measures. To guarantee high external validity of the results, large-scale evaluations are required based on data from representative population-based samples. As soon as a body of adequate high-quality evaluation studies is available, meta-analytic techniques (e.g. Lipsey & Wilson, 2001) should be used to calculate reliable and precise estimates of the effects. Furthermore, if the synthesis of the available evaluation results indicate a strong variability of the reported effects, meta-analyses provide statistical tools for analysing the potential sources of this variability, that is the possible impact of different population characteristics, differences in techniques, or differences in location. A precondition for this is that the evaluation reports contain enough detailed information about these factors.

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Footnote

[1]Attitude is similar to preference but refers in general to a more enduring disposition of choosing a behaviour.

Table 1

Pooled correlations (r) between hypothesized determinants and pro-environmental behaviours and car-use reduction, respectively.

	Pro-environmental behaviours				Car-use reduction			
Determinant	**n**	**k**	**R**	**95% CI**	**n**	**k**	**r**	**95% CI**
Problem awareness	8,276	18	.22	[.11, .27]	799	3	-.24	[-.33, -.15]
Perceived responsibility	1,866	6	.25	[.13, .34]	---	---	---	---
Social norm	7,325	18	.31	[.21, .41]	993	2	.36	[.36, .36]
Feelings of guilt	3,203	5	.31	[.21, .38]	---	---	---	---
Perceived behavioural control	8,029	18	.30	[.18, .40]	324	2	.31	[-.05, .65]
Attitude	6,751	17	.54	[.26, .56]	569	4	.27	[-.15, .70]
Personal norm	6,840	11	.58	[.12, .61]	563	2	-.41	[-.70, -.11]
Behavioural intention	5,654	15	.52	[.42, .61]	2,517	4	.53	[.35, .72]

Note. k = number of pooled studies; n = pooled sample size; CI = confidence interval.

Table 2. Examples of theory-based techniques.

Process stage	**Target of technique**	**Technique**
Goal intention	Social norm Personal norm Problem awareness Perceived responsibility	Mass media role-modelling Scenario-based risk information Consciousness raising
Behavioural intention	Information about alternatives Planning	Providing customized information Social support Training of coping skills
Behaviour	Negative feedback	Providing immediate customized feedback

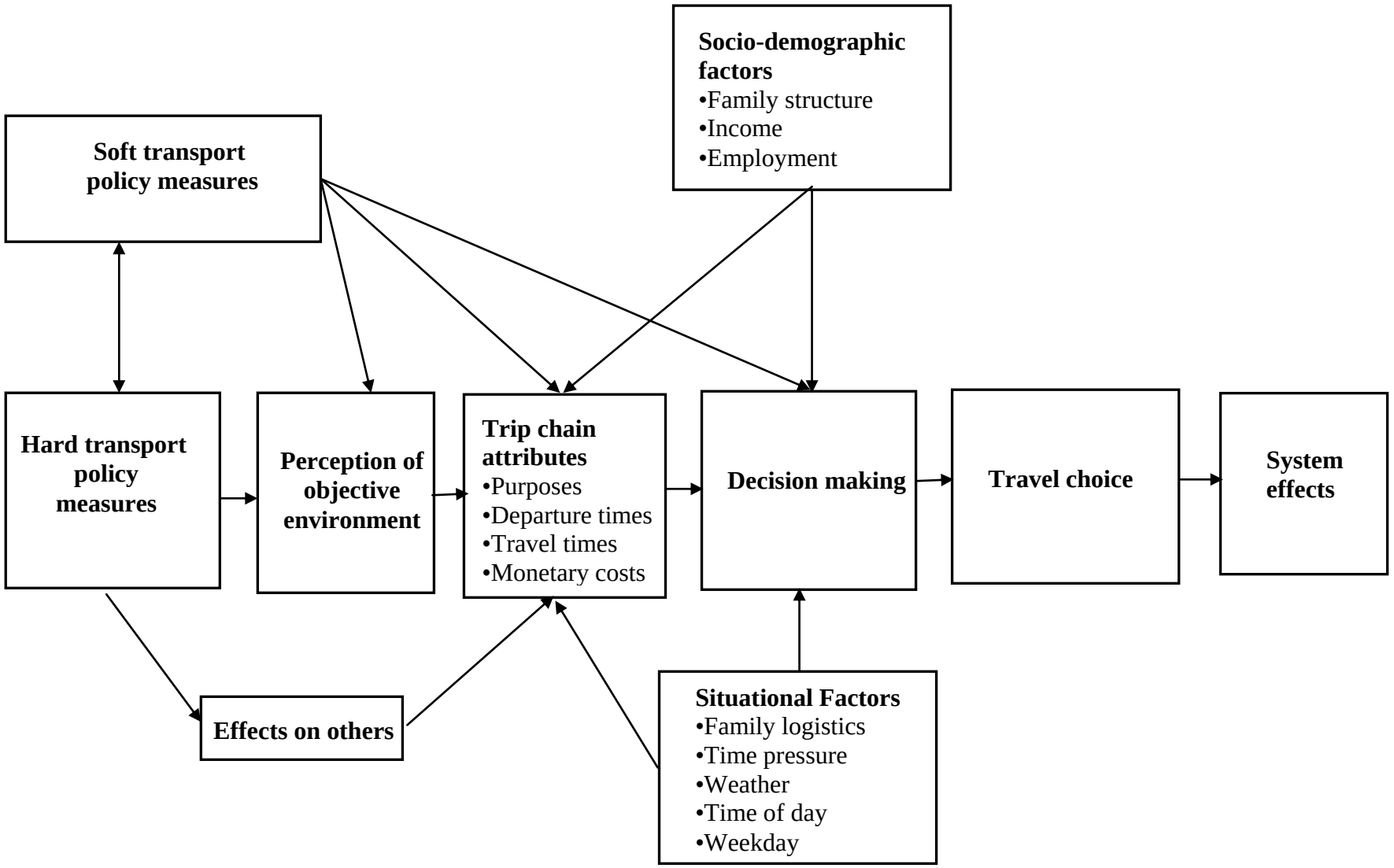
Figure captions

Fig. 1. A general conceptual framework

Fig. 2. Results of path analysis of meta-analytically pooled correlations. (Single-headed arrows represent causal paths, double-headed arrows represent correlations; standardized path coefficients and explained variance are shown). (Adapted from Bamberg and Mösel, 2007.)

Fig. 3.. The self-regulation theory's hypothesized stages of the process of behavioural change and their determinants.

Fig. 4. An estimated structural model based on the self-regulation theory of voluntary change of car use. (Standardised path coefficients and explained variances are shown).



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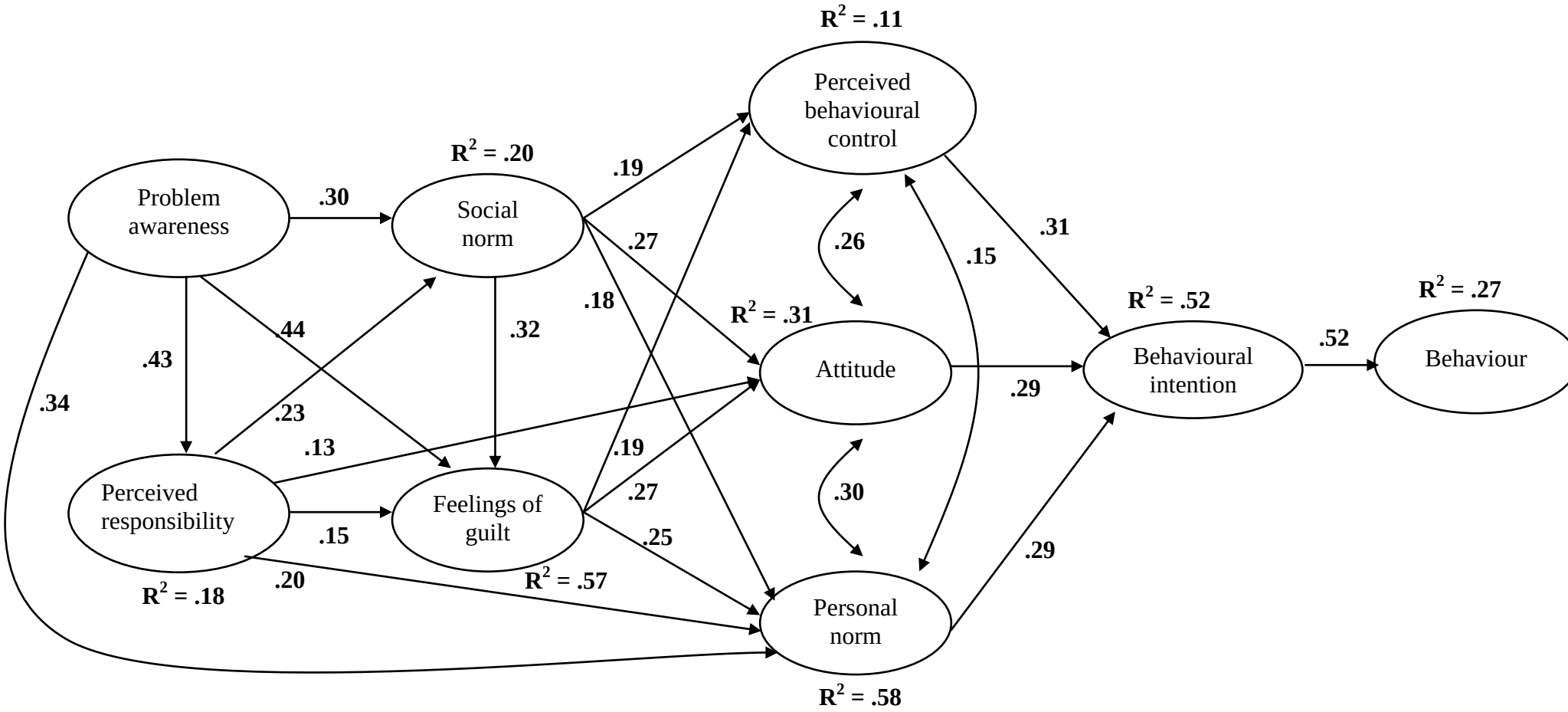

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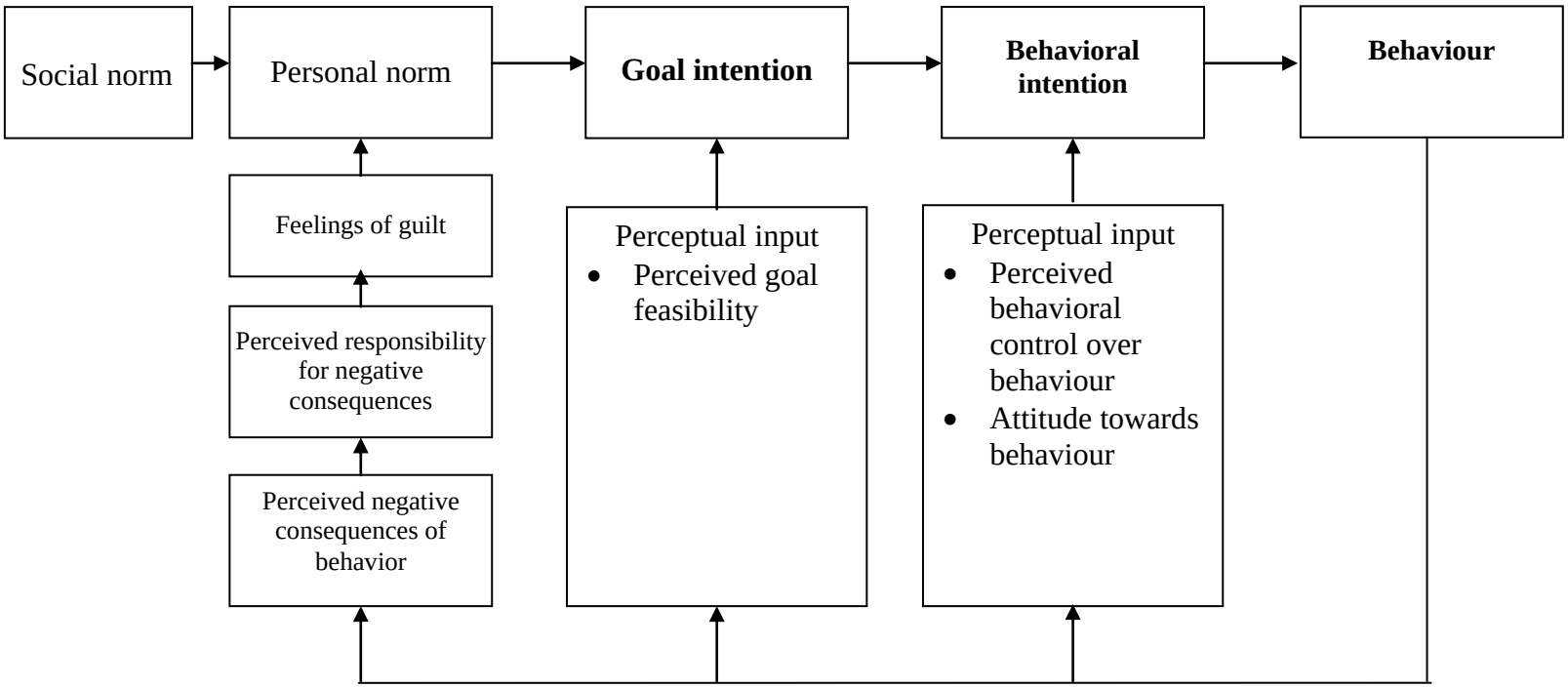

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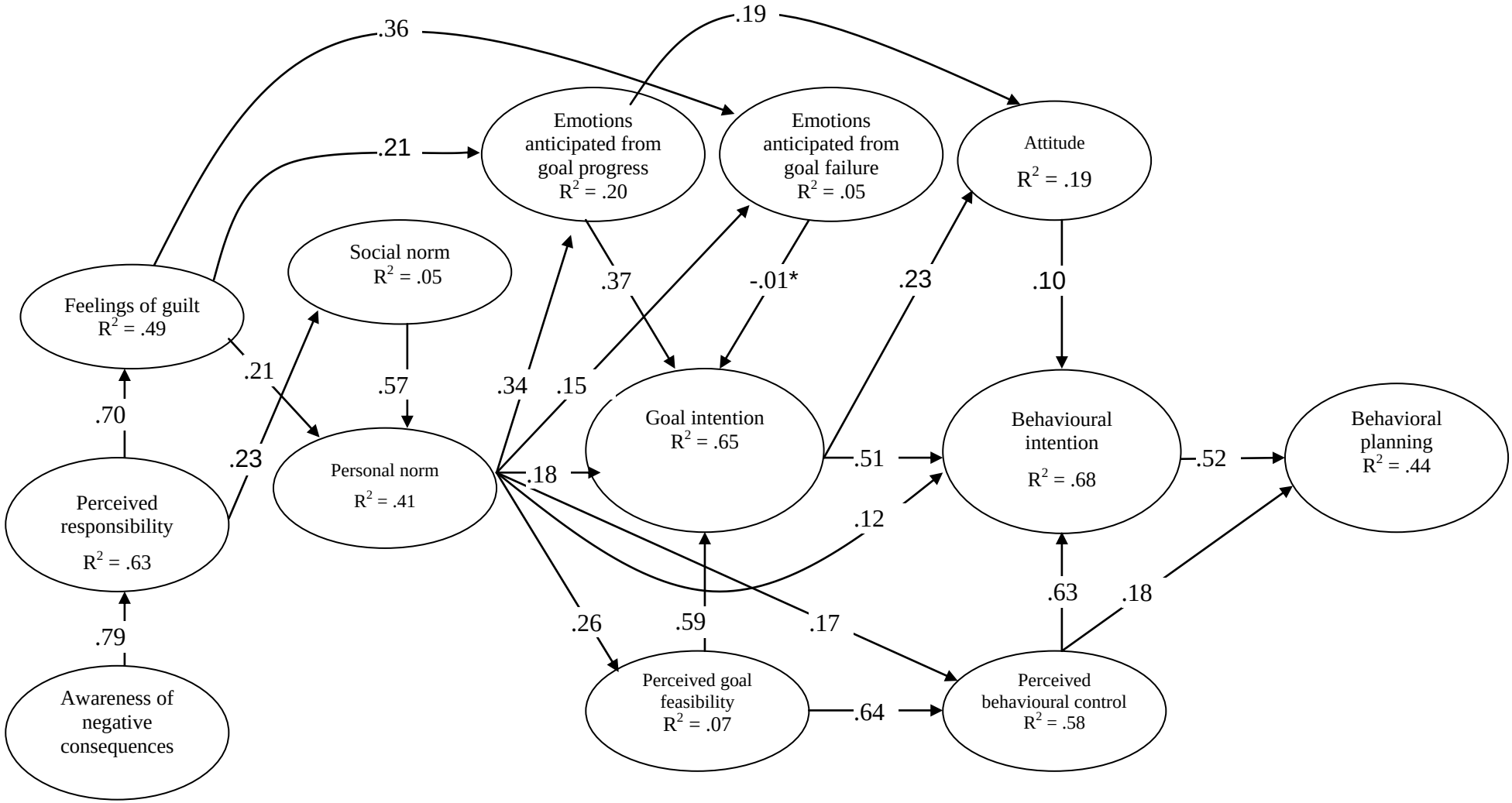

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