As roads become increasingly congested with traffic, parking becomes an increasingly bigger problem for many cities. In order to limit the number of drivers who park in city centres, local governing bodies have implemented various measures with which to influence traffic behaviour. Although, many and diverse mechanisms are currently employed these are insufficient to curb excessive city traffic. Consequently, there is an ongoing search for insight into why people drive and park in busy areas despite the inconveniences. In the present study, we examine this issue from a social psychological perspective.

If we better understand how people make parking decisions, we are better able to provide parking facilities that meet drivers’ needs and wants on one hand and the needs of the city in terms of mobility management, safety, accessibility and liveability on the other. Parking tariffs are often considered to play a key role in determining drivers’ parking behaviour and are therefore often deemed to be an effective way of influencing this behaviour. Recent studies in the Netherlands, however, have shown that tariffs are not necessarily the most important factor in parking decisions (ANWB, 2003; Snijder, 2000). Thus, in order to understand how people make parking decisions, we must examine a whole range of factors, of which price is just one. To do this we have undertaken a study, in which we identify factors that contribute to parking decisions, with particular attention paid to parking tariffs. In addition to tariffs, we examine other characteristics of parking systems that increase or decrease their desirability (e.g., the room for manoeuvring a car in a parking garage or the perceived safety of a parking facility).

In our approach, we consider parking behaviour to be determined by attitudes and behavioural intentions, consistent with the Theory of Reasoned Action (Fishbein & Ajzen, 1975) and the later version of this theory, the Theory of Planned Behavior (Ajzen, 1991). The basic premise in these theories is that an individual can have an attitude regarding a particular object (a thing, person, or group, but also an event, standpoint or idea).
lead to the formation of a behavioural intention consistent with the attitude, which in turn drives behavior. In both theory and practice, however, attitudes alone appear insufficient to either describe or predict intentions and, subsequently, behaviour. In addition, research has demonstrated that the habitual aspects of behaviour are key in influencing traffic behaviour (Aarts, Verplanken & Van Knippenberg, 1997; Verplanken & Aarts, 1999). The present study extends this theoretical approach by including the role of habit and situational factors. This is illustrated in Figure 1.

In this model, we describe four factors that either directly or indirectly determine Behaviour: Attitude, Intention, Situation and Habit. We define behaviour as the choice of parking in a particular location. Generally speaking, there are two types of behaviour: reasoned behaviour and automatic behaviour. Reasoned behaviour is behaviour that has been well thought-out before it is performed and in our model is determined by intention. In turn, intention is determined by two factors:

1. **Attitude.** This refers to a driver's attitude towards a particular parking system, such as parking garages, or a particular parking garage. Also included are attitudes towards characteristics of a parking system (e.g. safety, location).
2. **Situation.** This refers to situational factors that may influence a parking choice. We differentiate between two types of situational factors: environmental characteristics (weather, traffic volume) and trip characteristics (destination, number and type of passengers).

Alternatively, behaviour can be automatic in nature. That is, neither conscious nor intentional, and needs little attention in its execution. **Habit** is one type of automatic behaviour. Characteristic of habits (as with most automatic behaviour) is that they are performed without being preceded by a conscious thought process and, thus, directly influence (parking) behaviour.
The present study is the first of two with which we will put the above model to the test. In the present study, we use a web-based questionnaire to evaluate parking intentions, their determinants, and habit with regards to preferences for parking garages, parking lots, street-side parking, and park & ride. These factors are shown in Figure 1 in grey. In the second study, to be conducted later this year, we re-examine intentions and habits as determinants of behaviour by linking them to actual parking behaviour. In this study, the entire model shown in Figure 1 is put to the test.

The study

In order to better understand how people make reasoned parking decisions, we must consider that these decisions are based on the weight given to various characteristics. Essential is that the different characteristics do not always carry the same weight in all parking decisions. Based on our model, we identify three types of characteristics: characteristics of parking systems, environmental characteristics and trip characteristics. In the present study, the various characteristics are operationalized as follows:

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1 At the time this paper was written, data collection was not yet complete. As a result, the present paper addresses only the conceptual background for the study, the design and data collection methods we employed and hypothesised results. Actual results are described in the oral presentation given at the ECOMM 2004 conference in Lyon, France. A detailed description of the results is available from the authors upon request.
• Characteristics of parking systems: means of payment, tariff structure, price, location, anticipated parking space availability, room for manoeuvring, business hours, objective safety, subjective safety, and proximity of parking location to destination.
• Environmental characteristics: weather, availability of alternatives, and familiarity with the area.
• Trip characteristics: travel goal, number and type of passengers, time of trip, and parking duration.

When weighing the different characteristics, travel goal is likely to be one of the main factors taken into account. To illustrate, consider that when travelling for business, punctuality is important and, as someone else is picking up the tab, price does not play a role. As a result, the place you park your car may be astronomically expensive, but as long as it’s close to your destination you are likely to park there. When travelling for personal reasons such as an afternoon of shopping, being close to your destination may not be as important because you plan to walk quite a long distance anyway. Furthermore, as you are paying yourself, price may be a concern in making a parking choice. In order to take these differences into consideration in the present study, where possible we asked respondents to rate the importance of the various characteristics separately for five different travel goals: business, shopping, errands, daytime recreation, and evening/night-time recreation.

Above, we describe the factors examined in the present study with respect to reasoned parking decisions. In addition, the present study examines parking decisions as habitual behaviours. We take into account three factors that make up habits: the degree to which the decision is thought out, familiarity with the parking location, self-reported habit, and convenience.
To participate, respondents must be in possession of a driver’s licence and have regular experience with paid parking locations. Participants respond to questions addressing the following:

- General attitude regarding the indicated parking systems,
- Payment before or after parking, means of payment and tariff structure,
- The importance of the identified characteristics in making a parking decision,
- Habit,
- Travel goals and how they relate to the identified characteristics,
- Demographic variables.

Based on previous research (ANWB, 2003; Snijder, 2000), we expect that the most important factors in making a parking choice will be the proximity of the parking location to the destination, objective and subjective safety of the parking area, price, and room for manoeuvrability. The present study will extend such results by providing insight into the way that various factors interact with one another, and how changes to one factor affect the weight of the others. Our main hypothesis is that these interactions support the model described earlier. In addition, we expect the importance of the various factors to vary depending upon the travel goal:

- For business travel, proximity to destination will be particularly important and price will essentially play no role;
- For shopping and daytime recreation, proximity will not be as important as for business travel and night-time recreation;
- For night-time recreation, objective and subjective safety will be the most important considerations by far;
- Room for manoeuvrability will be an important consideration regardless of travel goal; and
- For none of the travel goals will price be the most important factor.
Discussion

In the present study we examine factors that influence the *intention* to park in a particular place, be it a particular parking garage or on a particular street. We do not explicitly address actual *parking behaviour*. Indeed many studies stop at intentions and do not consider the link between intentions and actual behaviour. In order to address the strength of this link, we will be conducting a study later in 2004 that examines behaviour specifically. The goal of this second study is to assess the ability to predict parking behaviour, given various parameters as they are defined in the present study (e.g., weather, safety concerns).

Inherent in both studies is the assumption that the choice for one parking location or another is a reasoned decision. We believe that this is indeed the case in many instances. In particular, when parking occurs under new circumstances (e.g. a new destination or the availability of a new parking location) or unusual circumstances (e.g. an unusual time of day or having to transport a large, cumbersome package) we believe that drivers are likely to consciously decide where to park. In this process, drivers weigh the pros and cons of the various options and choose the parking location most suited to their needs. In order to understand why people park where, understanding how people make reasoned parking decisions, and upon which factors these decisions are based, is essential. For this reason, we pay much attention to this process in the present study.

For many trips, however, the choice where to park is likely to be driven primarily by habits developed as a result of having made comparable trips many times in the past. The result of these two contrasting decision methods is that the first few times a particular trip is taken, the parking decision is consciously made by weighing the pros and cons of various options. On subsequent journeys, this explicit decision process, which takes time and effort, is essentially skipped, and the decision is made based on what one “normally” does. In terms of the model presented earlier, *Habit* plays a bigger and bigger role in determining *Behaviour*, whereas the role of *Intention* is reduced dramatically. One of the important consequences of such a shift is that different strategies are needed to influence reasoned behaviour than habitual behaviour, because what works for one does not generally work for the other.
In the present study, we ask respondents about the degree to which their parking decisions are dictated by habit. However, the attention given to habit in the present study is not sufficient to understand this complex phenomenon. We believe that habit guides many of our everyday parking decisions, and that it should receive specific attention in future research. We need to better understand how parking habits develop, what their nature is and how elastic they are. The elasticity of habits is a particularly interesting topic for study. How long do habits persist in the face of rising prices? Under what circumstances do drivers deviate from their habitual parking locations? How can we actively change or break parking habits? Do parking habits pertain only to places to park or are they intimately linked to habits in transportation choices?

Until now, much research on parking has concentrated on aspects important to policy-making and infrastructure development (van Hoek, 2000; Metz, Pommer & Zonnenberg, 2002). To our knowledge, there is relatively little work on what drives people to choose one option over another. In the present study, we hope to provide a bit more insight into how these human processes work. In continuing such research, we provide support to relevant parties, in the planning and realisation of an efficient, cost-effective and driver-friendly parking network.

References


