WAITING IS BECOMING FUN!
THE INFLUENCE OF ADVERTISING AND INFOTAINMENT ON THE WAITING EXPERIENCE

Mark van Hagen
Dutch Railways
mark.vanhagen@ns.nl

Ad Pruyn
University of Twente
a.pruyn@utwente.nl

Mirjam Galetzka
University of Twente
m.galetzka@gw.utwente.nl

Judith Kramer
University of Twente
jkramer83@hotmail.com

European Transport Congress, 6-8 October 2009, Noordwijkerhout, The Netherlands

SUMMARY

At train stations, passengers are regularly confronted with waiting times, which is no fun but often inevitable. Depending on the circumstances, waiting for a service can evoke a wide range of negative reactions, such as boredom, irritation, anxiety and stress. These negative emotions influence the customer satisfaction and the evaluation of the service quality (Pruyn & Smidts, 1998). The longer one thinks (s)he has had to wait, the more dissatisfied one is about the service (Durrande-Moreau & Unsunier, 1999; Hui, Dube & Chebat, 1997). In order to shorten the objective waiting time and prevent delays as much as possible, Dutch Railways has been making some considerable investments in new trains and in optimizing the schedule. The question remains what else Dutch Railways can do – besides minimizing the *objective* waiting time – to positively influence the perceived (*subjective*) waiting time. The answer to this question may lie in the correct attention to the role of the service environment when processing information during the wait. The purposeful deployment of specific environmental elements (such as advertising and infotainment) can work as a distractor and as such influence the subjective estimation of time. How these processes exactly work, and how Dutch Railways can purposefully deploy station advertising and infotainment to positively influence the waiting experience, is the focus of this paper.

To this end, we conducted two experiments in a virtual station environment. Study 1 explored whether and how advertising in a station environment influences the experience of both the station and the wait. This was done with a 4 (tempo advertising: no advertising vs static vs slow vs fast) x 2 (activity: peak vs off-peak) x 2 (passenger's travel objective: must vs lust) between-subjects design.
Study II investigated whether and how infotainment in a station environment influences the experience of both the station and the wait. This was done with a 4 (type of programming: no programme vs informative vs current affairs/entertainment vs Railaway) x 2 (activity: peak vs off-peak) x 2 (passenger's travel objective: must vs lust) between-subjects design.

The findings reveal that the presence of platform wall advertising or screens with infotainment do not influence the perceived waiting time or the subjective time factor but that they do positively contribute to the waiting experience. Adding advertising and infotainment make the wait more pleasant. Passengers indicated being more satisfied during the wait, that they experienced the waiting time as being more useful and that they would have no problem returning to a platform with advertising and infotainment. As the objective waiting time cannot be shortened and passengers spend the largest part of their wait (65%) on the platform, we recommend that the waiting environment be as pleasant as possible by offering passengers distraction in the form of infotainment.

1. BASIS AND KEY QUESTION

At the station passengers are regularly confronted with waiting times. Waiting is no fun, but in many situations it is inevitable. People have to wait for and during the rendering of a service. Particularly the wait *before* a service commences, the pre-service wait, is experienced as being unpleasant (Taylor, 1994). Train passengers are confronted with two types of pre-service waiting: pre-schedule waiting and delay. Pre-schedule waiting infers waiting times that occur owing to the passengers arriving at the station too prematurely. Delays arise due to malfunctions in the schedule.
In order to counteract delays as much as possible, Dutch Railways has of late been making some considerable investments in new trains and in optimizing the schedule. The question remains what Dutch Railways can do to positively influence the perceived pre-schedule waiting time. The answer to this question may lie in the deployment of environmental elements (such as advertising and infotainment) as distractors. Deploying distractors is after all a relatively easy and cheap way to manage this period of time, and to make it more pleasant. Several studies have shown that a distractor reduces the perceived waiting time. Advocates of the Attentional model allege, for example, that a distractor reduces people's perception of time because they are being kept cognitively occupied - hence there is less cognitive power to be occupied with the time, which makes it seem to pass more quickly (Pruyn & Smidts, 1998; Thomas & Weaver, 1975). A meta analysis by Durrande-Moreau (1999) comprising18 studies of waiting experience demonstrated that when one is cognitively occupied with an activity, time seems to pass more quickly than when one passively lets it pass by. Adding a distractor to the station environment, such as advertising or infotainment, can therefore cause the passenger's perceived waiting time to be reduced. The key question in this research endorses these views and attempts to examine under which conditions the positive effects of advertising and infotainment are the strongest.

2. SERVICE ENVIRONMENT

As a service is generally produced and consumed simultaneously, the consumer is, as it were, 'in the factory' and thus experiences the service within the physical facilities of the organization. The service environment can thus strongly influence the service experience (Bitner, 1990). There are various studies that reveal how the service environment influences the ultimate satisfaction of the consumer (Bitner, 1990; Pruyn & Smidts, 1998). The environment moreover also influences the evaluation of the quality. A service is not tangible, which is why customers will start to look for aspects in the service environment that tell them something about the upcoming service quality (Brady & Cronin, 2001; Verhoeven, van Rompay & Pruyn, 2009). In the case of Dutch Railways, this is in the station hall and on the platforms. As the service environment is so influential on the perceived service quality and satisfaction, it is important to tailor the service environment to the consumers' needs and preferences.

2.1 Response to service environment

In environmental psychology the relationship between environmental elements and behaviour (approach-avoidance behaviour) is described on the basis of the Stimulus-Organism-Response Model as developed by Mehrabian and Russell (1974). According to the SOR model, the environment is a stimulus (S) that influences the emotional state of the consumer (O) which subsequently has an effect on the consumer's behaviour (R). In this study, the SOR model was used to investigate whether and how advertising and infotainment influence the degree of pleasure, arousal and dominance that passengers experience. Much research has already been conducted on the influence of pleasure on behaviour (e.g. Mehrabian & Russell, 1974). Also the relationship between arousal and behaviour has been shown. However, little attention has yet been paid in the literature to the degree of dominance (Mehrabian & Russell,1974; Russell & Pratt, 1980). Particularly for a station environment, the sense of control, and thus also dominance, is imperative, as are emotional aspects such as feelings of uncertainty and pressure, and ease of orientation. These aspects have thus also been included and discussed in this study.

3. LITERATURE OVERVIEW OF WAITING

Depending on the situation, waiting for a service can evoke a wide range of negative emotions such as boredom, irritation, anxiety and stress (see Pruyn & Smidts, 1993). These negative emotions influence the customer satisfaction and evaluation of the service quality (Pruyn & Smidts, 1998). The longer one thinks (s)he has had to wait, the more dissatisfied one is about the service (Durrande-Moreau & Unsunier, 1999; Hui, Dube & Chebat, 1997).

3.1 Waiting time perception

Over the years, various theories have been developed on how time is experienced, the most important and relevant of which are expounded on here.

The "Attentional model of time perception" argues that during a time interval attention can be processed both temporally and non-temporally. Temporal processing implies that a person is consciously aware of the passing time (e.g. by trying to guess how long one has been waiting). Non-temporal processing is thinking about things that are not time-related. The more temporal information processed, the longer the time interval seems. A pleasant environment, information, activities and other kinds of distraction afford less information being temporally processed, thus reducing the perceived (waiting) time (Bailey & Areni, 2006; Zakay,1991).

The "Contextual change model", on the other hand, predicts that adding a distractor increases the time perception. This is because *the number* of changes (or events) occurring within a certain time interval is associated with (the length of) that interval. The more changes there are per time interval, the longer the perceived waiting time

is (Block, 1990; Zackay & Block, 1997), because it would seem that more has taken place.

3.2 Waiting experience

Several studies have shown that the perceived waiting time plays an important role in the service experience of consumers (Hornik, 1993; Luo et al., 2003; Pruyn & Smidts, 1993). The evaluation of the waiting time can be distinguished in two ways: cognitively and affectively. Whereas the cognitive evaluation concerns the long/short assessment, the affective part relates to the emotional reaction to waiting time, such as irritation, boredom and stress (Pruyn & Smidts, 1998). Pruyn and Smidts' study (1998) revealed that the perceived waiting time predominantly influences the satisfaction with the service via the cognitive response, just as the attractiveness of the waiting environment influences satisfaction via the affective response. Moreover, it appeared that the greatest irritation occurs when one has to wait for a relatively long period of time, is in a hurry and has nothing to do whilst waiting. That irritation is less when the wait is shorter than expected and if one finds oneself in pleasant surroundings (Pruyn & Smidts, 1993).

3.3 Waiting in a station environment

Waiting for public transport is different from waiting for other public services because the wait situations differ in a number of ways. With train transport there is a wait situation without either a queue or formal service rules. The wait situation takes place outdoors, the wait is randomly distributed, and one often receives little feedback during that time (Durrande-Moreau & Unsunier, 1999). The station, moreover, is a special service environment, because passengers are per definition occupied with time. The moment one arrives at the station, one checks the time to see how many minutes there are until the train leaves, or whether the train is delayed or whether there is still enough time to do something, such as buy a cup of coffee.
The train journey from door-to-door consists of (a minimum of) seven links: origin, access mode, transfer, train journey, transfer, egress mode and destination. It is unlikely that the time perception of passengers during this movement chain is constant. From research by Wardman (2004), it appears that the train journey is valued twice as high as the initial and final transport, and three times higher than the transfer waiting time. Waiting time is thus the least valued link in the movement chain. Figure 1 shows the time evaluation of the movement chain. The horizontal axis represents the time and the vertical axis the value of perception. The product of the time spent and the value of perception equals the value of the time spent. This value of time spent can be expressed in usefulness and pleasure (Peek & van Hagen, 2002).

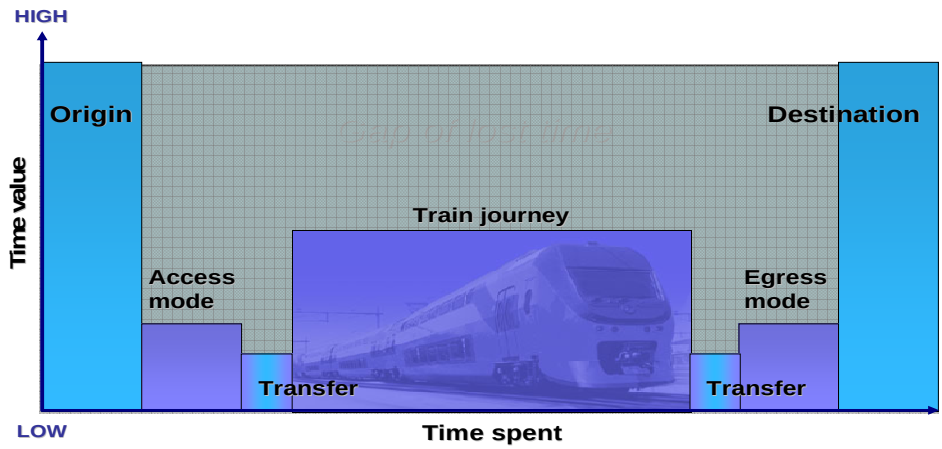

Figure 1: Time evaluation of the movement chain (Time evaluation = Duration x Value of time perception)

According to Peek and van Hagen (2002), there are three ways in which to increase the evaluation of the time spent:

- Acceleration: increasing the average speed of transport modes and shortening the waiting time.
- Concentration: moving location activities (living, working and recreation) closer to the station.
- Enhancement: increasing the time evaluation of the weakly valued links (waiting time).

Making the waiting time less tedious can be particularly achieved by making the waiting environment more pleasant. Passengers' perception value can be increased by offering location activities such as shops, work stations and entertainment at the station and on the platform. A wait thus becomes a stay.
Passengers do not mind a short wait; at times they might even enjoy it. It allows them to change trains and to undertake a brief activity such as drinking coffee or buying a magazine. If the wait is longer, passengers experience it as irritating and unacceptable. A longer wait therefore also demands a higher level of wait services to make it more pleasant (van Hagen & Peek, 2006).
Passengers spend the greatest part of their wait on the platform. Platforms thus have a dual function: a transfer function and a wait/stay function. Both at small stations, where there are no other places to wait, and at large stations, where passengers have the choice to wait in the hall or in commercial facilities, the platform is the

principal waiting location (Peek & van Hagen, 2006). In full view of the train, and hence stress reduction, is for many passengers the reason to opt for the platform as their waiting location.

3.4 Hypotheses

It is apparent from the literature overview that waiting can have a negative impact on customer satisfaction and the service quality. It also appeared how important it is to tailor the environment to the needs and preferences of consumers and that the deployment of a distractor can be a suitable means to reduce the perceived waiting time. On the basis of relationships and connections found in the literature, we formulated the following hypotheses.

According to the “Attentional model of time perception”, explicit distraction causes passengers to be kept cognitively occupied. This means there is less cognitive power left to worry about the time, which seems to make it pass quicker (Thomas & Weaver, 1975; Durrande-Moreau, 1999; Bailey & Areni, 2006). We therefore expect that adding advertising and infotainment to the station environment will have a positive effect on the perceived waiting time. Hypothesis 1a thus reads:

H1a: Passengers experience a shorter perceived waiting time in a station environment with advertising and infotainment than without advertising and infotainment.

According to the “Contextual change model”, explicit distractors such as advertising and infotainment actually result in a more prolonged time interval (the wait), because more seems to have happened during that period. Hypothesis 1b was thus formulated as an alternative to hypothesis 1a:

H1b: Passengers experience a longer perceived wait in a station environment with advertising and infotainment than without advertising and infotainment.

From Brown’s research (1995), it appears that the duration of fast stimuli was perceived as being longer than slow stimuli. Also the perceived time is longer with fast moving images than with slow moving images (Brown, 1995). On the basis of these findings, we expect a slow image tempo to result in a shorter time perception than a fast image tempo. Hypothesis 2 thus reads:

H2: A slow tempo of platform wall advertising results in a shorter subjective waiting time than a fast tempo of platform wall advertising.

Screens on the platform with infotainment also influence the evaluation of the service. The physical service environment is an important factor when assessing the service and is likewise important when determining the quality (Hui, Dube & Chebat, 1997). Advertising and infotainment can be considered an environmental element which can influence the evaluation and quality assessment of the service provider. Adding an environmental element to the service environment can even be compared with the addition of good quality to a product (Bitner, 1992). Hypothesis 3 is thus:

H3: The evaluation of the service and quality is better on a platform with advertising and infotainment than on a platform without advertising and infotainment.

Passengers who experienced the wait as pleasant and who were not bored will return to the station with greater enthusiasm. This expectation was endorsed in research by Hui, Dube and Chebat (1997), who found that a positive affective reaction to waiting time results in greater approach (and less avoidance) behaviour. Hypothesis 4 thus reads:

H4: Passengers on a platform with advertising and infotainment will show more approach behaviour than on a platform without advertising and infotainment.

4 STUDY I: EFFECTS OF THE IMAGE TEMPO OF ADVERTISING ON BUSY AND QUIET PLATFORMS

4.1 Method

This study examined whether and how advertising (as explicit distractor) influences the station and wait experience in a station environment. In an on-line experiment, subjects (members of the Dutch Railways customer panel) were invited to navigate via the computer through a virtual station on the basis of a fixed passenger scenario. Half of the respondents were confronted with a quiet station (see Figure 2; left photo), and the other half were asked to follow the scenario at a busy station, during peak hours (right photo). On the platform, at the exact spot the train was expected to depart from, advertisements were projected onto the walls of the opposite platform under varying conditions of image ‘renewal’. One quarter of the respondents saw ad messages that followed one another relatively quickly (renewal every 20 seconds), one quarter saw ad messages that were renewed more slowly (every 40 seconds), one quarter saw no renewal of the message (i.e. they saw one and the same message during the entire wait), and the final quarter saw no ad message at all (control condition).

Figure 2: quiet (left) vs busy (right) station

Figure 3: platform wall advertising

The eventual experimental design of this study consisted of a 4 (tempo screen change: no advertising vs static vs slow vs fast) x 2 (activity at the station: peak vs off-peak) x 2 (passenger's travel objective: must vs lust) between-subjects design. The aforementioned manipulation (via the instruction scenario) was based on the idea that environmental stimuli can have a different function for passengers who are true goal-oriented travellers than for those who go on a trip for pleasure.
The choice was made for an experimental study in a virtual station environment because it is practical, relatively cheap and because the ecological validity is high as opposed to testing in a real station (Blascovich, Loomis, Beall, Swinth, Hoyt & Bailenson, 2002; Riva, Mantovani, Capideville, Preziosa, Morganti, Villani, et al., 2006). Testing in a virtual station moreover allows manipulation of the objective waiting time per respondent and to record this more easily and accurately.

4.1.1 Procedure

Members of the Dutch Railways customer panel received an email in which they were asked to participate in the study. A link led respondents to an introduction page where they were asked to install a plug-in which was required to let the virtual model run on their computer. After further instructions, respondents were given a scenario to read in which they were asked to catch a specific train. The scenario made it clear whether one was a must passenger (in a hurry for an important meeting) or a lust passenger (not in a hurry and with the prospect of a pleasant day out). Respondents were then sent to the virtual station and randomly assigned to one of the eight conditions (tempo screen change and activity on the platform). The virtual station had

a 10-minute cycle. Respondents entered the cycle at a random moment and thus had a different objective waiting time. After catching the right train, respondents were redirected to the questionnaire.

4.1.2 Respondents

Respondents were all members of the Dutch Railways customer panel and hence a good representative of its daily passenger population. Respondents were free to choose the moment of participation. In total 487 panel members took part in the experiment, of which 303 (62%) were men and 184 (38%) were women. The ages of the respondents were quite evenly distributed (median= 30-39 years). Only the young (<18) and the elderly (>60) were underrepresented with 6.5% and 9.2% respectively. More than half of the respondents (53.6%) had a higher education, a large portion had a home-work travel motive (40.5%) and travelled four days a week or more by train (41.1%). Aforementioned percentages concur with those of the Dutch Railways customer panel. The survey was thus not only a representative reflection of the customer panel but also of the Dutch Railways customer.

4.2 Measurement instrument

After navigating the virtual station and catching the train, respondents had to fill in a questionnaire in order to measure the perception of both station and waiting time. The questionnaire commenced with constructs that measure waiting time perception and were included at the beginning because the wait experience would then still be fresh in the respondent's memory. First asked was the *perceived (subjective) waiting time* in minutes at the station and on the platform with the question: "If you had to guess, how long do you think you were at the station/on the platform?" Then we measured the *cognitive evaluation of the waiting time* (long/short) with the question: "How did you experience the time spent at the station?" (1=very long, 7=very short). Subsequently we measured the *acceptance of the waiting time* by asking how acceptable one found it (1=unacceptable, 7=acceptable). Finally we measured the *affective evaluation of the waiting time* (see Pruyn & Smidts, 1998). This scale comprised 5 items and contained statements such as: "I was irritated with the time I had to wait" and: "I was bored during the wait" (Cronbach's $\alpha = 0.81$).
Then the following constructs were measured (all on 7-point Likert scales):

- Emotions were measured on the basis of Russell and Mehrabian's (1974) PAD-dimensions (Pleasure, Arousal and Dominance), whereby with a semantic differential 18 bipolar concepts were set alongside each other.
- State of mind was measured with the Mood Short Form (MSF) of Peterson and Sauber (1983). The MSF measures the state of mind on the basis of four semantic items (Cronbach's $\alpha = 0.94$).
- Behaviour was measured on the basis of the 'approach' and 'avoidance' scale of Russell and Mehrabian (1974), and consists of five items.

- Attitude to the platform was measured by three composed items (Cronbach's α = 0.88). Examples were: "I feel welcome on the platform" and: "The platform looks pleasant".
- Perceived activity was measured with the aid of the perceived crowding scale (Harrell, Hutt & Anderson, 1980), which consists of three items (Cronbach's α = 0.80).
- Degree of uncertainty was determined with Taylor's (1994) scale (3 items; Cronbach's α = 0.86).
- Attitude to waiting time was measured by analogy with the shopping value scale (Batra & Ahtola, 1991), in which six items help to differentiate the hedonic and utilitarian consumer attitude.
- Degree of orientation was measured by 3 items that addressed how well one could find his/her way and available information (Cronbach's α = 0.87).

The questionnaire also included several manipulation checks on the perceived activity and motivational orientation (passenger type: must or lust)). These checks confirmed the effectiveness of the activity and the must/lust manipulations. Furthermore there were three items that aimed to measure the attitude to advertising at the station (Cronbach's α = 0.95), and finally, several demographic variables (gender, age and education).

4.3 Results study I

General

Subjects navigated on average 7.17 minutes (*SD*=03.59) through the station, 5.06 minutes of which they spent on average on the platform (*SD*=04.35). This means that subjects were on average 2 minutes and 11 seconds en route from the station entrance to the platform. The greatest part of the time was thus spent on the platform (70.5%).

The subjective time factor (STF) is the relationship between the objective waiting time and the perceived waiting time and is calculated by dividing - per test subject – the latter by the former (i.e. perceived waiting time ÷ objective waiting time); the result shows that the waiting time is slightly underestimated at the station (STF=.98 (*SD*=1.09)) and overestimated ((STF=1.26 (*SD*=.47)) on the platform.

Moreover it appears that both the cognitive (*M*=4.17, *SD*=1.61) and the affective evaluation (*M*=4.18, *SD*=.46) of the waiting time scored above the scale average. Subjects hence declared finding the wait sooner short than long and did not react with marked negative emotions. Also the score for pleasure (*M*=4.29, *SD*=.46) was above average, which implies that subjects generally experienced the wait as pleasant.

Effects of the clock

A large number of subjects (81.8%) indicated having looked at the clock – which influences the subjective time factor. Subjects who looked at the clock had a

significantly lower subjective time factor at the station ($F_{(1,484)}$=64.8 p<.01) and on the platform ($F_{(1,487)}$=31.98 p<.01) than subjects who did not look at the clock. This implies that the perceived waiting time of subjects who indeed looked at the clock is significantly closer to the actual waiting time than that of subjects who did not.

Consequences of the (objective) waiting time

The duration of the (objective) waiting time influences the assessment of the wait, emotions and state of mind. Subjects who had to wait long assessed the wait significantly less positively ($F_{(1,479)}$=27.01 p<.01) and found the waiting time less acceptable ($F_{(1,487)}$=7.02 p<.01) than subjects with a short wait. Subjects with a short wait experienced the waiting time as more useful ($F_{(1,481)}$=16.48, p<.01) and more pleasant ($F_{(1,483)}$=4.30, p=04) than subjects with a longer wait. Besides this, subjects experienced significantly more pleasure ($F_{(1,475)}$=5.59, p=.02), stress ($F_{(1,476)}$=15.68, p<.01) and control ($F_{(1,469)}$=3.83, p=.05) with a short wait than with a long one. Also the state of mind was better with a short than a long wait ($F_{(1,473)}$=9.73, p<.01).

Effects of the presence of platform wall advertising

First the question needed to be answered whether the presence of platform wall advertising alters the way in which passengers experience the subjective waiting time (Hypotheses 1a and 1b). No differences were found in the estimations of waiting time as a function of platform wall advertising ($M_{\text{with advertising}}$= 7.17 vs $M_{\text{without advertising}}$= 7.20). The presence of platform wall advertising did not appear to have an effect on the subjective time factor either ($M_{\text{with advertising}}$= 1.26 vs $M_{\text{without advertising}}$= 1.43). Hence both hypothesis 1a and 1b cannot be accepted.

Effects of platform wall advertising were, however, found on the reported affects: the sense of control (dominance) appeared larger in the condition without platform wall advertising than in the condition with ($F_{(1,575)}$=33.90, p<.01). In contrast, subjects experienced greater pleasure with the presence of platform wall advertising than without ($F_{(1,581)}$=29.38, p<.01), just as its presence also scored higher in approach behaviour ($F_{(1,590)}$=4.95, p=.03). Subjects would return to a platform with greater enthusiasm if it had wall advertising and would be more positive about the station to friends and acquaintances than when the platform had no wall advertising. These findings support hypothesis 4, which predicted that platform wall advertising would lead to more approach behaviour from passengers.

Finally, passengers also found that their wait was spent more usefully when there was platform wall advertising than when there was none ($F_{(1,594)}$=13.31, p<.01) and that the time was also more pleasant (with than without) ($F_{(1,596)}$=3.50, p=.06). True, this last difference is not significant but it does show a very strong trend in the predicted direction.

The findings afford a mixed picture of the effects of platform wall advertising: they do not result in other estimations of the waiting time or a decrease in the sense of

control, yet they do seem to contribute to a more positive perception of the environment.

The tempo of renewal of ad messages

In hypothesis 2 we expected that a slow tempo of screen change would result in a shorter subjective waiting time than a fast one. This hypothesis cannot be supported ($F<1$). However, other main effects of the tempo of renewal of the platform wall advertising were found that indeed warrant further investigation of the relationship between image tempo and waiting experience. The *affective* evaluation of the waiting time appeared to be higher with subjects confronted with the fast than with the slow tempo ($F_{(2, 478)}=4.11$, $p=.02$). Hence subjects with the fast tempo were less irritated and found the wait more pleasant than subjects with the slow tempo. The tempo of the platform wall advertising also influenced the *cognitive* evaluation of the wait. In the fast condition the long/short assessment is significantly lower than in the static condition ($F_{(2,483)}=3.43$, $p=.03$). This implies that subjects in the fast condition felt that their wait had been shorter than for those in the static condition. Also this finding is at odds with the expectation formulated in hypothesis 2.

Furthermore, the tempo also influences the acceptance of the wait. In the condition with the slow tempo, subjects found the waiting time less acceptable than in the condition with the fast tempo ($F_{(2, 486)}=3.51$, $p=.03$).

Finally, subjects appeared to be able to orient themselves better with the fast tempo than with the slow tempo ($F_{(2, 480)}=3.29$, $p=.04$).

To summarize: fast screen changes (every 20 seconds) with platform advertising have positive effects on the evaluation of the waiting time (irritation and long/short assessment) and the waiting experience, without this resulting in an actual lower estimated (subjective) waiting time.

Was the platform wall advertising noticed?

A large portion of the subjects (62.4%) indicated to have seen the platform wall advertising. On average they looked at the screen for 0.52 seconds. On enquiry, the presence of the platform wall advertising was valued just below the scale average. Subjects did not find that the presence of the wall advertising improved the appearance of the platform ($M=3.71$, $SD=1.96$), nor that the station as a whole looked better due to the screens ($M=3.87$, $SD=1.92$). This already gives an indication for the testing of hypothesis 3 in which the expectation was formulated that platform advertising would lead to a more positive evaluation of the service quality at the station. A correct testing of hypothesis 3 entailed that subjects who had seen the advertising were distinguished from those who had not. A comparison of the two groups revealed a difference in the overall evaluation of the quality of the platform, albeit the opposite to what we expected: passengers who had seen the wall advertising awarded a lower mark for the platform ($M=6.82$; $SD=1.39$) than

passengers who had not seen it (M=7.15, SD=1.18; $F_{(1,473)}$=6.87, p<.01). Hypothesis 3 is thus rejected.

Must and lust passengers

Motivational orientation (passenger type: must or lust) influences the cognitive evaluation of the waiting time. Lust passengers experienced the wait as shorter (M=4.35, SD=1.79) than must passengers (M=3.95, SD=1.89; $t_{(487)}$=2.63, p =.02) (NB: 1=very long, 7=very short).

Lust passengers could orient themselves better at the station (M=5.73, SD=1.40) than must passengers (M= 5.45, SD=1.53; $t_{(481)}$=2.09, p =.04). It also appeared that the lust passenger could orient him-/herself better when it was quiet (M=5.75, SD=1.45) than when the platform was crowded (M=5.47, SD=1.48; $t_{(481)}$=2.08, p =.04).

Activity

One main effect of platform activity was found: crowds influence the hedonic consumer attitude with regard to the waiting time. When the platform was busy, one found the wait more pleasant (M=4.01, SD=.47) than when it was quiet (M=3.91, SD=.53; $t_{(483)}$=1.99, p =.04).

Also one interaction effect of activity and motivational orientation was found on perceived control (dominance): $F_{(2,467)}$=4.04, p=.04. Lust passengers experienced more control when it was quiet (M=3.83, SD=.64) than when it was busy (M=3.68, SD=.68). Must passengers, on the other hand, actually experienced more control when it was busy (M=3.77, SD=.60) than when it was quiet (M=3.67, SD=.68).

Conclusion

Platform wall advertising seems to result in a quite variegated and interesting pattern of findings. On the one hand, respondents in this study do not react particularly positively when they are asked to pronounce judgement on this form of station advertising. They do not think that such forms of advertising contributes to a positive appearance. On the other hand, the presence of platform advertising does result in all kinds of positive experiential, attitudinal and behavioural effects and so, too, does the tempo of screen change seem worthy of deployment in influencing the waiting experience.

In a second study we will investigate whether these findings can be replicated with another form of distraction in the service environment, namely infotainment. With infotainment particularly the choice of content is definitive for the user's assessment. For this reason, we manipulated the type of programming in the experimental research in order to evaluate the effects of passengers' evaluation and behaviour.

5 STUDY II: DIFFERENT TYPES OF PROGRAMMING INFOTAINMENT ON THE PLATFORM

5.1 Method

In this study we investigated whether and how infotainment (as explicit distractor) in a station environment influenced the perception of both the station and the wait. This was done with a 4 (type of programming: no programme vs (passenger) information vs current affairs/entertainment vs a Dutch Railways promotion film) x 2 (activity: peak vs off-peak) x 2 (passenger's travel objective: must vs lust) between-subjects design. As in study I the experimental design was tested in an online virtual station. On the virtual platform - at the spot where the train was expected to arrive - screens had been placed on which non-stop infotainment was shown (see Figure 4). One quarter of the subjects were able to watch an informative programme with passenger information, one quarter saw a current affairs/entertainment programme, one quarter could watch a promotion film of Railways (Railaway), and the final (control) group saw nothing but a dark screen.

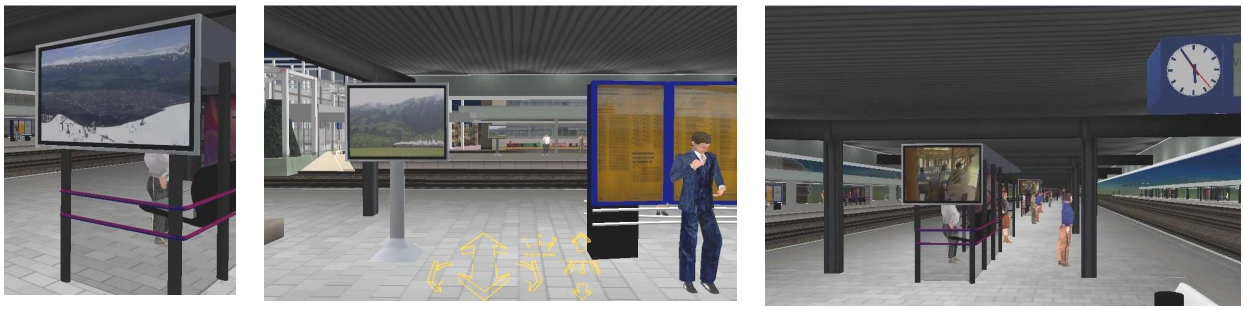

Figure 4: Screens with infotainment

5.1.1 Subjects

As in study I, we used the Dutch Railways customer panel. In total 15,323 panel members received an invitation to the research. Ultimately, 898 panel members participated in the experiment, of which 532 (58.8%) were men and 366 (41.2%) were women. The ages of the subjects were quite evenly distributed (median=30-39 years). Only the young (<18) and the elderly (>60) were underrepresented with 8.2% and 10.3% respectively. More than half of the subjects had a higher education (54.7%), a large portion had a home-work travel motive (36.8%) and travelled four days a week or more by train (37.3%). Aforementioned percentages concur with those of the Dutch Railways customer panel. The survey was thus not only a representative reflection of the customer panel but also of the Dutch Railways customer.

5.2 Measurement instrument

After navigating the virtual station and boarding on a train, respondents had to fill in a questionnaire in order to measure the influence of infotainment on the perception of both station and waiting time. The reliability analyses and findings of the first study did not warrant any major changes and/or addition of constructs; only the constructs used in study I to measure the attitude to advertising were adapted to a scale that measured the attitude to the programming.

Owing to the outspoken support found in study I for hypothesis 4, in which platform advertising was predicted to lead to greater approach behaviour, this variable was not measured in study II. Also hypothesis 2 could not be tested in study II, because with the infotainment the tempo of the screen change was not manipulated.

5.3 Results study II

General

Subjects navigated on average 7.22 minutes (*SD*=04.12) through the station, 4.52 minutes of which they spent on average on the platform (*SD*=05.19). This means that they were on average 2 minutes and 30 seconds en route from the station entrance to the platform. The greatest part of the time (62.6%) was thus spent on the platform. The subjective time factor (STF) indicates that the waiting time was overestimated both at the station and on the platform (STFstation=1.29 (*SD*=.86); STFplatform=1.30 (*SD*=2.09)).

Moreover it appears that both the cognitive (*M*=4.47, *SD*=1.80) and the affective evaluation (*M*=4.98, *SD*=1.80) of the waiting time scored above the scale average. Also the score for pleasure (*M*=4.54, *SD*=.97) was above average. As in study I, subjects found the waiting time in general sooner short than long, that this did not make them feel uncomfortable and that they even experienced the wait as pleasant.

Effects of the clock

A large portion of the subjects (72.6%) said they had looked at the clock. Looking at the clock influences the subjective time factor. Subjects who did look at the clock had a significantly lower subjective time factor at the station ($t_{(885)}$=2.36 p<.02) and on the platform ($t_{(885)}$=3.18 p<.01) than subjects who did not look. This implies that the perceived waiting time of subjects who indeed looked at the clock was significantly closer to the actual waiting time than that of subjects who did not.

Was the infotainment noticed?

The majority of the subjects (67.5%) indicated having seen the screens. On average they looked at them for 53 seconds. When there was no programming, a larger portion of the subjects (52.5%) admitted to not having seen the screens, as opposed to when there was programming (27.5%). This suggests that the moving images almost certainly attracted attention to the screens.

The presence of the screens were generally valued above the scale average. Subjects found that the presence of screens improved the appearance of the platform (*M*=4.63, *SD*=1.74), and that the screens gave them the impression their wait was shorter (*M*=4.73, *SD*=1.78). So it would seem that infotainment (as opposed to the platform wall advertising in study I) is regarded as an improvement of the station environment. Infotainment via screens also resulted in a better assessment of the platform ($F_{(3,864)}$=4.23, *p* <.01). Subjects who admitted to having seen screens awarded a higher mark to the platform (*M*=7,29, *SD*=0,99) than those who either did not see a screen or who only saw a dark screen (M=6,90, SD=1,26). This implies that – in contrast to the findings in study I – hypothesis 3 for infotainment can indeed be confirmed.

Effects of the presence of infotainment

First we answered the question whether the presence of infotainment has a different effect on how the subjective waiting time of passengers was experienced (Hypotheses 1a and 1b). As opposed to study I, differences with infotainment were indeed found in the estimations of the waiting time ($M_{\text{with infotainment}}$= 8.26 vs $M_{\text{without infotainment}}$= 6.42). Subjects who had seen the screens gave on average higher estimations of the waiting time on the platform. It seems that hypothesis 1b can be confirmed for the infotainment stimuli and would hence also support the 'Çontextual changes model' and not the 'Attentional model' of time perception. However, closer analysis reveals that subjects who saw the screens also spent a significantly longer time on the platform (M=5.35) than those who had not seen the screens (M=3.23). In their study of the influence of television in hospital waiting rooms, Pruyn and Smidts (1998) found that people who watched TV estimated the waiting time as being longer than those who did not. It appeared, however, that people who had watched TV had objectively had a longer wait. Pruyn and Smidts (1998) posit that people only look at the screen when they start to get bored, i.e. when they have already been waiting for a while. " Presumably, people start to watch TV only after some time. Our results would rather seem to indicate that it is sooner the length of the wait (and thus boredom) that induces people to start watching" (Pruyn & Smidts, 1998, p 332)

What kind of programming is appreciated?

In the conditions with infotainment, subjects were generally more positive about the platform than in the condition in which no infotainment was shown; hence this offers (extra) support to hypothesis 3. Having also asked the subjects (7-point Likert scales) what type of programming they found the most suitable on the platforms, it appeared that Dutch Railways-related (passenger) information was regarded as the best type (*M*=6.32, *SD*=1.15), followed by current affairs/entertainment (*M*=5.35, *SD*=1.69). Advertising and promotion were considered the least suitable (*M*=2.45, *SD*=1.60). A variance analysis demonstrated that there was no connection between the type of programming seen and the assessment of the suitability of the different types.

Other analyses showed that there were no main effects of type of programming, although several interesting interaction effects were found.
Lust passengers (*M*=4.11, *SD*=.14) valued the informative programming higher than must passengers (*M*=3.71, *SD*=.15; $F_{(1,508)}$=3.82, *p*=.05; see Figure 5). Notably the current affairs/entertainment programming was valued higher by must passengers (*M*=4.29, *SD*=.16) than by lust passengers (*M*=3.86, *SD*=.17; $F_{(1,508)}$=3.34, *p*=.06). There appeared to be no differences between lust and must passengers when there was no programming and with the Railaway promotion film.

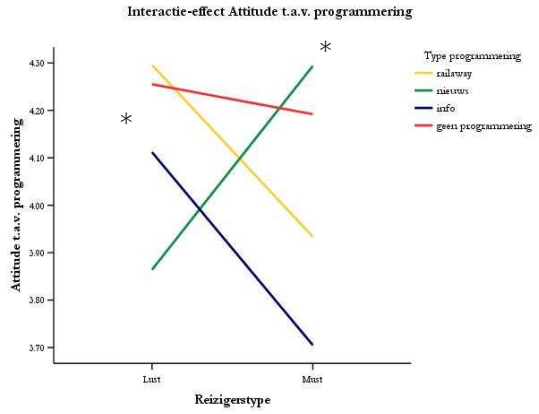

Figure 5: Interaction effect passenger type and programming on attitude to programming

* Only in the conditions with an asterisk are the differences between lust and must passengers significant (with (passenger) info and current affairs/entertainment programmes).

An interaction effect was found of activity and type of programming on the perceived waiting time ($F_{(3,881)}$=2.55, *p*=.05; see Figure 6). When there was no programming, the perceived waiting time was shorter when the platform was quiet (*M*=6.25, *SD*=.52) than when the platform was busy (*M*=8.29, *SD*=.51); $F_{(1, 881)}$=7.96, *p*<.01). This difference did not appear to be significant for current affairs/entertainment, informative and Railaway programming. This finding places hypothesis 1a, which was rejected earlier, in a remarkable perspective. The fact of the matter is that Figure 6 demonstrates that distractors – particularly in the form of news and passenger info – can indeed lead to lower time estimations (in comparison with no programming), but that this only occurs on busy (not on quiet) platforms. On quiet platforms, infotainment appears to result in higher subjective waiting times. These findings suggest that the 'Attentional model' offers a good explanation on platforms where much is going on: activity combined with distraction by infotainment. On quiet platforms no support could be found for either of the two models of time perception.

Also an interaction effect of activity and type of programming was found on dominance (perceived control) ($F_{(3,842)}$=3.15, *p*=.03; see Figure 7). In the current

affairs/entertainment variant, greater control was experienced when the platform was busy (*M*=4.37, *SD*=.07) than when the platform was quiet (*M*=4.14, *SD*=.07; $F_{(1, 842)}$=5.87, *p*=.02). This difference did not appear to be significant in the conditions of no programming, informative and Railaway programming.

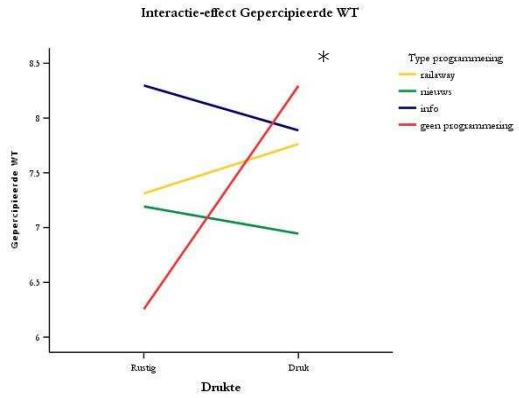

Figure 6: Interaction effect activity and programming on perceived waiting time

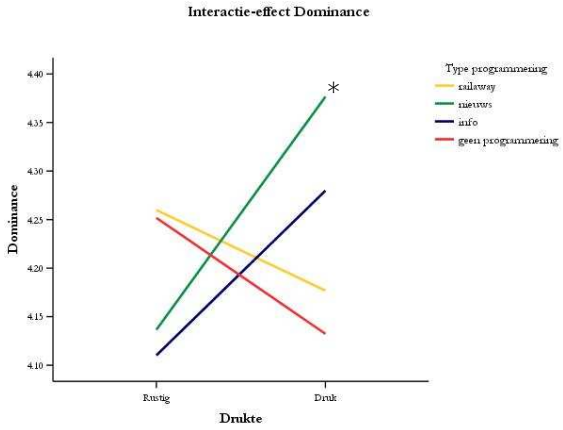

Figure 7: Interaction effect activity and programming on dominance (perceived control)

* Only in programme conditions with an asterisk is the difference between quiet and busy significant.

6 CONCLUSIONS

The pattern of results emerging from both studies is quite subtle and in some cases unexpected. It would seem that in study I the appraisal of the platform wall advertising was negative, whereas positive behavioural effects did indeed occur as were also the possibilities to influence the time perception with the image tempo convincingly demonstrated. True, subjects made it known that they were not interested in advertising, nor did they find platform advertising suitable, but they did allow themselves to be influenced by it nevertheless. The presence of platform wall advertising moreover produced positive affective reactions. Subjects indicated enjoying themselves more during the wait and experiencing the waiting time as more useful and more pleasant when platform wall advertising was present. These results suggest that one can consciously express a negative opinion of such forms of advertising (i.e. when explicitly asked), yet still affectively and unconsciously react to it positively.

Passengers reacted with greater enthusiasm to infotainment on the platform screens (study II). In their opinion, infotainment offers a more positive contribution to the appearance of the station and actually leads to more positive reactions and higher marks. It would seem, however, that the positive effects on the behaviour (the time estimations) can be predominantly expected during peak hours on the platform and not when the platform is quiet. This suggests that the 'Attentional model' of time perception particularly applies when there is already some environmental interference present. In such a condition, infotainment apparently distracts the attention away from the internal clock..

The premise on designing the virtual station environment and the task assigned to the subjects, was that of a 'normal' situation at the station, in which the passenger arrives and has to catch a train within several minutes. The standard protocol did not incorporate delays so there were no exceptionally long waiting times. This might well be the reason why reactions to the waiting times and the waiting experience were quite positive in both studies. Of course one can wonder whether the subjects' reactions would still be the same if they had had to wait longer after arrival at the station (due to delays and the like).
Despite the fact that there is little mention of irritation with waiting, the passengers' perceived waiting time does differ from the actual waiting time. On scrutinizing the subjective time factor, it appears that (particularly in study II) the waiting time is generally overestimated. So there is a considerable difference between the clock time and the perceived time. Both studies moreover reveal that the duration of the wait (long/short) influences the assessment of the waiting time, emotions and the state of mind. Passengers have a strong preference for, and feel better with, a short wait.

6.1 Practical implications

A number of effects were found of the presence of the two kinds of platform distractors that are directly relevant if the decision were made to actually exploit (either of) them.
First it appeared that with platform wall advertising the tempo of screen change can be deployed to influence the perception and experience of waiting time. This finding makes platform wall advertising an excellent instrument to favourably improve the total *servicescape* without the passenger being aware per se of these positive effects.
On a quiet platform passengers experience greater pleasure when the tempo of the platform wall advertising is slow. When the platform is busy, then it is the fast tempo that gives the greater pleasure. An explanation for this phenomenon may be found in the social psychological theories of '(in)congruence'. Congruence means that someone's needs, wishes and preferences correspond to or match the situation in which one finds oneself and this usually leads to higher satisfaction. Incongruence between need and situation, on the other hand, leads to people feeling less comfortable in that situation (Spokane, Meir & Catalano, 2000). It has also been shown (van Rompay & Pruyn, in press), that (in)congruence between varying aspects of the design of products can result in a better (or worse) *processing fluency*, and hence to a more positive (or negative) assessment. In the case of passengers waiting on the platform, we suspect that congruence between the tempo (fast/slow) of the platform wall advertising and the environment (quiet/busy) positively affects the degree of pleasure because it enhances processing fluency. Incongruency (e.g. fast tempo of screen changes in combination with a quiet platform, or slow tempo in

combination with a busy platform) is not highly valued by passengers, due to lower processing fluency.

Infotainment leans more on content and programming. Lust passengers value the informative programming higher than must passengers. The news variant (current affairs/entertainment), on the other hand, is valued higher by must than lust passengers. This is probably because lust passengers are less accustomed to the station and thus display more information-seeking behaviour. For must passengers the informative variant offers little added value (i.e. extra information), which results in a lower assessment, whereas the news variant does have the content the must passenger values. Whatever the case, for the practical organization of the programming these findings offer interesting leads: a segmented supply of the type of information during peak and off-peak hours.

Lust passengers experience more dominance (perceived control) when it is quiet on the platform and must passengers when it is busy. This is probably due to passengers' experience and expectations. A must passenger is used to travelling in peak hours and will therefore be accustomed to and expect a busy platform. A lust passenger, on the other hand, travels primarily during off-peak hours and thus expects a quiet platform. When the situation on the platform does not match the expectation and experience, there is less sense of control.
Perceived activity has a positive influence on the hedonic consumer attitude. This implies that when the platform is busy one will find the wait more pleasant than when it is quiet. An explanation for this effect may lie in the concept of optimal social contact (Eroglu, Machleit & Barr, 2005; Sundstrom, 1977), which presupposes that large, empty spaces (such as a quiet platform) evoke a sense of isolation and do not offer an optimal climate for social interaction. People are just not partial to waiting in a large, empty space, hence the consequence that waiting time is experienced as being more pleasant on a busy platform. An alternative explanation (Pruyn & Smidts, 1999) is that people prefer to share unpleasant (waiting) experiences with others ("a problem shared is a problem halved"), and that the presence of others can even reinforce the relief when the waiting time is relatively short (social facilitation).

6.2 Recommendations

In conclusion we can state that although the presence of platform wall advertising or screens with infotainment does not directly influence the perceived waiting time or subjective time factor, it does nevertheless contribute positively to the waiting experience. Adding platform wall advertising or screens with infotainment 'sweetens' the wait.
Seeing as with public transport the objective waiting time can often not be shortened, and passengers spend the largest part of their wait on the platform (65%), we recommend making the waiting environment and waiting conditions as pleasant as

possible. Particularly the deployment of screens with infotainment (with considered programming and under optimal conditions of screen changes) would seem an interesting instrument to influence the perception of the wait. Further research should uncover which effects can be expected under more extreme conditions of delay.

It is apparent from both studies that looking at the clock significantly lowers the subjective time factor. That is to say, the perceived waiting time of subjects who did look at the clock is closer to the actual waiting time than for those who did not. We thus recommend increasing the accessibility to the objective time, for example, by placing extra clocks on the platform or by showing the time on the screens.

As this research was carried out in a virtual, simulated station environment, the effects should be replicated in a realistic field experiment before implementing the conclusions of these studies. Our procedure, however, appears to be a highly appropriate method for estimating subtle changes (such as tempo of screen change or programme content) in a relatively cheap way without actually having to organize these conditions in a real-life setting. Moreover, this method had the advantage that for each subject the 'journey through the station' took place under the same conditions and that the findings cannot (therefore) be attributed to 'experimental interference' and coincidences that occur per definition in realistic field experiments.

7 Literature

Bailey, N. & Areni, C.S. (2006). When a few minutes sound like a lifetime: does atmospheric music expand or contract perceived time? *Journal of Retailing, 82* (3), 189-202.

Batra, R., & Ahtola, O.T. (1991). Measuring the hedonic and utilitarian sources of consumer attitudes. *Marketing Letters, 2*(2), 159-170.

Bitner, M.J. (1990). Evaluating service encounters: the effects of physical surroundings and employee responses. *Journal of Marketing, 54,* 69-82*.*

Bitner, M.J. (1992). Servicescapes: the impact of physical surroundings on customers and employees. *Journal of Marketing, 56*, 57-71.

Blascovich, J., Loomis, J., Beall, A.C., Swinth, K.R., Hoyt, C.L. & Bailenson, J.N. (2002). Immersive Virtual Environment Technology as Methodological Tool for Social Psychology. *Psychological Inquiry, 13* (2), 103-124.

Block, R.A. (1990). Models of psychological time. In: R.A. Block (Ed.),*Cognitive models of psychological time.* Hillsdale, NJ: Erlbaum*. (pp.* 1-35).

Brady, M.K., & Cronin, J.J. (2001). Some new thoughts on conceptualizing perceived service quality: a hierarchical approach. *Journal of Marketing, 65*(3), 34-49.

Brown, S.W. (1995). Time, change and motion: the effects of stimulus movement on temporal perception. *Perception & Psychophysics*, *57*, 105-116.

Durrande-Moreau, A. (1999). Waiting for service: ten years of empirical research. *International Journal of Service Industry Management*, *2*, 171-189.

Durrande-Moreau, A. & Usunier J.C. (1999). Time styles and the waiting experience. *Journal of Service Research*, *2*, 173-186.

Eroglu, S.A., Machleit, K. & Barr, T.F. (2005). Perceived retail crowding and shopping satisfaction: the role of shopping values. *Journal of Business Research, 58*, 1146-1153.
Hagen, M. van & Peek, G.J. (2006). Prettiger reizen met de trein. NS-klantwensenpiramide is leidraad voor trein én stationsomgeving. *Verkeerskunde*, *5*, 50-55.
Harrell, G.D., Hutt, M.D., & Anderson, J.C. (1980). Path analysis of buyer behavior under conditions of crowding. *Journal of Marketing Research, 17* (1), 45-51.
Hornik, J. (1993). The role of affect in consumers' temporal judgment. *Psychology & Marketing 10* (3), 239-255.
Hui, M.K., Dubé, L. & Chebat, J.C. (1997). The impact of music on consumers' reactions to waiting for services. *Journal of Retailing, 73* (1), 87-104.
Kaltcheva, V.D. & Weitz, B.A. (2006). When should a retailer create an exciting store environment? *Journal of Marketing, 70*, 107-118.
Luo, W., Liberatore, M.J., Nydick, R.L., Chung, Q.B. & Sloane, E. (2003). Impact of process change on customer perception of waiting time: a field study. *International Journal of Management Science, 32*, 77-83.
Mehrabian, A. & Russell, J. (1974). An approach to environmental psychology. Cambridge, MA: MITPress.
Nie, W. (2000). Waiting: integrating social and psychological perspectives in operations management. *Omega, 28* (6), 611-628.
Peek, G.J. & Hagen, M. van (2002). Creating Synergy In and Around Stations: Three Strategies In and Around Stations, Transportation Research Record, *Journal of the Transportation Research Board*, *93*, 1-6.
Peek, G.J. & Hagen, M. van (2006). Maak het snel mooier. *Nova Terra* 6 (2), 31-35.
Peterson, R.A. & Sauber, M. (1983). A Mood scale for survey research. *American Marketing Association*, 409-414.
Pruyn, A. & Smidts, A. (1993). Consumentenreacties bij wachtrijen (deel II): een theoretisch raamwerk. *Tijdschrift voor Marketing, October, 40-46 .*
Pruyn, A. & Smidts, A. (1998). Effects of waiting on the satisfaction with the service. Beyond objective time measures. *International Journal of Research in Marketing,15,* 321-334.
Pruyn, A. & Smidts, A. (1999). Customers' reactions to waiting: Effects of the presence of 'fellow sufferers' in the waiting room. In: E.Arnould & L.Price (Eds.), *Advances in Consumer Research (vol. XXVI)*. Provo, UT: Association for Consumer Research, 211-216.
Riva, G., Mantovani, F., Capideville, C. S., Preziosa, A., Morganti, F., Villani, D., Gaggliolo, A., Botella, C. & Alcañiz, M. (2006). Affective Interactions Using Virtual Reality: The Link between Presence and Emotions. *CyberPsychology & Behavior, 10*(1), 45-56.
Rompay, T.J.L. van & Pruyn, A.T.H. (in press); When visual product features speak the same language: Effects of shape-typeface congruence on brand perception and price expectations. *Journal of Product Innovation Management*, (to appear early 2010).
Russell, J.A., & Mehrabian, A. (1977). Evidence for a three-factor theory of emotions. *Journal of Research in Personality, 11* (3), 273-294.
Spokane, A.R., Meir, E.I. & Catalano, M. (2000). Person-environment congruence and Holland's theory: a review and reconsideration. *Journal of Vocational Behavior, 57*, 137-187.

Taylor, S. (1994). Waiting for service: the relationship between delays and evaluations of service*. Journal of Marketing 58,* 56-69.
Thomas, E.A. & Weaver, W.B. (1975). Cognitive processing and time perception. *Perception and Psychophysics, 17*, 363–376.
Verhoeven, J.W.M., Rompay, T.J.L. van & Pruyn, A.T.H. (2009). The price facade: Symbolic and behavioural price cues in service environments. *International Journal of Hospitality Management, 28,* 604-611.
Zackay, D & Block, R.A. (1997). Temporal cognition*. American Psychological Society, 6* (1), 12-16.

