Waiting for Service at the Checkout: 
Wait Experience, Store Image and 
Overall Satisfaction

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MAR10-11

Institute for Management Research

Working Paper Series in Management
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1. Introduction

Service has been a major field of study in marketing for the past several decades. The focus on service in operations management is a relatively new development, as emphasized by an increasing number of special issues in authoritative journals, such as the Journal of Operations Management (Verma et al., 2002), Production and Operations Management (Boyer and Metters, 2004; Roth and Menor, 2003a; Rust and Chase, 1999), Decision Sciences (Brethauer, 2003) and Management Science (Chase and Heskett, 1995). Customers and their attitudinal and behavioral responses to service are an integral part of the service value chain that must be well understood if we are to create a better and more efficient service experience (Hume et al., 2006; Johnston, 2005; Roth and Menor, 2003b; Tseng et al., 1999). As suggested by Rust and Chase (1999) and Kellogg and Nie (1995), the current study combines ideas and methods from marketing and operations management to develop a better understanding of the behavioral aspects of waiting in line (cf. Bendoly et al., 2006). The study further aims to turn this understanding into actionable recommendations for service managers.

Queuing has been investigated in operations research (cf., Seawright and Sampson, 2007, p. 1056). However, according to these authors the operations literature generally fails to incorporate the psychological costs associated with waiting. In marketing literature, waiting has been associated with a lack of perceived service quality or even service failure and customer dissatisfaction (Bitner et al., 1990; Clemmer and Schneider, 1993; Tom and Lucey, 1995). It may also play a role in the perceived severity of service failures (Craighead et al., 2004). Waiting at the checkout can, to a certain extent, be considered as a peak experience (Kahneman et al., 1997; Verhoef et al., 2004), since it is often one of the most dissatisfying events during the shopping experience (Caballero et al., 1985) and therefore service managers are rightfully concerned about the effects of negative emotions caused by waiting for service on overall satisfaction (Arnold et al., 2005; Taylor, 1995).
Although identified as a research priority in service operations management (Chase and Apte, 2007; Hill et al., 2002), research on customers’ responses to wait times, together with the behavioral antecedents and consequences of the wait experience, remains relatively scarce (Bendoly et al., 2006; Hui and Tse, 1996; Seawright and Sampson, 2007; Stewart, 2003; Taylor, 1995; Tom and Lucey, 1995). In the present study, we focus on the wait experience that starts at the moment the customer is ready for the service encounter and that ends when the encounter starts (Taylor, 1994). More specifically we focus on waiting at the checkout counter, i.e. waiting for the final service encounter (Haynes, 1990), and how this experience influences the overall evaluation of the retail service. Although waiting also occurs in other parts of the retail experience, for example at the fresh foods counter, on the parking lot, or when obtaining help from a store employee, we believe that waiting at the checkout counter is exemplary for waiting in a retail context in general, and a relatively salient and much disliked wait experience at that (cf. Davis and Heineke, 1998; Haynes, 1990).

We also respond to the call to apply field study methodologies in service operations management research (Meredith, 1998; Meredith et al., 1989). Following Seawright and Sampson’s (2007) suggestion to further investigate factors that influence the perceived duration of a waiting period, we build on their conceptual model to include factors from Maister’s theoretical work (1985) and empirically validate it with data from a field study.

Most field studies in the domain of waiting have been conducted in bank (Chebat et al., 1995; Hui et al., 1997; Katz et al., 1991) and airport settings (e.g., Dawes and Rowley, 1996; Folkes et al., 1987), or in experimental settings simulating a hospital, bank, purchase or consultancy experience (Dellaert and Kahn, 1999; Dubé et al., 1989; Pruyn and Smidts, 1998, 1999). Few studies have focused on lines at retail outlets (Jones and Peppiatt, 1996; Tom and Lucey, 1995), which are nonetheless an intrinsic part of the retail service experience (Rafaeli, 1989). Little is known about how waiting at the checkout of a grocery store affects overall
satisfaction with the retailer (Haynes, 1990), or what the relative contribution of the wait experience is, compared to other antecedents of overall satisfaction. Research on factors that can be influenced by service managers, e.g., the service design (Roth and Menor, 2003b; Voss et al., 2008), is similarly lacking (Baker and Cameron, 1996; Cameron et al., 2003; Pruyn and Smidts, 1998). We therefore investigate antecedents and consequences of customers’ responses to waiting at supermarkets and compare their effects with respect to a commonly used antecedent of customer satisfaction in the retail environment, the store image.

The current study highlights how various aspects of service, or the service design, can influence the customer experience (Cook et al., 2002; Roth and Menor, 2003b). Managing the wait experience allows organizations to directly improve their competitiveness in the market (Hill and Joonas, 2005; Johnston, 2005; Kumar, 2005). The article is structured as follows. We first review the literature, identifying antecedents of the wait experience and customer satisfaction in a retail environment. After deriving a theoretical model, we explain our research framework and report our findings from a field study. We arrive at several conclusions, including theoretical implications and specific recommendations for managing checkout lines and minimizing the negative impact on overall satisfaction. Furthermore, we discuss several limitations of the study and offer suggestions for further research.

2. Theory

The checkout is an essential part of many service encounters, and waiting at the checkout is often difficult to avoid. Variations in wait duration in a checkout line are relatively small, compared to those of other waiting situations, such as airplane delays or waiting in a hospital. The way customers experience and evaluate their wait appears to be more influential than the objective duration of the wait. Regarding the effect on overall satisfaction, customers’ wait experience appears to be more important than other store quality perceptions or store image (Houston et al., 1998; Larson, 1987). This phenomenon may be due to the increasing
importance and value of time in our society (Heineke and Davis, 2007). In the following paragraphs, we first explore the concept of wait experience, and contrast it with store image, and we then investigate the role of its antecedents and consequences in a grocery store setting. The research model used in the study is presented in Figure 1.

2.1 Wait experience

Waiting during or before service delivery was proposed to have a direct effect on customer satisfaction (Bitner et al., 1990; Clemmer and Schneider, 1993; Tom and Lucey, 1995). In particular cases, this relationship does not appear to hold. For example, Pruyn and Smidts (1998) did not find a significant effect of the wait evaluation on satisfaction in the case of service in a hospital setting. Hospital waits may be perceived to be an uneventful, fair, and necessary part of the experience, passively undergone by the patient, and therefore fail to affect satisfaction. However, we expect the effect of the wait experience on overall retailing satisfaction to be significant in a situation where customers less submissively undergo the wait, nor see it as an indispensible part of their retailing experience (Davis and Vollmann, 1990). In the case of supermarket checkouts, situational factors may vary, even between lines, affecting the wait experience. Buying groceries is an everyday experience, and the wait situation can easily be assessed by customers and compared to past experiences (Dasu and Rao, 1999).

Finally, customers who are relaxed, joyful and not bored during the wait are likely to better evaluate their overall shopping experience and vice-versa (Taylor, 1994, 1995; Westbrook, 1987). We therefore hypothesize:

**H₁.** The wait experience directly and positively influences overall satisfaction with the retail experience.
2.2 **Store image**

The wait experience at the checkout is proposed to be an antecedent of overall satisfaction. In previous research customers were found to evaluate their overall shopping experience using various other dimensions (Dick *et al.*, 1995; Hui *et al.*, 1997). The concept of store image is often used to explain customers’ satisfaction with a store. Several store characteristics, which appear unrelated or complementary to the wait experience, converge in the concept of store image. Bloemer and De Ruyter (1998, p. 501) define the store image as “a consumer’s perceptions of a store on different (salient) attributes.” Three fundamental dimensions of the store image have been identified: 1) the store’s physical layout or service-scape (Bitner, 1992; Richardson *et al.*, 1996; Zeithaml *et al.*, 1993), 2) its products or merchandise and 3) interactions with store personnel (Baker *et al.*, 1994; Grewal *et al.*, 2003). In line with previous research, we hypothesize that next to wait experience:

**H$_{2a}$**. Store image directly and positively affects overall satisfaction with service.

Since the store image is the result of a global evaluation of the store, generally measured after the wait experience at the checkout, we hypothesize that store image perceptions will be affected by the wait experience. This effect can be explained using mood-congruency theory: mood (*in casu: the result of the wait experience*) tends to bias perceptions and evaluations in a mood-congruent direction (Gardner, 1985).

**H$_{2b}$**. The effect of the wait experience on overall satisfaction is mediated by store image perceptions.
2.3 The waiting area

The relationship between the (physical) store environment and satisfaction has been studied elsewhere (Baker et al., 1994). Customers rely on tangible cues and physical evidence, such as the appearance and layout of the physical facilities, to develop expectations (Zeithaml et al., 1993) and make quality judgments (Zeithaml and Bitner, 2000). Attractiveness of a waiting area has been associated with higher levels of customer satisfaction (Grewal et al., 2003; Pruyn and Smidts, 1998). In our view, the perceived attractiveness of the waiting area would affect the wait experience, rather than global satisfaction with the store because it conditions the wait. Thus, we hypothesize the following, in partial accordance with Pruyn and Smidts (1998):

$H_3$. Perceived waiting area attractiveness positively influences the wait experience.

2.4 Perceived wait duration

Waiting is a subjective experience (Baker and Cameron, 1996; Hornik, 1984) and is not necessarily directly related to objectively measured wait times. Taylor (1994) observed only an indirect effect between actual wait time and satisfaction, which was confirmed by Pruyn and Smidts (1998). Often, customers' perceptions of time differ from objectively measured time (Hirsh et al., 1956; Hornik, 1984). Perceived duration of the wait, more than objective duration, seems to affect consumer experiences, evaluations and behaviors (Barnett and Saponaro, 1985; Dubé et al., 1991; Seawright and Sampson, 2007; Yan and Lotz, 2006). Perceived wait duration should therefore be considered a key construct in explaining customers’ wait experience (Hornik, 1984). Service operations managers may also be able to more directly influence, and at a lower cost, the wait experience rather than actual waiting times. Hence, we hypothesize:
**H₄.** Perceived duration of the wait directly and negatively influences the wait experience.

### 2.5 Wait attribution

How customers explain why they have to wait affects how waiting is experienced. “Wait attribution theory is concerned with how people make wait attributions – how they explain events and assign causes or blame for various outcomes” (Clemmer and Schneider, 1993, p. 215). When a wait is longer than expected, customers try to figure out why. In a retail context, a customer may, for example, attribute the cause of an unusually long wait to a slow customer in front of him or her, or to an inefficient and slow cashier. Similarly, a line that is short or moves very quickly may be attributed to an efficient cashier, to customers emptying their carts quickly or to the availability of multiple checkout lines.

Bitner (1990) showed that the level of perceived control of the provider over a service failure affects the evaluation of the service. Taylor (1994) found a negative effect of perceived control on waiting time perceptions. The more the wait is attributed to factors not controlled by customers, but by the store, the more negatively the wait experience is evaluated. Therefore:

**H₅.** Attribution to the store of the causes for the wait negatively influences the wait experience.

### 2.6 Distraction

Awareness of the passage of time results in boredom (Maister, 1985). Time passing without anything happening has a negative impact on the wait experience and subsequent service evaluation (Jones and Peppiatt, 1996). Distraction increases mental activity and takes
attention away from the passage of time (Katz et al., 1991; Zakay, 1989; Zakay and Hornik, 1991). When time is perceived to be filled, less attention is paid to the passage of time, resulting in higher levels of wait experience (Antonides et al., 2002; Taylor, 1995).

Larson (1987, p. 897) suggests for example that “an actual wait reduction may not be as important as imaginative lobby design,” demonstrating that live entertainment in a bank setting, in the form of music and exhibitions, results in a positive wait experience score. Pruyn and Smits (1998) fail to find support for these conclusions in a hospital setting, where the reason for the visit may be a broken leg or a painful cut that inhibits distraction. For grocery customers, however, we expect distraction to have a positive impact on the wait experience and hence on the service evaluation (Hui et al., 1997). Therefore:

H6. Distraction directly and positively influences the wait experience.

2.7 Social justice

Much research has focused on perceived fairness and justice as antecedents of satisfaction in the context of service failures. Previous research suggests that waits that are perceived to be unfair will feel longer than waits that seem fair (Haynes, 1990; Jones and Peppiatt, 1996; Maister, 1985). Notions of fairness are central to customer satisfaction (Tax et al., 1998). It is likely that this relationship between perceived fairness and satisfaction is also present in the field of wait perception. Maister (1985) and Larson (1987) also reference the concept of social justice in wait settings. Larson (1987, p. 896) suggests that “in customers’ perceptions of queues, fear of social injustice can often dominate queue waiting times.” Incidents may occur, which can be perceived as unfair. For example, imagine that, after having stood in line for 10 minutes, a customer is about to be assisted. However, an additional checkout line opens and “newcomers” scurry over to the new register, where they are served approximately in a last-
come, first-served manner (Larson, 1987; Zhou and Soman, 2008). In this case the cause of perceived injustice is easily attributable to the store (Zhou and Soman, 2008). Sometimes, different priority rules, such as express checkouts, are applied to target different customer categories. If customers do not spend approximately equal amounts of time waiting, this may also create perceptions of injustice (Rafaeli et al., 2002; Zhou and Soman, 2008). Based on the aforementioned scenarios, we hypothesize that:

**H7.** Perceived social injustice positively influences the perceived duration of the wait.

2.8 Value

The more valuable a service, the longer a customer is willing to wait (Jones and Peppiatt, 1996; Maister, 1985). If customers have a shopping cart full of groceries, they are more likely to be tolerant than when they are waiting to pay for only a few items. Verbeke et al. (1996) also consider the total monetary purchase amount per shopping trip an important factor in determining customers’ reactions to out-of-stock situations in a grocery store. The lower the perceived value of the service for which one stands in line, the more aggravating the wait is perceived to be. The following hypothesis is formulated:

**H8.** The value of the purchase directly and negatively influences the perceived duration of the wait.

3. Methods

3.1 Design of the field study

To empirically validate the theoretically developed model, a natural field setting was chosen. This approach has the advantage that it offers sufficient variance across the factors that are
needed to test the model: in the supermarkets under consideration, we routinely see lines of various lengths, due to various causes and in changing settings (Taylor, 1994). To minimize carry-over effects from experiences during prior shopping-trips and during trips to other supermarkets, we chose to ask customers to respond to a questionnaire about their evaluations and perceptions immediately following their service experience.

3.2 Sampling

Questionnaires were distributed to customers at various supermarkets over a two-week period in December 2006, during busy hours with relatively long lines: 11:00 – 13:00 and 16:00 – 18:00. By sampling customers from different supermarket chains (Edah, C1000 and Albert Heijn) at various locations in the Netherlands, we increased the variance in the data and obtained greater generalizability of the results (Clemes et al., 2000). Dutch shoppers are not particularly polite, when waiting in line, but behave generally in a civil manner (Rafaeli and Sutton, 1990).

Respondents were told that the study investigated the relationship between shopping experiences and customer satisfaction. Customers were explicitly instructed to respond regarding their most recent shopping experience. Fifty completed questionnaires were obtained from customers at each chain. This so-called ‘complete-case-approach’, excluding questionnaires with obvious missing values (Hair et al., 1998) resulted in a total sample of 150 cases.

Although the three stores studied all have a large assortment of products and services, sell many brands, and have relatively large sales volumes, the three selected chains vary substantially in terms of store design, quality and assortment of merchandise, image, pricing and promotion strategies. Table 1 compares the stores.
The sample is described in Table 2. Seventy percent of the respondents were women\(^1\). More than half of the respondents were between 25 and 55 years of age. Forty percent of the respondents reported that they go grocery shopping two to three times a week.

[PLEASE INSERT TABLES 1 & 2 ABOUT HERE]

### 3.3 Questionnaire design

A questionnaire containing topically organized, structured and disguised statements (i.e. not revealing the purpose of the study, see Judd *et al.*, 1991) was used to measure the constructs. Multiple-item scales were constructed to increase validity and reliability (Peter, 1979). Respondents were asked to indicate the extent to which they agreed or disagreed with 41 statements. Seven-point Likert-type scales were anchored by ‘strongly disagree’ (1) and ‘strongly agree’ (7) with the midpoint labeled ‘neutral’. Table A-1, in the appendix, provides an overview of all items used in the survey.

We had to use a single source to measure both the independent and the dependent variables. To control for common method variance (CMV) bias, a range of procedures was followed. First, our items were formulated as clear, concise and specific as possible, mostly based on previously validated scales. A pre-test was conducted among 19 customers to identify and eliminate any overly complex or ambiguous items. We identified some issues regarding the wording of the items. We made some slight changes to the questionnaire based on the comments, and some ambiguous questions, leading to substantial cross-loading of items, were deleted from the questionnaire. This approach is known to limit CMV produced by item characteristics (Spector, 1994).

Furthermore, we stressed that no right or wrong answers existed, and that we were looking for answers best describing their specific experience.
3.3.1 Measures

Most items used in our study were adopted from the literature, sometimes slightly modified to suit the retailing context, while a few new items had to be developed specifically for the purpose of this study. Existing scales were borrowed from published studies in the domains of waiting and queuing, store image and customer satisfaction. The questionnaire was constructed in English and then translated into Dutch. Single back-translation was used to assure equivalence of meaning.

Satisfaction consists of a rational and an emotional component (Yu and Dean, 2001). Thus, items corresponding to both dimensions of satisfaction were included in the questionnaire: we used three questions relating to ‘rational satisfaction’ and three questions relating to ‘emotional satisfaction’. The questions were taken from a scale developed by Oliver (1993) and customized for the present study. Based on measures developed and tested by Semeijn et al. (2004) and Wu and Petroshius (1987), nine store image items were included in the questionnaire. Store image was operationalized as a second order formative construct, with three dimensions: service, merchandise and layout. Wait experience was measured with four items, adapted from previous studies to fit the retail waiting environment (Katz et al., 1991; Mehrabian and Russell, 1974; Schmitt et al., 1992). The perceived duration of the wait was measured based on a scale developed by Kellaris and Kent (1992). Wait attribution was measured with items adapted from Taylor (1994) and Folkes et al. (1987), and wait area appearance items were modified from a scale developed by Bitner (1990). Social justice was measured based on research by Larson (1987) and by Zhou and Soman (2008).

3.4 Analysis

3.4.1 Descriptive statistics

The data were first investigated on a descriptive level. Before conducting any other analyses, we screened for missing values. Despite the complete case approach, some values were
missing in our data, but they were missing in less than 2% of cases. To maintain an acceptable sample size, and only in cases where this had little consequence (i.e., when only one or two observations of randomly distributed items were missing), we substituted missing values with the means (Hair et al., 1998). This approach is known to produce a minimal change in correlation coefficients and no change in the regression coefficients (McKnight et al., 2007). Furthermore, the distributions of all variables were checked for normality, and no extreme cases were found. Customer satisfaction is somewhat skewed to the right as participants in the study were relatively satisfied with the shopping experience. This finding is in line with Fornell (1992), who argues that in more homogenous industries with less opportunity for differentiation (such as non-durable goods which included the categories basic and other foods) overall customer satisfaction scores are relatively high.

Harman’s one factor test was used to test for a bias caused by common method variance (CMV). In this test, all items are subject to an exploratory factor analysis (EFA). CMV exists if (1) a single factor emerges from the unrotated factor solution, or (2) a first factor explains the majority of the variance in the variables (Podsakoff and Organ, 1986). When we conducted a principal component factor analysis of all items used in this study, we identified 11 factors with Eigenvalues higher than 1.0. Moreover, the largest Eigenvalue accounted for less than 25% of the total variance, well below the rule-of-thumb cut-off value (cf. Podsakoff and Organ, 1986). This finding indicates that the measures we took to reduce CMV were successful, and that CMV bias is not a serious problem in the data.

Exploratory (EFA) and confirmatory factor analyses (CFA) were performed on all items, since measurement instruments from different studies were combined. An exploratory factor analysis, using maximum likelihood (Fabrigar et al., 1999) and direct oblique rotation, to avoid loss of valuable information, and to obtain a reproducible solution (Costello and Osborne, 2005) was used to verify if the items and sometimes rephrased wordings
successfully reflect the same factors as intended in the original articles (see for example Thompson, 2007). Through these analyses, a few items that exhibited low communality (<.40), high levels of cross-loadings (i.e. loaded on more than one component with values > .30, a value that is commonly used in the literature) or did not load highly (> .70) on the expected factors were excluded from the analysis, while maintaining at least three strong (> .50) loading items per factor (Costello and Osborne, 2005). The purification of the scale was done focusing on face validity of the factors (Preacher and MacCallum, 2003). A list of the retained items after CFA in SmartPLS (Ringle et al., 2005), their means and standard deviations, as well as factor loadings and t-values for the total sample are presented in Table AI in the Appendix. As can be seen from this table, all remaining items load highly (>0.60) and significantly on their respective constructs, while composite reliability measures, and Cronbach’s Alpha exceed 0.60 for each construct (Nunnally and Bernstein, 1994), warranting convergent validity of the factors.

Significant differences in the means among stores, obtained using one-way ANOVA, are reported in Table 3. The results of a Chow test (Thomas, 1997), a special F-test, which tests for regression parameter stability over various subsamples, suggested that pooling of the data from the three supermarkets was permissible. Table 3 shows that customers at the three supermarkets had significantly different perceptions for only three of the 9 factors; First, the extent to which customers perceived their time at the checkout to be engaging (distraction) was quite low in general (mean = 2.58). In this dimension, Albert Heijn scored significantly (p = .034) lower than the other two stores. Second, customers seemed quite satisfied with the level of social justice they experienced while waiting (mean = 4.62). Customers at Albert Heijn perceived the highest level of social justice, while customers at C1000 ranked the lowest for this metric (p = .090). Finally, we identified significant (p = .024) differences in the
perceptions of how organized and tidy the waiting area was. C1000 customers appeared to be most satisfied with the appearance of the waiting area.

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Insert Table 3 about here

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Fornell and Larcker (1981) suggest that the average variance shared between a construct and its measures should be greater than the variance shared between that construct and other constructs in the model. Discriminant validity is therefore considered sufficient if the square root of the average variance extracted (AVE) for a given factor is greater than the correlations between this factor and any of the other factors (square root of the AVE appears on the diagonal of Table 4). Overall, our measures show excellent reliability and validity values. In Table 4, correlations between factors are reported.

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Insert Table 4 about here

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Significant correlations exist between dependent and independent variables. All of the hypothesized relationships show moderate to strong correlations (> .50).

3.5 PLS regression

The hypotheses were tested by simultaneously estimating the proposed structural equations using a Partial Least Squares (PLS) approach (Chin, 1998). PLS path modeling, a prediction-oriented, variance-based approach, was used to simultaneously estimate all relationships in the conceptual model. The objective of PLS is to maximize the amount of explained variance in the dependent variable(s) (Henseler et al., 2009; Streukens et al., 2010). There are various reasons to select the PLS methodology. First, our sample was not homogeneous because it consisted of three sub-samples from different supermarket chains. Whereas Maximum Likelihood estimations, using Lisrel or Amos, are very sensitive to violations of multivariate normality (Shah and Meyer Goldstein, 2006), PLS is known to be robust in the case of non-normality as a result of heterogeneity among groups of observations (Streukens et al., 2010).
PLS can derive estimates for factor loadings that are often overestimated, while path coefficients may be underestimated (Hsu et al., 2006). These negative effects may be balanced by increasing the sample size and the number of indicators per construct (Chin and Newsted, 1999). Given the exploratory nature of the present research and our emphasis on theory development, PLS was particularly useful given its prediction-oriented nature (Barclay et al., 1995; Fornell and Cha, 1994).

Another advantage of PLS is that we can run the analyses with relatively small sample sizes and complex models (Cassel et al., 2000), since the assumption of normality is not necessary (Chin, 1998). The accepted rule of thumb regarding the required sample size of PLS is consistent with requirements for multiple regressions (Barclay et al., 1995). Generally, the ratio between the number of observations and the number of independent variables needs to be within the range of 5 to 30 (Guadagnoli and Velicer, 1988). In our model, we have 8 independent variables and our sample consists of 150 observations. Thus, the ratio is 19, which is well within the recommended range.

Figure 2 shows the empirically validated model. It appears that all the hypothesized relationships are confirmed. Wait experience, store layout and merchandise were found to directly influence customer satisfaction.

3.6 Structural model testing

Standardized PLS path coefficients, as well as the corresponding t-values and R-square metrics for each explained variable, are shown in Figure 2. Only significant effects are shown in the figure. Following Liljander et al. (2009), to assess both the measurement model and the structural model, we calculated the overall goodness-of-fit (GOF) as suggested by Amato et al. (2004) and Streukens et al. (2010):

\[
GOF = \sqrt{\text{communality} \times R^2}
\]

(1)
\( \bar{R}^2 \) represents the average of all R\(^2\) values found in the empirically validated model.

\[
\text{communality} = \frac{1}{p} \sum_{j=1}^{l} p_j \cdot \text{communality}_j
\]  

(2)

Formula (2) calculates the term \( \text{communality} \). \( \text{communality}_j \) provides an indication of the quality of construct \( j \)'s representation in the final factor solution and equals the AVE for construct \( j \). Coefficient \( p_j \) equals the number of items used for measuring construct \( j \), \( p \) represents the total number of items. The GOF value for the present model is .45, which is of the same order of magnitude as the .48 for the European Consumer Satisfaction Index (ECSI) model reported by Tenenhaus et al. (2005).

4. Results

As expected, a strong positive relationship was found between store image and satisfaction (\( \beta = .534, t = 9.637 \)). Wait experience also directly and strongly influences satisfaction (\( \beta = .36329, t = 5.999 \)): the less the customers disliked their time in line, or the more they enjoyed it, the higher their level of satisfaction with the overall shopping experience. The amount of explained variance in overall satisfaction increased by 24% when we included wait experience in the model, increasing \( r^2 \) from .46 to .57. Furthermore, store image was hypothesized to mediate the effect of the wait experience on overall satisfaction. The mediation effect was tested in two steps. To decide about the status of the mediation, partial or full we used a method advocated by Shrout and Bolger (2002): it was investigated whether there was a significant direct effect of wait experience - the independent variable (IV) - on overall satisfaction - the dependent variable (DV) - without including the mediating variable (MV) store image. This effect was highly significant. Then store image was included. All effects (IV \( \rightarrow \) MV, MV \( \rightarrow \) DV, and IV \( \rightarrow \) DV) were significant. This observation points at partial mediation. To confirm the mediation effect, its significance was calculated by bootstrapping the product of the IV\( \rightarrow \)MV and MV\( \rightarrow \)DV effects as suggested by Efron and
Tibshirani (1993). All effects were found to be significant, and the mediation was concluded to be partial.

In the following subsections, we present the empirically validated antecedents of the wait experience metric and our findings for each.

4.1 Perceived duration of the wait

Perceived duration of the wait appears to have a strong effect on wait experience ($\beta = -.360, t = 5.473$). The longer customers perceive a wait to last, the worse their wait experience, and the lower their satisfaction. Our study shows that the length of the wait, as perceived by the customer, has an important indirect effect on customer satisfaction.

4.2 Wait attribution

Wait attribution seems to strongly influence wait experience ($\beta = -.391, t = 8.149$). The more the service provider is perceived as having control over the duration of the wait, the more unpleasant customers find their wait experience.

4.3 Distraction

Distraction appears to have a significant effect on wait experience ($\beta = .218, t = 3.426$). When customers perceive their time as engaging or purposeful, evaluations of the wait experience are higher, consistent with previous findings. According to the ‘resource-allocation theory’ (Zakay, 1989), distractions will divert people’s attention from the wait, resulting in less boredom and frustration.

4.4 Social justice

It appears that social justice is indeed a very important antecedent of perceived duration of the wait ($\beta = -.484, t = 7.218$). Greater social justice makes the wait appear shorter. This finding is in line with predictions by Larson (1987) and Sasser et al. (1979), based on anecdotal evidence from airport and restaurant studies.
4.5 Perceived value

The perceived value of the products in the shopping cart showed a significant, direct and negative effect on perceived duration of the wait ($\beta = -.199$, $t = 3.915$). In other words, customers perceive waits longer when they have fewer items in their basket. Since waiting is generally disliked, this may indicate that, everything else held constant, wait experience decreases with the number of items in the basket.

4.6 Waiting area

Indirect effects on wait experience were found for the state of the waiting area, via wait attribution ($\beta = -.248$, $t = 3.994$), and for the perceived duration of the wait, via social justice ($\beta = .241$, $t = 3.960$). A tidy, well-organized waiting environment reduces the extent to which customers attribute the cause of the wait to the store, and increases perceptions of social justice. This finding suggests simple ways in which store management can make a waiting period more bearable for their customers.

5. Conclusions

The objective of the study was to investigate the role of satisfaction with the wait at the checkout in determining overall satisfaction, and to develop a better understanding of its antecedents. In our study, wait experience as well as store image appear to exert a strong positive effect on overall satisfaction. Wait experience plays a role that is complementary to other evaluation dimensions, while also affecting the perceived store image, and directly influences overall satisfaction with a store. This implies that productively managing the wait can have a substantial effect on the bottom line, since satisfied customers are generally more loyal and therefore more profitable.

From the significant mediation effect of store image it can be deducted, that positive evaluations of interactions with a service provider prior to a wait can be mitigated when the wait experience is perceived negatively. However, as we have seen in the present study, waits
do not necessarily have a negative impact on service evaluations. From our study it becomes clear that the final service encounter experience affects overall satisfaction in ways that depend on how the wait is managed (Katz et al., 1991; Rafaeli et al., 2002). A well managed, attractive and equitably perceived waiting environment, that provides sufficient distraction to the waiting customer, will positively contribute to overall satisfaction.

5.1 Theoretical implications

We have demonstrated the important and complementary role of the behavioral construct of ‘wait experience’ in explaining overall customer satisfaction. An investigation of customer satisfaction with a store without taking into account the various waits appears incomplete. Wait attribution and perceived duration of the wait appear to be the most important antecedents of the wait experience. The effects of wait attribution and distraction in this study were found to be similar to those found in prior studies investigating lines and delays in very different settings. To complete the model suggested by Taylor (1994, 1995), we also included the factors value of service, appearance of the waiting area, and social justice.

5.2 Managerial implications and recommendations

Customer experiences at the checkout have a significant effect on evaluations of service and subsequent satisfaction levels. Successfully managing service operations surrounding the checkout, by making use of insights from services marketing, can provide businesses with a substantial advantage (Ellinger et al., 2006). Our results suggest a direct and strongly positive relationship between the wait experience and overall satisfaction. Waits therefore require a proactive management approach, to prevent or minimize any negative impacts on overall satisfaction.

A major implication of this study is that managing waits is not limited to reducing the actual wait times. Instead, perception management strategies, aimed at reducing the perceived duration and attribution of responsibility for the wait to the store, can reduce the negative
impact of waits on satisfaction. Certainly, opening more checkout counters at peak operating hours, implementing training programs to increase checkout speeds and using faster scanning technologies will all reduce actual waiting times. However, space constraints, fluctuating customer volumes and the difficulty in predicting demand for services, together with associated cost constraints, limit the potential results of these strategies. Therefore, making the wait appear shorter by means of ‘perception management’ may be an attractive and less costly alternative. Our study shows that a variety of different perceptions should be managed to achieve the intended result of increasing overall satisfaction, however, more research is needed to address these in specific. In the following, we provide general suggestions that need to be further investigated to determine the outcomes on the wait experience, in specific, and the overall customer satisfaction.

5.2.1 Make the waiting area appear attractive and well-organized

Tidiness indirectly influences the wait experience. Customers who have second thoughts about their product selections often leave behind bruised fruits, or other undesired products, in the area around the checkout counter. When customers perceive slow service, they may also attribute it to the store, as the appearance of the waiting area reflects the extent to which store management cares about its customers. Future research can investigate the effect of different layouts and set-ups to determine which aspects are most appropriate in the supermarket check-out line to reduce perceived waiting time.

5.2.2 Offer customers engagement opportunities

Perceived ‘idle time’ while standing in line was found to negatively affect the wait experience. Offering customers engagement opportunities, so that they stop thinking about the wait itself, can increase satisfaction levels and reduce the perceived duration of the wait (Tom and Lucey, 1995). Placing video displays, interactive information screens, mirrors, magazines (Haynes, 1990) or free, relevant literature (such as nutritional information flyers and leaflets
with next week’s promotions) next to the checkout lines can help both distract and entertain customers. Different fillers can have different effects on waiting customers (Munichor and Rafaeli, 2007). Therefore, additional research is needed to determine the optimal balance between engaging customer and annoying the customer.

5.2.3 Promote social justice

Although in our study the role of ‘social justice perceptions’ seems moderate, other authors attach significant value to this issue (Maister, 1985). We therefore recommend taking perceived justice seriously in the design of the service system and not giving priority to customers who, according to generally accepted equity rules, are not ‘supposed’ to be treated in an advantageous or faster way. Maister (1985, p. 121) recommends that, whenever priority rules are used, “the service provider must make serious efforts to ensure that these rules match with the customer’s sense of equity.” According to Zhou and Somon (2008), equity in total waiting time should also be a concern to operations managers.

5.2.4 Express lanes and self-service checkouts

Opening up express lanes, possibly with self-service checkout scanners, can be a good strategy for addressing the impact of product value on perceived duration of the wait. Customers who buy only a few items exhibit less tolerance for waiting in line. Bennett (1998) found that express lanes as such are not perceived as unfair. When express lane cashiers serve customers with too many products, however, the other customers in the express lane may become dissatisfied.

5.3 Limitations and suggestions for further research

The present study furthers our understanding of the relationships between sentiments regarding the wait time at checkout, wait experience, store image, and overall satisfaction. The theory should be further refined. It currently fits one specific type of waiting. Generalizing the results to other waiting situations and settings should therefore be done with
caution. The results are likely transferable to other short-wait situations, such as at banks and other retail outlets, but they may not generalize to the long-wait environments encountered in airports or hospitals. To improve reliability, future research should use larger samples, while attention should be paid to the development of measurement scales specifically for the various dimensions of the retail experience. Future investigations of the differences between wait-perceptions across a variety of supermarket formulas, but also across in-store specialty departments – e.g. fresh fish and meat, bakery, deli – and their relationship to the wait could lead to further insights. We did not consider the role of the cashier in the study, whilst interactions between the cashier and customers could also be considered responsible for part of the wait experience. Some encounters give rise to strong negative emotions in customers. In future research explicit attention must therefore also be paid to the role of the cashier, for example to the emotional competences of this contact employee.

In our sample, males and females were not equally well represented. In the population of supermarket visitors this is neither the case, so we believe that the sample is representative for this population. The unequal distribution may, however, have consequences for generalizability to other domains.

Several recommendations are made in this article on how to manage customers’ wait perceptions. Investigations of how these perception strategies can best be implemented seem to be a logical next step: should stores ‘fill time’ by installing TV screens, or should they instead engage customers with free samples and flyers? Should the strategies differ between supermarket formulas, or by customer segment?

Next to the advantage of making observations in a real life situation, field research certainly has its limitations as a result of the difficulty to control for unobserved factors, and the complexity of the observed reality. To develop an in-depth understanding of customers’ wait experiences in supermarkets, and to differentiate between waiting in different parts of the
store (fresh fish, bread, dairy, deli, checkout), more, possibly qualitative, research would be required. In addition, the short and specific data collection period may further limit the generalizability of our findings. Customers might be less patient during the pre-Christmas shopping season than at other times. Experimental designs could also be used to investigate the effects we found in more detail, and to better isolate the causes of the effects we found. Customer experiences with waiting at self-service technologies that substitute interactions with store personnel could also be an interesting area of research.

Finally, do cultural and social differences lead to differences in wait experience? This question is especially relevant for supermarket chains with locations across the globe.
References


Figure 1 Research model
Figure 2 Empirically validated model
<table>
<thead>
<tr>
<th></th>
<th>Albert Heijn</th>
<th>Edah</th>
<th>C1000</th>
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<tbody>
<tr>
<td><strong>Store type</strong></td>
<td>Neighborhood store</td>
<td>Supermarket</td>
<td>Supermarket</td>
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<tr>
<td><strong>Number of employees</strong></td>
<td>80</td>
<td>45</td>
<td>150</td>
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<tr>
<td><strong>Store area (m²)</strong></td>
<td>1100</td>
<td>1148</td>
<td>800</td>
</tr>
<tr>
<td><strong>Number of products in stock</strong></td>
<td>8000</td>
<td>9500</td>
<td>7000</td>
</tr>
<tr>
<td><strong>Number of checkout aisles</strong></td>
<td>7</td>
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<td>7</td>
</tr>
<tr>
<td><strong>Store-owned parking lot</strong></td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Length of checkout belt (number of shoppers unloading carts simultaneously)</strong></td>
<td>1 - 2</td>
<td>3 - 4</td>
<td>2</td>
</tr>
<tr>
<td><strong>On the left of checkout</strong></td>
<td>Drinks + candy</td>
<td>Cigarettes</td>
<td>Cigarettes (3 rows)</td>
</tr>
<tr>
<td><strong>On the right of checkout</strong></td>
<td>Magazines + videos</td>
<td>Cigarettes + plastic bags</td>
<td>Trash bags + candy (3 rows)</td>
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<tr>
<td><strong>Distance from aisles to start of checkout belt (in meters)</strong></td>
<td>3</td>
<td>3.5</td>
<td>2.5</td>
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*Table 1:* Key characteristics of the three grocery stores.
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<th>Gender</th>
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<th>%</th>
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<td>&lt; 1</td>
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<td>1</td>
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<td>40</td>
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<td>&lt; 25</td>
<td>32</td>
<td>21.3</td>
<td>&gt; 3</td>
<td>22</td>
<td>14.7</td>
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<td>31.3</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>41 - 55</td>
<td>44</td>
<td>29.3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; 55</td>
<td>27</td>
<td>18</td>
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<td>Store visits per week</td>
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<td></td>
<td>Purchase amount (€)</td>
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<tr>
<td>&lt; 1</td>
<td>4</td>
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<td>&lt; 10</td>
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<td>8</td>
</tr>
<tr>
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<td>24</td>
<td>16</td>
<td>10 - 25</td>
<td>52</td>
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<td>2 - 3</td>
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<td>50</td>
<td>26 - 50</td>
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<td>&gt; 3</td>
<td>47</td>
<td>31.3</td>
<td>&gt; 50</td>
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<td>21.3</td>
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*Table 2: Sample demographics*
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<th>Sample mean</th>
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<th>C1000 mean</th>
<th>AH mean</th>
<th>F</th>
<th>Sign.</th>
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<td>4.23</td>
<td>4.10</td>
<td>4.48</td>
<td>4.12</td>
<td>0.537</td>
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<td>4.59</td>
<td>0.660</td>
<td>0.518</td>
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<td>Merchandise</td>
<td>4.07</td>
<td>3.89</td>
<td>4.18</td>
<td>4.15</td>
<td>0.632</td>
<td>0.533</td>
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<td>Wait experience</td>
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<td>3.69</td>
<td>3.87</td>
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<td>Perceived duration of the wait</td>
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<td>Wait attribution</td>
<td>2.62</td>
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<td>Distraction</td>
<td>2.58</td>
<td>2.57</td>
<td>2.95</td>
<td>2.21</td>
<td>3.449</td>
<td>0.034**</td>
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<td>Social justice</td>
<td>4.62</td>
<td>4.52</td>
<td>4.35</td>
<td>4.98</td>
<td>2.440</td>
<td>0.090*</td>
</tr>
<tr>
<td>Value</td>
<td>3.40</td>
<td>3.40</td>
<td>3.50</td>
<td>3.30</td>
<td>0.551</td>
<td>0.577</td>
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<tr>
<td>Waiting area</td>
<td>4.18</td>
<td>3.75</td>
<td>4.59</td>
<td>4.21</td>
<td>3.847</td>
<td>0.024**</td>
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*Table 3: Means of all factors for different supermarket formulas*

* = significant at 0.10 level; ** = significant at 0.05 level;
<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
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<th>(9)</th>
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<td>Wait attribution (1)</td>
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<td>-.178*</td>
<td>.823</td>
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<td>Store layout (3)</td>
<td>-.297**</td>
<td>.308**</td>
<td>.777</td>
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<td>Merchandise (4)</td>
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<td>.212*</td>
<td>.577**</td>
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<td>Value (5)</td>
<td>-.075</td>
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<td>.335**</td>
<td>.377**</td>
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<td>Overall satisfaction (6)</td>
<td>-.423**</td>
<td>.331**</td>
<td>.679**</td>
<td>.565**</td>
<td>.399**</td>
<td>.813</td>
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<tr>
<td>Store personnel (7)</td>
<td>-.190*</td>
<td>.185*</td>
<td>.528**</td>
<td>.538**</td>
<td>.369**</td>
<td>.473**</td>
<td>.848</td>
<td></td>
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<td>Social justice (8)</td>
<td>-.693**</td>
<td>.170</td>
<td>.239*</td>
<td>.233*</td>
<td>.971</td>
<td>.238**</td>
<td>.238**</td>
<td>.871</td>
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<tr>
<td>Perc. wait duration (9)</td>
<td>.720**</td>
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<td>Wait experience (10)</td>
<td>-.693**</td>
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<td>.575**</td>
<td>.295**</td>
<td>.576**</td>
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<td>Waiting area (11)</td>
<td>-.247**</td>
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<td>.403**</td>
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<td>.301**</td>
<td>.380**</td>
<td>.414**</td>
<td>.242**</td>
<td>-.316**</td>
<td>-.349**</td>
<td>.950</td>
</tr>
</tbody>
</table>

Table 4: Correlation coefficients between all factors in the model

* = significant at .05 level; ** = significant at .01 level. Square root of AVE on the diagonal.
Construct / Measures | Loading | t-value | Mean | Std. dev
---|---|---|---|---
**Overall satisfaction** ($\alpha = .90; CR = .92$) | | | 4.23 | 1.24
It was a good decision to shop at “...” and not in a different store. | .729 | 19.163 | 4.43 | 1.51
I prefer this “...” when comparing it with other supermarkets. | .785 | 20.069 | 3.89 | 1.66
Today’s shopping experience at “...” today was as expected. | .766 | 23.347 | 4.56 | 1.59
Buying my groceries at this “...” today was a pleasant experience. | .881 | 54.511 | 4.18 | 1.53
I felt good today when shopping at “...”. | .891 | 54.024 | 4.27 | 1.45
I liked shopping at “...” today. | .856 | 39.576 | 4.09 | 1.44
**Store personnel** ($\alpha = .80; CR = .88$) | | | 4.52 | 1.09
The employees of this “...” were friendly today. | .716 | 48.011 | 4.85 | 1.30
The employees of this “...” are knowledgeable. | .918 | 79.635 | 4.53 | 1.26
Employees were willing to find custom solutions to questions. | .895 | 14.078 | 4.17 | 1.28
**Merchandise** ($\alpha = .62; CR = .79$) | | | 4.07 | 1.43
This “...” offers a broad assortment of products. | .647 | 10.091 | 4.03 | 1.84
This “...” sells high-quality products. | .839 | 23.103 | 4.67 | 1.36
Products I needed were available. | .618 | 7.278 | 4.47 | 1.81
**Store layout** ($\alpha = .66; CR = .81$) | | | 4.24 | 1.59
It was easy to find products on offer. | .647 | 7.786 | 4.53 | 1.30
Physical facilities at “...” are visually appealing. | .800 | 21.427 | 3.72 | 1.90
This “...” has a clear store layout. | .868 | 35.353 | 4.47 | 1.57
**Wait experience** ($\alpha = .87; CR = .91$) | | | 3.78 | 1.69
I was relaxed while standing in line (reverse coded). | .726 | 14.606 | 3.87 | 1.90
I felt frustrated while in line today. | .903 | 83.296 | 4.28 | 1.88
I was bored during the wait. | .897 | 73.006 | 3.53 | 2.06
I disliked my time in the queue. | .858 | 38.198 | 3.45 | 2.09
**Perceived duration of the wait** ($\alpha = .85; CR = .91$) | | | 2.47 | 1.75
I had to wait a long time at checkout today. | .929 | 56.954 | 2.70 | 2.13
I thought I would never get out of this line today. | .914 | 68.426 | 1.93 | 1.93
The wait today was shorter than expected (reverse coded). | .782 | 21.934 | 2.78 | 1.93
**Wait attribution** ($\alpha = .86; CR = .92$) | | | 2.75 | 1.59
Wait was longer than necessary due to too few checkout counters. | .894 | 41.725 | 2.37 | 2.21
The store was to blame for my longer than necessary wait. | .923 | 72.953 | 2.17 | 2.20
Employees at the checkout worked slowly. | .842 | 37.476 | 2.83 | 2.10
**Distraction** ($\alpha = .80; CR = .86$) | | | 2.58 | 1.44
While waiting today I felt occupied by things around me. | .819 | 8.184 | 2.47 | 1.77
I felt I was being distracted while waiting. | .750 | 6.440 | 2.26 | 1.62
There were plenty of things to do and look at while I stood in line. | .895 | 24.031 | 3.00 | 1.75
**Social justice** ($\alpha = .84; CR = .90$) | | | 4.62 | 1.50
Feeling that people with few products received beneficial treatment. | .766 | 10.926 | 4.83 | 1.47
Feeling that people who joined the queue later got served before me. | .921 | 53.121 | 4.75 | 1.75
Seemed that service in other queues was faster (reverse coded). | .917 | 49.124 | 4.26 | 1.89
**Value** ($\alpha = .87; CR = .91$) | | | 3.40 | 1.62
The products I just bought are important to me. | .915 | 9.867 | 4.51 | 1.51
I really needed the products I bought. | .919 | 7.557 | 4.67 | 1.61
My shopping cart was entirely filled today. | .542 | 3.072 | 2.15 | 1.88
Feeling I bought a lot of goods today. | .983 | 9.137 | 2.28 | 1.92
**Waiting area** ($\alpha = .90; CR = .91$) | | | 4.18 | 1.55
Perceived the waiting area as neat. | .944 | 35.129 | 4.37 | 1.54
Found the waiting area organized. | .956 | 18.214 | 3.99 | 1.72

Table A-1. Items and confirmatory factor analysis for constructs

---

1. We did not measure a significant difference between genders in variables related to the perception of the waiting area, degree of filled time and value or amount of products purchased. We do find significant differences in
perceived wait duration and wait experience. We find that men in our sample are more satisfied and tolerant towards waiting than women.

Although, from a methodological point of view it would be interesting to also include deleted items, this would make the table very long. The researchers are happy to share all information about the data with interested researchers.