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# WORKING PAPER

# The waiting experience and consumer perception of service quality in outpatient clinics

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# The waiting experience and consumer perception of service quality in outpatient clinics

**Abstract**

This is the first field study examining the link between waiting and various dimensions of service quality in outpatient clinics. We investigated pre-process waiting in 9 outpatient clinics in a single hospital to test the effect of selected waiting experience variables on the evaluation of service quality, with objective and subjective waiting times as covariates in the relationship between the variables of the waiting experience and participants' perceptions of service quality, measured using the Servqual tool.

Our results show that the waiting-related variables that we studied have more impact on tangibles (the physical attributes) and reliability than on the other service quality dimensions of Servqual. Providing information about the reasons for delay had a significant main effect on the perception of reliability and significant interaction effects with the outpatient clinic itself and with the extent to which consumers' time was filled while waiting on the perception of the tangibles. The study contains several findings that should assist service managers to formulate more effective waiting perception strategies.

Keywords: healthcare operations, waiting experience, quality management

## Introduction

In times of increased competition in health care, the speed of service delivery can provide a significant competitive advantage (Davis and Heineke, 1994). Customers are confronted with waiting for a variety of services in hospitals. Barlow (2002) found that one of the hardest waiting experiences is that which occurs in a hospital's outpatient clinic for a prearranged appointment. Kostecki (1996) calls this the appointment syndrome: when the appointment time is passed, even a short wait is annoying. Waiting is often a negative experience because of its economic and psychological costs (Kumar et al., 1997), and delay is worse when customers have high expectations about the service quality (McDougall and Levesque, 1999). The amount of time that consumers spend waiting, and their discomfort in waiting long periods before being seen by a doctor, can significantly influence their satisfaction with (Raminez Valdivia and Crowe, 1997), and evaluation of the service (Taylor, 1994).

The scientific aim of this research is to investigate what the impact of waiting experience variables is on service quality and if this impact can be generalized for different outpatient clinic environments. The managerial purpose is to help managers of outpatient clinics to manage the waiting experience to achieve better service quality. First, we develop a framework for variables related to the waiting experience, which enables comparison with previous studies concerning different types of waiting. Second, we provide a brief overview of the existing research on waiting and the effect of waiting on service quality. This leads to the development of our research questions in the third section. Fourth, we describe our empirical study and present the results on waiting in outpatient clinical settings. Finally, we discuss the results of the empirical study and discuss their implications for future research and management.

## 1. Framework for variables concerning the waiting experience

### *1.1. Types of waiting in service delivery*

Consumers are confronted with a sequence of events in service delivery. They may wait before, during, or after a transaction—that is, they may experience *pre-process, in-process* or *post-process waiting* (Dubé-Rioux et al., 1989; Dubé et al., 1991). Pre-process waiting occurs before the service delivery—for example, waiting before seeing the doctor in an outpatient clinic. This waiting can be due to a consumer's arriving early (*pre-schedule waiting*), a doctor's starting the consultation late (*post-schedule waiting* or *delay*) or *queue waiting* (when all consumers are queued without prearranged appointments) (Taylor, 1994). In-process waiting occurs during a service delivery itself, after a consumer has entered the consultation room—for example, while the doctor receives a phone call or performs administrative tasks not related to the consumer who is waiting. Post-process waiting occurs after a service is delivered—for example, when a consumer must wait to pay the bill (see Figure 1). Previous research has revealed that pre- and post-process waiting generates more intense negative affective responses than

in-process waiting (Davis and Maggard, 1990; Dubé-Rioux et al., 1989; Dubé et al., 1991). Our empirical study in outpatient clinics was limited to pre-process waiting.

INSERT FIGURE 1 ABOUT HERE

*1.2.Subjective interpretation of waiting*

For each type of waiting described above, there is an established subjective interpretation on the part of the consumer (see Figure 2). We define this subjective interpretation as how a consumer views a waiting experience as a whole. The subjective interpretation of waiting results from a combination of (1) the objective duration, or clock time, of the wait, (2) the consumer's perceived duration of the wait, and (3) the situational contexts of the wait. This subjective interpretation of waiting gives rise to a level of satisfaction or dissatisfaction on the part of the consumer.

In the present study, the objective waiting time was measured from the consumer's arrival at the outpatient clinic until he or she was called in for consultation. This was entirely pre-process waiting time and comprised both pre-schedule and post-schedule waiting. This contrasts with several studies (e.g., Taylor, 1994) that consider only post-schedule waiting time when referring to objective waiting time.

The situational factors of waiting are the service design characteristics and the consumer's individual characteristics. Particular waiting situations vary in the control that the service provider exercises over the service design and the control that individuals exercise over their own characteristics (e.g., Beqiri and Tadisina, 2002; Durrande-Moreau, 1999; Jones and Peppiatt, 1996). The situational factors influence individual consumers' subjective interpretation of waiting and determine their expected and acceptable waiting times (see Figure 2).

Service design characteristics can influence four of the eight propositions of Maister's (1985) psychology of waiting lines (Davis and Heineke, 1998): pre-process vs. in-process waiting, uncertain vs. known waiting, unexplained vs. explained waiting, and unfair vs. equitable waiting. Other service design characteristics that may influence the waiting experience are e.g. the physical discomfort of waiting (Davis and Heineke, 1994), the actions of the service provider (Sarel and Marmorstein, 1998) and the physical environment in the waiting room such as colors and visual stimulation (Gelinas-Chebat and Filiatrault, 1993). An understanding of how these factors can contribute to satisfaction/dissatisfaction with waiting may lead to better management of those aspects of waiting that *are* possible to control (Beqiri and Tadisina, 2002). The service provider cannot control factors that are primarily customer-related. Individual characteristics consist of e.g. the perceived value of the service to the consumer (Maister, 1985; Taylor and Fullerton, 2000), mood before the wait (Durrande-Moreau, 1999), the value of the consumer's time (Kostecki, 1996), and sociodemographic characteristics such as gender, age and income (Beqiri and Tadisina, 2002). Another three of the eight propositions of

Maister's psychology of waiting lines (1985) can be considered to be potentially controllable by both the service provider and the customer: unoccupied vs. occupied waiting, anxious vs. calm waiting and solo vs. group waiting. Factors such as the weather can be controlled by neither service provider nor the consumer, but do influence the consumer's subjective interpretation of the waiting.

*Expected waiting time* is not only a personal expectation (Durrande-Moreau, 1999) based on individual factors linked to duration, but also incorporates the effect of service design and individual characteristics. We define *acceptable waiting time* as the maximum number of minutes tolerated by a consumer in a specific situation of waiting for the minimum level of service expected (Pruyn and Smidts, 1998).

The perceived duration of the waiting time is how individuals perceive and feel about the time waited before the service was delivered (Baker and Cameron, 1996). This can be expressed in terms of minutes or as 'long' vs. 'short' duration (Durrande-Moreau, 1999) and is influenced by situational and individual factors as well as expected and acceptable waiting time and objective waiting time.

INSERT FIGURE 2 ABOUT HERE

The subjective perception of the waiting experience is influenced not only by the objective waiting time but also by situational factors (which may be controlled by the service provider, by the customer, by both or by neither), expected and acceptable waiting times, and the perceived duration of the waiting. This subjective interpretation results in a level of satisfaction or dissatisfaction with the waiting situation.

**2. Service Quality**

Service quality is an overall judgment similar to 'attitude towards the service' and is related in a more general way to consumer satisfaction, but is not equivalent to it (Parasuraman et al., 1988). The study of Parasuraman et al. (1988) developed Servqual, a multiple-item scale to measure service quality in five service quality dimensions that are sufficiently generic to cover a variety of services in different sectors. Initially, Parasuraman et al. (1985) defined 10 service quality dimensions, which they reduced in subsequent studies to five: reliability (the ability to perform the promised service reliably and accurately), assurance (the knowledge and courtesy of employees and their ability to inspire trust and confidence in consumers), tangibles (the physical facilities, the equipment and the appearance of personnel), empathy (the extent to which caring, individualized attention was provided to consumers) and responsiveness (willingness to help consumers and provide prompt service) (Parasuraman et al., 1988). At first, service quality was measured as the difference between the consumers' perceptions and expectations of the service, quoted on 22 statements that represented the Servqual dimensions (Parasuraman et al., 1985). However, Patterson and Johnson (1993) state that service quality is neither directly nor indirectly influenced by expectations. Perception alone appears to be a strong predictor of

service quality (Cronin and Taylor, 1992; Oliver, 1993; Parasuraman, 1995; Teas, 1993; Woodruff et al., 1983). Parasuraman (1995) argues that the perception-only approach to measuring quality is even more acceptable from a predictive validity point of view, as it explains considerable variance in overall service quality ratings. Moreover, it is regarded as impractical to ask participants to complete two surveys. Since its development, Servqual has been used in several health care settings (Jun et al., 1998; Parasuraman et al., 1994a, Parasuraman et al., 1994b).

## 3. Waiting and service quality

The study of consumers' reactions while waiting for service (e.g., Baker & Cameron, 1996; Davis & Heineke, 1994; McDouglas & Levesque, 1999) has now become a major field of research. It is necessary to understand the variables that influence the perception of waiting time and the potential impact on service evaluations (Beqiri and Tadisina, 2002; Taylor, 1994). Previous research defined service evaluations as consumer satisfaction (Katz et al., 1991; Davis and Heineke, 1998; Pruyn and Smidts, 1998), service quality (Houston et al., 1998) and five service quality dimensions (Chebat et al., 1995). For an overview of all studies relating waiting to service evaluations from 1983 to 1998, see Taylor and Fullerton (2000). Table 1 provides an overview of all studies from 1998 to the present. Pre-process post-scheduled waiting—that is, delay—is significantly more difficult to manage than queue waiting (Taylor, 1994). Therefore, our empirical study was limited to pre-process waiting with appointments, and we limit this overview to studies that relate waiting and service evaluations in a research setting with an appointment system.

### *3.1. Consumer satisfaction*

McKinnon et al. (1998) found that satisfaction levels in health care situations were related to the length of consultation. Pruyn and Smidts (1998) found that the appraisal of waiting in outpatient clinics is a stronger determinant of service satisfaction than the objective waiting time. Three intermediary processes determined the impact of objective waiting time on satisfaction: disparity between perceived waiting time and objective time, the transformation of perceived waiting time into a long/short judgment, and the evaluation of any difference between perceived and acceptable waiting time.

### *3.2. Overall service evaluation*

Taylor (1994) found that longer delays in the airline business resulted in lower overall service evaluation. 'Overall service evaluations were affected directly by evaluations of punctuality and the uncertainty and anger created by the delay. Anger and uncertainty were affected directly by the length of the delay and degree to which time was filled during the delay. Anger also was related to the degree of service provider control over the delay.' (Taylor, 1994, p. 65).

Taylor and Claxton (1994) found that overall service evaluation in the airline sector was rated lower, and the relative importance of punctuality higher, by delayed than by undelayed consumers. Service

attributes experienced prior to boarding were rated lower by delayed than undelayed consumers, but service attributes experienced during the flight were not rated significantly different by delayed than undelayed consumers. Attributes experienced during check-in and boarding, but not directly associated with the service provider, were not rated significantly different by delayed than undelayed consumers.

Hui and Tse (1996) found in an experimental setting that the acceptability of waiting had no significant direct effect on service evaluation, but had an indirect effect through affective response. Information about waiting duration increased the perceived waiting duration but influenced positively the service evaluation through a more positive affective response to the waiting experience.

Brown (1997) found that consumers' attitudes towards a referring doctor, the perceived choice in the selection of the referred provider and the perceived amount of information offered by the referring doctor had at least as much influence as waiting time on the perceived service quality of the referred provider. Houston et al. (1998) found that in the banking sector, the higher the level of negative affect due to waiting, the lower a consumer's evaluation of service quality. The more the consumer had experienced this service provider, the higher the consumer's evaluation of service quality. In her review of empirical research on waiting, Durrande-Moreau (1999) concluded that waiting time has little or no effect on consumers' overall appraisal of the service. Arneill and Devlin (2002) found that the perceived quality of health care, and consumers' ratings of how comfortable they felt in the waiting environment were significantly greater for well-appointed waiting rooms than for those with outdated furniture, poor lighting, no artwork and a sterile appearance. Cameron et al. (2003) found that in a low-cost situation, music has a positive influence on mood, where mood is positively correlated with overall service evaluation. But they found no influence of waiting-length evaluation on overall service evaluation.

### *3.3. Service quality dimensions*

Taylor (1995) found that objective waiting time, involving either a delay of 10 minutes or no delay at all, did not significantly influence consumers' responses to the Servqual dimensions of empathy and assurance, but did influence the tangibles and reliability dimensions. The more control the service provider was perceived to have over the cause of waiting, the lower the overall and specific evaluation of service dimensions (reliability, responsiveness and assurance). Tangibles, reliability and responsiveness were rated more highly by consumers whose waiting time was filled with activity than by consumers whose waiting time was not filled with activity. How the waiting time was filled—that is, whether the activity related to the service or not—had no impact on the tangibles, reliability and responsiveness dimensions. The highest evaluations were found for tangibles, reliability and responsiveness for waiting consumers who perceived that the service provider had low control over the delay, and whose time was filled with an activity.

*3.4. Summary*

From the review above, we conclude that there are no consistent findings in the various service sectors in question, with respect to the impact on service evaluation of a waiting experience with prearranged appointments. No field study has examined the link between waiting and service quality dimensions. In the next section, we discuss the research questions of our empirical study concerning the impact of waiting on service evaluations in health care situations.

## 4. Research questions

This empirical study investigated the impact of variables related to the waiting experience on the five service quality dimensions and if this effect is the same in different outpatient clinic environments. To answer this question, we used a three-step approach.

First, we evaluated whether the service environment, the individual outpatient clinic in which a wait occurred, had a significant effect on each of the five service quality dimensions (tangibles, reliability, responsiveness, assurance and empathy). In other words, did consumers perceive some of the service quality dimensions differently in each of the 9 outpatient clinics studied? Although the clinics are situated in the same university hospital, there were reasons to believe that the perceptions of service quality would be different from one clinic to another. The service environment of the clinics, including the design of the waiting rooms, the attitude of the service employees, and the appointment systems, were clearly different.

Second, we investigated whether some variables of the waiting experience help to explain any variation that might occur in consumer perceptions of service quality. The variables investigated are related to four of Maister's (1985) eight propositions on the psychology of waiting: uncertain vs. certain duration of waiting, unexplained vs. explained waiting, solo vs. group waiting, and unoccupied vs. occupied waiting. The first two propositions can be controlled only by the service provider, and the last two may be under the control of both consumer and service provider. The selection of waiting experience variables was based on the availability of data. We were particularly interested to discover whether waiting experience variables have different effect on some of the Servqual dimensions. Would we find, as did Taylor (1995) in her experimental study, that some elements of the waiting experience have more impact on tangibles and reliability than on responsiveness, empathy and assurance? Taylor (1995) also found that occupied time had a positive influence on tangibles, reliability and assurance. We did not find any other study that had examined the relationship between the waiting experience variables investigated in the present study, and service quality dimensions. A few studies looked at the relationship between these waiting experience variables and general service evaluation and/or consumer satisfaction. For instance, Dansky and Miles (1997) and Nauman and Miles (2001) found that keeping consumers occupied during waiting in a health care situation had a positive effect on their evaluation. Katz et al. (1991) found that providing consumers with information on the time that they can expect to

spend in a queue tends to improve the accuracy of consumers' perception of waiting, but does not influence their level of satisfaction. A positive effect of information on waiting duration on service evaluation was found by Hui and Tse (1996).

In this second stage, we were also interested to determine whether there are interaction effects between the waiting experience variables and the outpatient clinics. Significant interaction effects would suggest that the effect of waiting perception management techniques depends on the outpatient clinic in which they are applied. This may lead to a contingency approach in the application of waiting perception management techniques.

In the third stage, we introduced objective and subjective waiting times as covariates in the analysis. The expected positive correlation between objective and subjective waiting times suggests that at least one or the other variable should be included as covariate. There is evidence supporting a negative relationship between objective waiting time and consumer satisfaction in the fast-food sector (Davis and Vollmann, 1990; Davis and Heineke, 1998) and the banking sector (Katz et al., 1991). In the airline sector, research has shown a negative effect of objective waiting time on overall service evaluation (Taylor and Claxton, 1994) and on the service quality dimensions of responsiveness, empathy and assurance (Taylor, 1995). In health care, the effect of objective waiting time on overall consumer satisfaction is demonstrated in Dansky and Miles (1997). It is well recognized that subjective waiting time influences service evaluation (e.g. Katz et al., 1991; Kumar et al., 1997).

## 5. Empirical study

### *5.1. Data collection*

On-site data were collected during one week in 9 outpatient clinics of a single university hospital. A questionnaire was given to the clinic's patients when arriving at that particular outpatient clinic with the request to fill in the document at home, after the consultation. A total of 650 participants (mean age 44.1 years; 34.2% male) completed and returned a questionnaire with a response rate of 47.3%. The objective waiting time was measured by recording the clock time when each participant entered the outpatient clinic and the time when the consultation was started. The appointment times for each consumer were also noted. A coding system was used to match the objective waiting time, the outpatient clinic, and the information provided by each participant in the questionnaire. Participants were not informed that their objective waiting time had been recorded.

The self-administered questionnaire comprised four major parts. The first part covered demographic questions (age and gender) and questions concerning the participant's previous outpatient clinic visits. The second section contained questions concerning participants' perceptions of their current waiting experience, based on the relevant propositions from Maister (1985). Consumer satisfaction with the waiting experience was scored on a seven-point Likert scale (ranging from 'strongly disagree' = 1 to 'strongly agree' = 7). Perceived waiting time was measured with an open-ended question requiring

participants to estimate the duration in minutes of the wait that occurred before they were called into the appointment room. The third part included 22 statements drawn from the Servqual perception scale, concerning participants' perceptions of the quality of the service at that particular outpatient clinic of the university hospital. Scales for each factor were created by summing the scores of the individual items and dividing by the number of items. The reliability values for the five factors were: tangibles ($\alpha = .82$), assurance ($\alpha = .85$), reliability ($\alpha = .84$), responsiveness ($\alpha = .71$), and empathy ($\alpha = .83$). The final section included one question about overall consumer satisfaction. The seven-point Likert scale ranging from strongly disagree (1) to strongly agree (7) was used for the questions concerning service quality and consumer satisfaction.

*5.2. Results*

We first examined the difference in service quality perceptions between consumers of the different outpatient clinics. A one-way ANOVA allowed us to test the main effect of each kind of outpatient clinic on the average perception scores of the Servqual dimensions. Although we did not find a normal distribution for the five Servqual dependent variables, we still used an ANOVA because this tool is robust against deviations from normality (Tabachnick et al., 1983:77). Only in the cases of reliability and responsiveness were we unable to reject the null hypothesis of equal variances across all groups. In other words, we found that the assumption of homogeneity of variance across all groups was not true for tangibles, assurance and empathy. ANOVA is also robust against violations of this assumption, at least where all groups are of roughly equal size (Tabachnick et al., 1983:77), as is the case in our study.

The ANOVA (Table 2) yielded significant differences between the outpatient clinics in participants' perception of the service quality dimensions of tangibles ($F = 19.84$, $p = .00$) and reliability ($F = 2.86$, $p = .004$). The ANOVA also shows that the R-squared (i.e., the ratio of the between-group sum of squares and the total sum of squares) is significantly larger for tangibles than for any of the other Servqual dimensions (adjusted $R^2 = .204$). This means that the variable 'outpatient clinic' explains some of the variance in participants' perceptions of service quality as related to the tangibles.

We then used an ANOVA to assess the impact of unoccupied vs. occupied waiting, uncertain vs. known waiting, unexplained vs. explained waiting, solo vs. group waiting, and the outpatient clinic, on the five service quality dimensions. Table 3 shows that the variances of participants' perception rating on the tangibility and reliability dimensions are best captured by the variables we introduced in this model. The adjusted $R^2$ for the tangible dimension increases from .204 to .277 and for the reliability dimension from .026 to .112.

The increase of the adjusted $R^2$ for tangibles means that the other variables of the waiting experience had a significant impact on the perception of this dimension, besides, or in interaction with, the effect of the outpatient clinic variable. Significant two-way interaction effects are the interaction between outpatient clinic and explained waiting ($F = 2.28$, $p < .05$), occupied and known waiting ($F = 9.42$, $p < .005$), and occupied and explained waiting ($F = 11.42$, $p < .005$). For certain outpatient clinics, the

tangibles evaluation was higher for participants who had been informed of the reasons for a delay than for those left waiting without explanation (explained vs. unexplained waiting). Participants in other outpatient clinics did not differ with regard to tangibles evaluation, whether they were informed about the reasons for waiting (explained waiting) or not (unexplained waiting) (Figure 3a). Consumers who did not know that they would have to wait (uncertain waiting) scored tangibles higher when they had nothing to do during the wait (unoccupied waiting) compared with those who had something to do during the wait (occupied waiting). Among participants who knew that they would have to wait (known waiting), the tangibles perception was almost equal for those who had something to do (occupied waiting) and those who did not (unoccupied waiting) (Figure 3b). Participants who knew *why* they had to wait (explained waiting) and who had nothing to do, scored tangibles higher than consumers who did not know why they were waiting. When participants had something to do (occupied waiting), providing them with the reasons for the waiting did not make any difference to their perception of tangibles (Figure 3c).

INSERT FIGURE 3a 3b 3c ABOUT HERE

The increase of the adjusted $R^2$ for the reliability dimension is caused by two pure main effects: the outpatient clinic and the extent to which waiting is explained. Moreover, the adjusted $R^2$ (= .112) of this model is much higher than the adjusted $R^2$ (=.026) of the previous model where only the outpatient clinic was used as a grouping variable. Consumers who knew why they must wait (explained waiting) scored reliability higher (mean = 6.13, SD = .71) than consumers to whom the reason for waiting was not explained (mean = 5.56, SD = 1.01) ($t = 6.37$, $p = .00$).

The limited adjusted $R^2$ for the other dependent variables (responsiveness, assurance and empathy) supports our belief that the current model does not adequately explain the variance in perception between participants with regard to these aspects. Accordingly, we judged that it is not worthwhile to discuss what were, in many cases, complicated interaction effects.

With subjective and objective waiting time included as covariates in the analyses, the adjusted $R^2$ for tangibles increases from .277 to .284, for reliability from .112 to .132, for responsiveness from .049 to .072 and for empathy from .047 to .077 (Table 4). It is interesting to note that subjective waiting time is more significant as a covariate than objective waiting time. (However, analysis with objective waiting time alone did yield significance). Subjective waiting time is an important covariate in explaining the variance of consumer's perceptions of reliability ($F = 8.48$, $p <. 005$). The main effect of the outpatient clinic becomes even insignificant. The covariate subjective waiting time is not unimportant in the case of responsiveness and empathy; the $R^2$ results, however, are still low.

## 6. Discussion

This is the first field study relating variables concerning the waiting experience—unoccupied vs. occupied waitings, uncertain vs. known waitings, unexplained vs. explained waitings and solo vs. group waitings—with the service quality dimensions of tangibles, reliability, responsiveness, assurance, and empathy.

Consumers at different outpatient clinics gave different ratings for the tangible and reliability dimensions. Thus, as expected, the service quality dimensions of outpatient clinics in the same university hospital are perceived to be different (Figure 4).

INSERT FIGURE 4 ABOUT HERE

Our results show that the waiting-related variables that we studied have more impact on the tangibles and reliability dimensions than on other service quality dimensions. Thus, we expect that the perceptions of tangibles and reliability are more sensitive to the influence of the waiting experience than that of the other service quality dimensions. It might well have been expected that the waiting experience variables would have a greater effect on the perception of responsiveness than on the tangibility or reliability perception. The limited amount of explanation by the waiting variables studied here on responsiveness can be explained as Taylor (1995) suggested: consumers perceive delay as an undependable service that is not related to the employees' willingness to help. Although our study confirms that there is no obvious effect of waiting experience variables on responsiveness, Figure 4 shows that responsiveness fairly consistently received the lowest perception scores in each of the outpatient clinics. A Wilcoxon signed-rank test showed that 70% of all respondents gave a perception score for responsibility that was lower than that for reliability. In other words, there seems to be a general problem with responsiveness in all outpatient clinics, and waiting perception techniques (at least, those that were studied here) have no effect on consumers' perception of poor responsiveness.

Figure 3(a) shows that in outpatient clinics that were scored high on tangibles, giving more information on the cause of waiting did not change consumers' perception of tangibles. But when an outpatient clinic has a negatively perceived service environment, consumers gave a significant lower score to the tangible dimension if they had no information about the cause of waiting[4]. In other words, there is considerably greater potential for waiting perception strategies to be effective in these outpatient clinics.

Nonetheless, we found a highly significant main effect of providing information about the cause of waiting on the perception of reliability. Several authors have revealed the importance of explaining the cause of waiting, but no empirical evidence has been reported until now. We also found support for

[4] Clinic I was the only exception, but this clinic has a very low average score on tangibles even when participants were given information about the cause of the delay.

Maister's (1985) original proposition that if the consumer does not know the reasons for waiting, the duration will seem to be longer than when the reason for waiting is known. In our case, the subjective waiting time was an average of 7.41 minutes longer than the objective waiting time when participants were given no information on the cause of waiting. If some explanation was given, this overestimation of the consumers was reduced to 0.28 minutes ($p < 0.05$). Explaining the reasons, then, still has a main effect on the perception of reliability, even after introducing subjective waiting time as a covariate. In other words, explaining the reason for waiting has both a direct and an indirect effect on reliability perceptions. This finding is significant, because reliability is generally considered as the most important service quality dimension.

We found another interesting interaction between giving information about the cause of a delay to consumers and the extent to which consumers' time was filled while waiting. If participants had nothing to do, giving information about the reasons for waiting significantly increased their perception of tangibles. Explaining the reasons for waiting seems to have no effect on the perception of tangibles if consumers have something to do, although it still has an effect on reliability. Providing reasons for waiting is thus extremely useful when consumers have nothing to do.

No significant effects of the waiting were found for assurance. Apparently, assurance is a more general feeling that is not influenced by the variables of the waiting experience included in our research.

Some researchers have argued that objective and subjective waiting times can influence the evaluations of services (Hornik, 1984; Taylor, 1995). The focus of operations management approach to waiting management is to minimize objective waiting time. In the present study, we controlled for the effect of objective waiting time by including it as covariate in the analyses. Since an outpatient clinic environment can influence the perception of objective waiting time (Katz et al., 1991; Kumar et al., 1997), we also included subjective waiting time as a covariate. The results show that subjective waiting time better explains the variance of the perceptions of different service quality dimensions than does objective waiting time. This is in accordance with Pruyn and Smidts (1998), who found that the effect of objective waiting time on the appraisal of the waiting experience is mediated by subjective waiting time.

### *6.1. Limitations and future research*

The results of this study improve the understanding of the impact of waiting on service evaluations. The study was, however, subject to certain limitations. Most obviously, it focused on one type of waiting—pre-process waiting—and although it is expected that the results would be similar for queue waiting, this cannot be generalized from the present study alone, and thus requires further research.

It is impossible in a single study of this size to consider all the concepts relevant to the psychology of waiting. The waiting-related variables we studied explain at most 28% (tangibles) of the variability of the service quality dimensions. In other research (Chebat et al. 1995; Cameron et al., 2003), mood was found to have a significant impact on service evaluations. Future research should be directed at

including other aspects of the psychology of waiting, such as mood, anxiety, the equity of the waiting, and the value of the service.

We also used only objective and subjective waiting times as covariates in the analyses. Other covariate factors with respect to waiting in outpatient clinics include the design of the waiting environment and the presence of service employees during the wait. Moreover, this study does not account for all the strategies that can influence waiting time experience, such as service recovery approaches and mood enhancing strategies. There are also no expected or acceptable waiting times incorporated in the model we tested.

The present study assumed that consumers perceive service quality in the five dimensions proposed in Parasuraman et al. (1988). We chose to use the perception of service quality as the predictor of the service quality concept (Cronin and Taylor, 1992; Oliver, 1993; Teas, 1993; Woodruff et al., 1983). Other authors have claimed that the incorporation of expectations is necessary to measure service quality (Parasuraman et al., 1988; Carman, 1990). It would be interesting to study whether the sole use of perceptions is more acceptable than the expectations–perceptions approach.

The present study was conducted in only one university hospital. A prime motivation for studying outpatient clinics of one hospital was to limit the variance of factors related to the specific hospital environment. Future research should investigate different hospitals to determine whether similar relationships can be found.

Furthermore, owing to the limited amount of data, we can only study two-way interaction effects in the ANOVA and covariances. More data would allow for the analysis of higher-order effects. We expect that the influences of waiting variables on service evaluations can be on an individual level (differences between consumers) and on the group level (differences between outpatient clinics). Consequently, with a higher amount of data, multilevel analysis to test the effect of individual and group level influences could be conducted.

### *6.2. Managerial implications*

According to our findings, the psychology of waiting plays a vital role in service evaluation by consumers. The conclusions drawn from this research are therefore important for organizations that want to manage their waiting times to influence the service evaluations of their consumers. Our research has pointed out a number of important factors of the service quality dimensions that can be directly or indirectly influenced by an organization.

The waiting experience variables we studied exert their strongest influence on the tangible and reliability aspects of outpatient clinics. The management of waiting time—either by operations management techniques or a psychological approach to waiting—appears to have most influence on tangibles and reliability, and less on responsiveness, assurance and empathy. The fact that the perception of the tangibility and reliability dimensions best reflects the waiting experience is an

interesting observation, because among the service quality dimensions, the perception of these two dimensions best differentiates between the outpatient clinics.

A second significant managerial conclusion is that explaining to consumers why they must wait is the single most effective waiting perception management technique in relation to consumer perception of reliability. Further research should clarify whether this finding can be supported in other service environments. The single best piece of advice that we can currently offer managers of outpatient clinics is *to give consumers information about the reasons why they must wait*. This is particularly true where the waiting environment is not well appointed, and where consumers have nothing to do. Explaining the reasons why waiting is necessary goes one step further than just giving information about the expected duration of the waiting. More insights into how and when to communicate information about waiting, and the impact of this on consumer perceptions of reliability, is another way of extending this research.

From a managerial point of view, a powerful feature of this study was the participation of multiple comparable service units (outpatient clinics). This allows management of these outpatient clinics to compare their situation with that in the other outpatient clinics. The problem with waiting and service quality is that there are no absolute norms of what constitutes good or bad practice. Therefore, managers judge their relative performance by comparing or benchmarking their situation with other similar service units. The spider charts (for example, in Figure 4) show interesting managerial information for each of the outpatient clinics. There are clinics that clearly perform better than their neighbors in terms of the service quality dimensions. It is also notable that in every one of the 9 clinics, the perception of responsiveness received the lowest average rating of the five service quality dimensions.

This study has shown that subjective waiting time is a better covariate in explaining the variance of the Servqual dimensions than the objective waiting time. This means that the psychological approach of dealing with waiting times is at least as important as the operations management approaches. Give consumers a reasonable explanation for the experienced waiting time and they will regard your service more positively in terms of reliability and tangibles.

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Figure 1: Sequence of waits in service delivery.

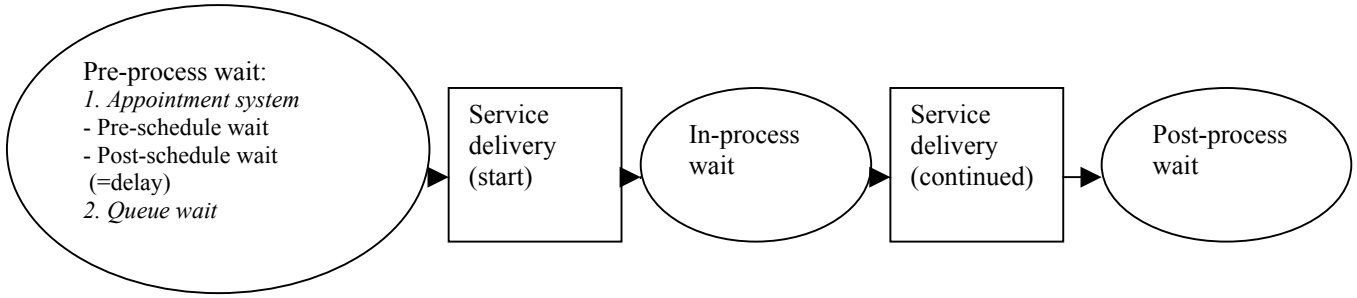


Figure 2. Subjective interpretation of waiting.

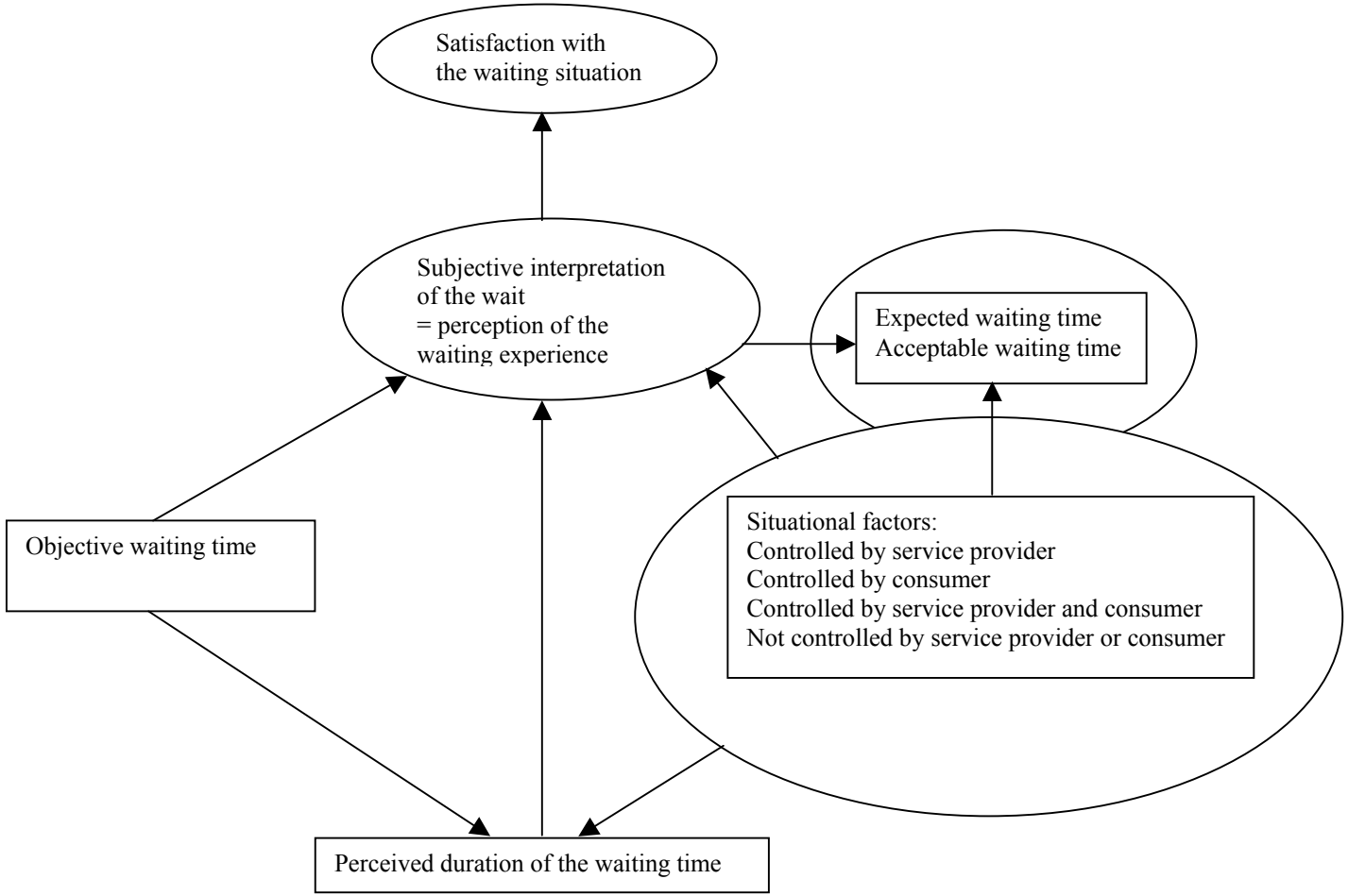


Table 1. Overview of the literature on waiting and service evaluations.

| Author(s) | Research design | Type of waiting | Services studied | Dependent variable | Independent variables |
|---|---|---|---|---|---|
| Houston et al. (1998) | Cross-sectional survey | Queue waiting | Bank | Service quality evaluation | Attributions, negative affect, apology, acceptable waiting, waiting cost, expected wait, transaction importance, encounter with service employee, prior service experience, perceived duration |
| McKinnon et al. (1998) | Cross-sectional survey | Pre-processing delay | Outpatient clinics | Consumer satisfaction | Length of consultation, objective average waiting time |
| Pruyn and Smidts (1998) | Cross-sectional survey | Pre-processing delay | Outpatient clinics | Consumer satisfaction | Appraisal of waiting, objective waiting time, acceptable waiting time |
| Davis and Heineke (1998) | Cross-sectional survey | Queue waiting | Fast food sector | Consumer satisfaction | Actual, perceived and expected waiting time |
| Durrande-Moreau (1999) | Literature overview empirical studies | | | | |
| Durrande-Moreau and Usunier (1999) | Cross-sectional survey | Queue waiting | Transport sector | Consumer satisfaction | Objective waiting time, time styles |
| Boudreaux et al. (2000) | Cross-sectional survey | Queue waiting | Urgent care | Consumer satisfaction | Consumer demographics, visit characteristics |
| Nauman and Miles (2001) | Cross-sectional survey | Queue waiting | Urgent care | Consumer satisfaction | Occupied waiting, expected waiting, objective waiting time, voice |
| Cameron et al. (2003) | Experiment | Pre-process delay | Educational services | Overall experience | music, mood, length of wait |

Table 2. Analyses of Variance: evaluation differences between patients of different outpatient clinics

**ANOVA**

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| tangibles | Between Groups | 134,661 | 8 | 16,833 | 19,840 | ,000[a] |
| | Within Groups | 491,223 | 579 | ,848 | | |
| | Total | 625,884 | 587 | | | |
| reliability | Between Groups | 15,726 | 8 | 1,966 | 2,863 | ,004[b] |
| | Within Groups | 376,262 | 548 | ,687 | | |
| | Total | 391,988 | 556 | | | |
| responsiveness | Between Groups | 14,917 | 8 | 1,865 | 1,278 | ,252 |
| | Within Groups | 841,767 | 577 | 1,459 | | |
| | Total | 856,684 | 585 | | | |
| assurance | Between Groups | 6,518 | 8 | ,815 | 1,327 | ,227 |
| | Within Groups | 300,226 | 489 | ,614 | | |
| | Total | 306,745 | 497 | | | |
| empathy | Between Groups | 7,971 | 8 | ,996 | ,879 | ,534 |
| | Within Groups | 663,979 | 586 | 1,133 | | |
| | Total | 671,950 | 594 | | | |

a. Adjusted $R^2$ = ,204

b. Adjusted $R^2$= ,026

Table 3. Overview of Variance Analyses: effect of outpatient clinics and four propositions of Maister (1985) on the five service quality dimensions

Significant F-statistics reported

| | Tangibles ($R^2$ adj= .277) | Reliability ($R^2$ adj= .112) | Responsiveness ($R^2$ adj=.049 ) | Assurance ($R^2$ adj=.021 ) | Empathy ($R^2$ adj=.047 ) |
|---|---|---|---|---|---|
| Outpatient clinic | 11.14** | 2.00* | | | |
| Occupied wait | 4.21* | | | | |
| Known wait | | | | | |
| Explained wait | 9.04** | 16.53** | 7.02** | | 7.64** |
| Solo wait | | | | | |
| Outpatient * Occupied | | | | | |
| Outpatient * Known | | | 3.02** | | 2.81** |
| Outpatient * Explained | 2.28* | | | | |
| Outpatient * Solo | | | | | |
| Occupied * Known | 9.42** | | 7.52** | | |
| Occupied * Explained | 11.42** | | 3.87* | | |
| Occupied * Solo | | | | | |
| Known * Explained | | | | | |
| Known * Solo | | | | | |
| Explained * Solo | | | | | |

* p significant at .05 level

** p significant at .01 level

Figure 3. Interactive effects of outpatient clinic and four propositions of Maister (1985) on tangibles

Figure 3(a) Outpatient clinic - explained wait

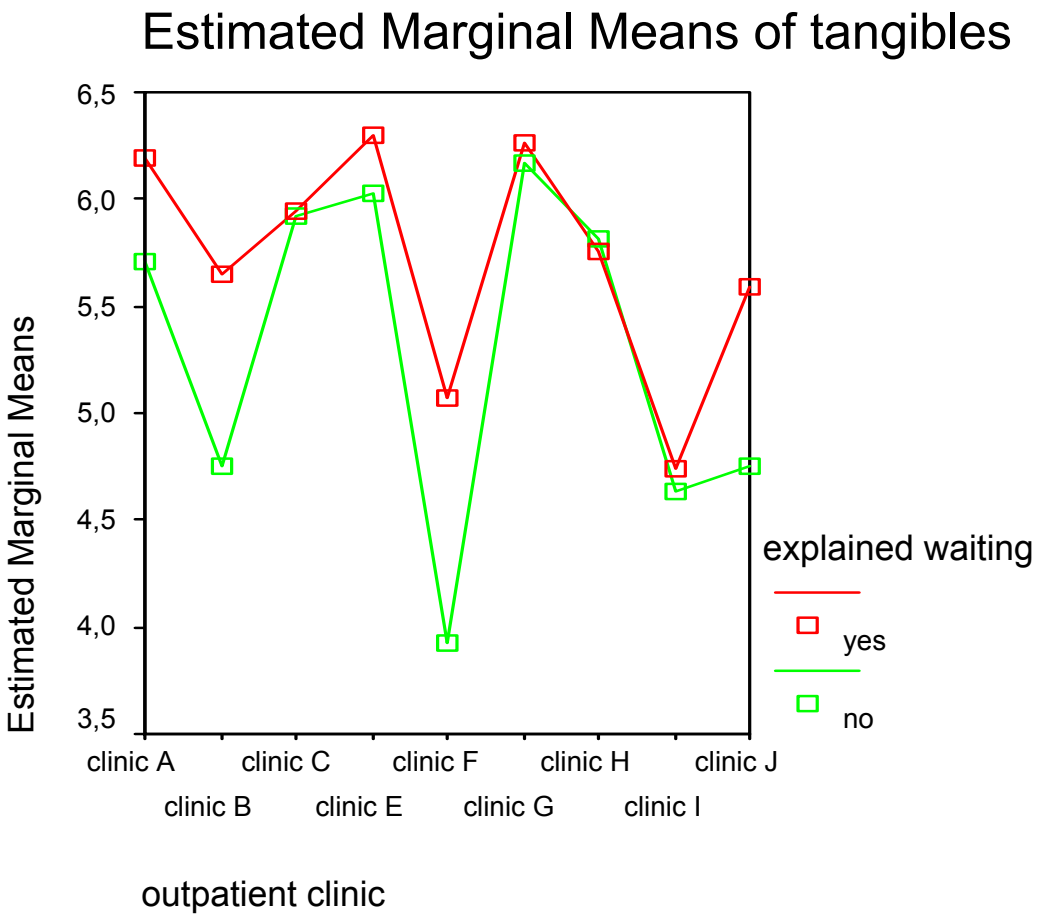


Figure 3(b) Occupied wait – known wait

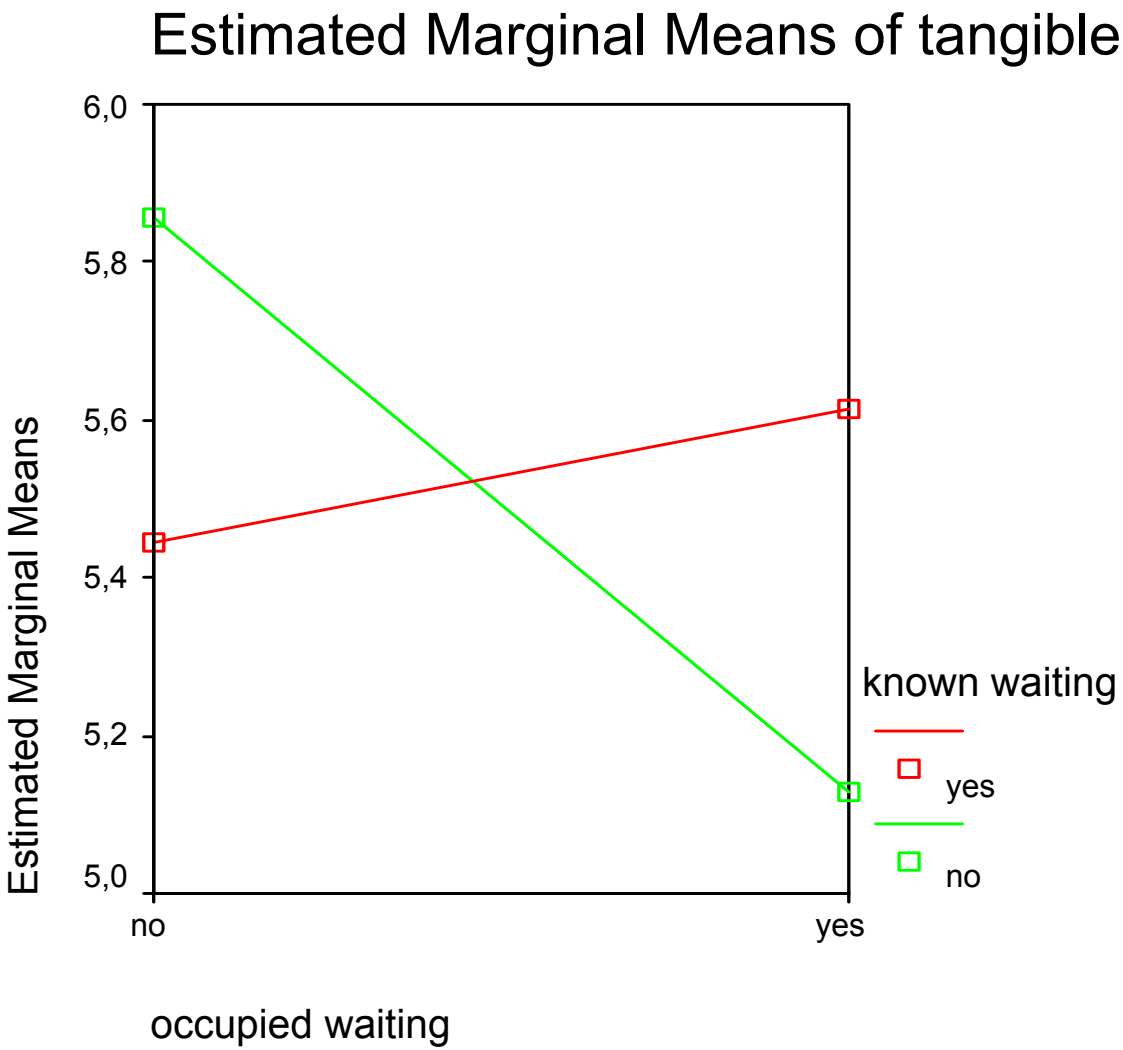


Figure 3(c) Occupied wait – explained wait

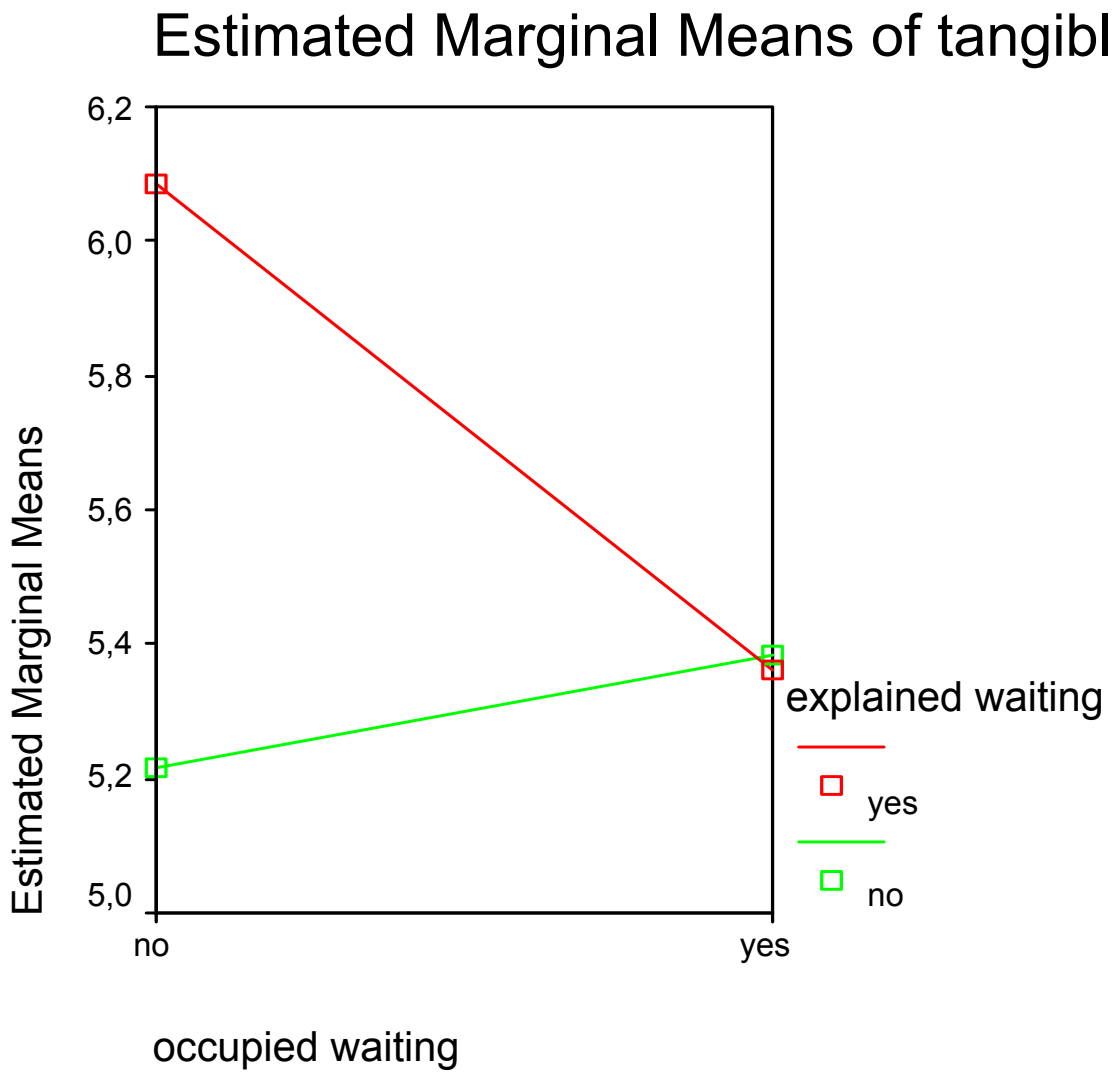


Table 4. Overview of Variance Analyses: effect of outpatient clinic, four of Maister's propositions (1985) and co-variates objective and subjective waiting time on the five service quality dimensions

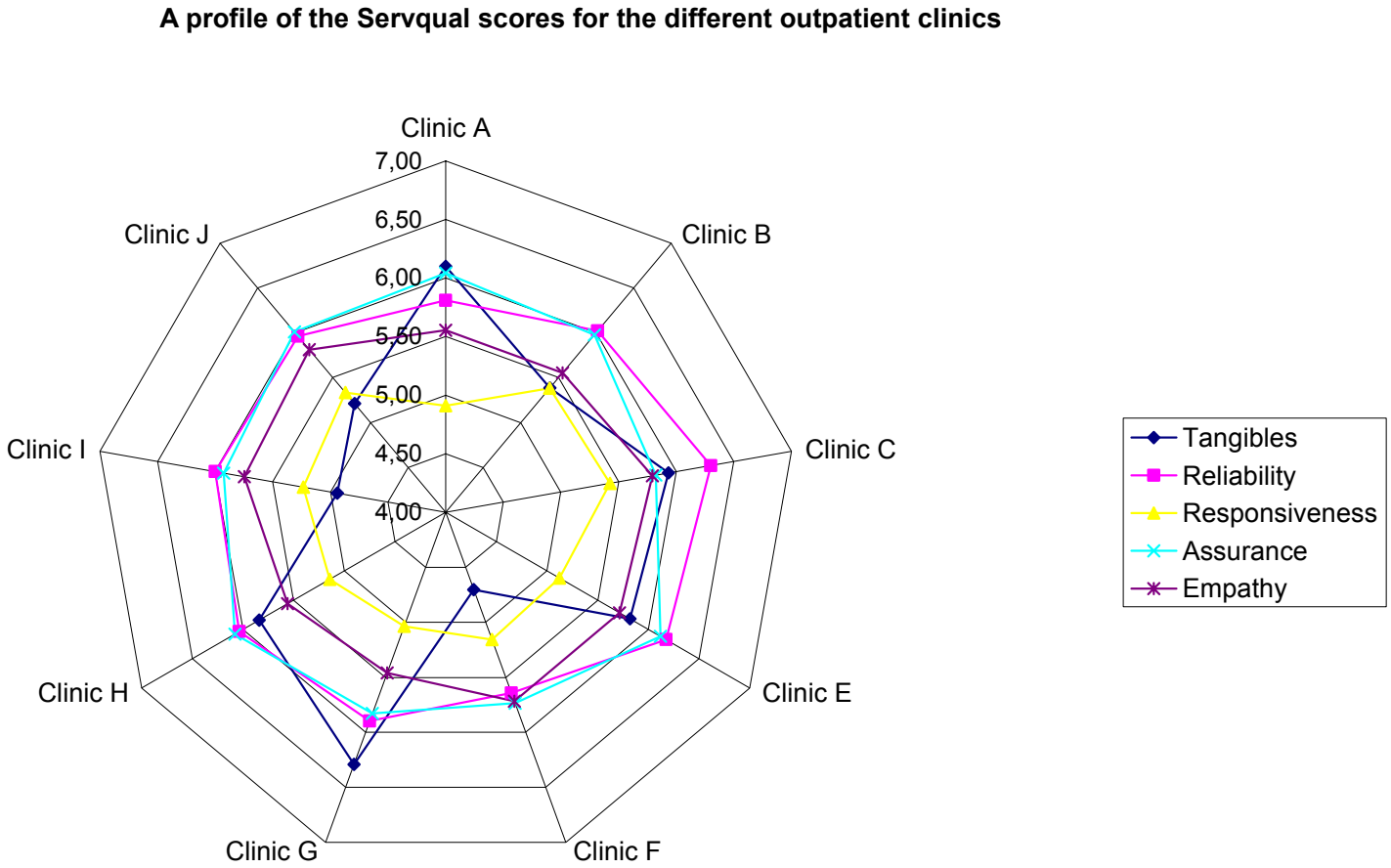
Significant F-statistics reported

| | Tangibles ($R^2$ adj= .284) | Reliability ($R^2$ adj=.132.) | Responsiveness ($R^2$ adj=.072 ) | Assurance ($R^2$ adj=.016) | Empathy ($R^2$ adj=.077) |
|---|---|---|---|---|---|
| Outpatient clinic | 9.37** | | | | 2.33* |
| Occupied wait | | | | | |
| Known wait | | | | | |
| Explained wait | 6.41* | 12.83** | 5.55* | | 8.96** |
| Solo wait | | | | | |
| Outpatient * Occupied | | | | | |
| Outpatient * Known | | | 3.23** | | 3.66** |
| Outpatient * Explained | 2.82** | | | | |
| Outpatient * Solo | | | | | |
| Occupied * Known | 6.92** | | 8.03** | | |
| Occupied * Explained | 13.14** | | | | |
| Occupied * Solo | | | | | |
| Known * Explained | | | | | |
| Known * Solo | | | | | |
| Explained * Solo | | | | | |
| Objective WT (C) | | | | | |
| Subjective WT (C) | | 8.48** | 6.30* | | 5.89* |

* p significant at .05 level

** p significant at .01 level

Figure 4. Radar Chart of the 5 service quality dimensions for 9 outpatient clinics



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