

**Asymmetric Effects of Expectation Disconfirmation and
Evaluability of Hospital Service Attributes on Consumer
Satisfaction**

Radboud University



Sjors Peters (s4624645)

Sjors_Peters@live.nl

Begeleider en eerste beoordelaar: Prof. Dr. G. Antonides

Tweede beoordelaar:

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Abstract

This study examines the determinants of consumer satisfaction of cancer patients with Dutch hospitals on the basis of perceived service attribute performance and disconfirmation of service attribute expectations. Evaluability theory argues that easy-to-evaluate attributes have a larger effect on consumer satisfaction than difficult-to-evaluate attributes. Predictions of asymmetric evaluations of gains and losses from prospect theory are combined with those from evaluability theory. Even though evaluability theory and expectancy-disconfirmation theory are not directly comparable, this study examines how evaluability influences the effects of asymmetric evaluations of positive and negative disconfirmation of service attribute expectations on consumer satisfaction. Furthermore, this study analyses the effect of patients' hospital experience on evaluability and the effect of the overall health status of patients on satisfaction.

This research was conducted by means of an online survey filled in by 198 Dutch cancer patients. Results showed a positive and significant effect of expectation disconfirmation on satisfaction. Additionally, negative disconfirmation had a larger effect on satisfaction than positive disconfirmation, supporting loss aversion theory. We did not find results supporting evaluability theory, as easy-to-evaluate attributes of hospital service did not have a significantly stronger effect on satisfaction than difficult-to-evaluate attributes. We found that patients who considered themselves to be experienced regarding hospitals would more easily view attributes as being easy-to-evaluate than non-experienced patients. No significant effect on this matter was found for the frequency of visits to the hospital. Strong evidence has been found for a positive correlation between self-reported health status and satisfaction, indicating that healthier people tend to be more satisfied with the hospital. We discuss both theoretical and managerial implications of our findings.

Keywords: Consumer satisfaction, evaluability, expectation disconfirmation, loss aversion, Dutch hospitals, cancer patients

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1. Introduction

In today's ever-growing landscape of competitive businesses, one core marketing objective is to achieve consumer satisfaction and consumer loyalty (Bansal & Gupta, 2001; Söderlund, 2005). To generate consumer loyalty, companies must strive for satisfied consumers (Singh, 2006; Lam, Zhang & Jensen, 2005). Having satisfied consumers has large economic benefits (Matzler & Hinterhuber, 1998; Reichheld, 1993; Singh, 2006). Consumer satisfaction will lead to increased market share, repeat purchases, positive word of mouth, increasing revenues and decreasing costs of attracting new consumers (Hoyer & Macinnis, 2001; Reichheld, 1993; Matzler & Hinterhuber, 1998; Caber, Albayrak & Ülger, 2012). Therefore, it is of great importance for companies to know what factors contribute to consumer satisfaction, as it is known as an essential element for long-term business success (Nam, Ekinici, Whyatt, 2011; Hoyer & Macinnis, 2001).

With the recent bankruptcies of the Amsterdamse Slotervaart hospital and the IJsselmeer hospitals in Lelystad, Emmeloord, Urk and Dronten, the Dutch hospital market has become a topic of discussion and worry in The Netherlands. Groenendijk (2018), citing Guus Schrijvers, suggests that many more hospitals will be in danger of bankruptcy in the upcoming years. Expenses of hospitals keep rising, whereas the returns and yields are diminishing. Previously, the Dutch government would financially support hospitals in trouble because of their philosophy that every region in the Netherlands needs a hospital that provides their inhabitants with good care. But with the election of the former minister for medical care, Edith Schippers, this financial support was no longer provided to the hospitals (Groenendijk, 2018). By privatizing the Dutch hospitals years ago, the expectation was that free-market forces would make medical care cheaper and more efficient (Groenendijk, 2016). However, these goals of making medical care cheaper and more efficient were not achieved. With an average occupancy rate of Dutch hospital beds of 60% in 2017 (Intrakoop, 2018), hospitals

more and more seek ways to increase this occupancy rate and thus increasing profits to become a healthier organization and avoid the danger of going bankrupt like the Amsterdamse Slotervaart hospital and the IJsselmeer hospitals. Increasing satisfaction will play a key role in achieving this by retaining current patients and attracting new ones.

Numerous studies have been conducted on the concept of satisfaction with a product as a whole (e.g. Richins & Bloch, 1991; Kotler, 2000; Wang & Wallendorf, 2006). For example, Richins and Bloch (1991) have found that consumer involvement and time since last purchase were related to consumer satisfaction on the overall product, cars in their case. Mugge, Schifferstein and Schoormans (2010) found that product attachment is related to satisfaction of photo cameras and mobile phones. However, only a few studies have looked into the distinct product/service attributes performance related to consumer satisfaction (Mittal, Ross, & Baldasare, 1998; Caber et al., 2012). It is possible that certain types of product/service attributes are more important than others in determining consumer (dis)satisfaction. Besides the distinction of several attributes of a service, the evaluability of these attributes became a topic of interest as well (Auh & Johnson, 2005). Attributes of a certain service or product can either be easy or difficult to evaluate (Hsee, 1996). The ease or difficulty of attribute evaluability is related to consumer satisfaction according to Hsee and Zhang (2010).

Another important influence on consumer satisfaction would be one's judgment of how well a product or service performs relative to the reference point of prior performance expectations (Oliver, 2014). Normally, it is expected that positive disconfirmation of the product or service performance expectations would result in consumer satisfaction, whereas negative disconfirmation of the product or service performance expectations would result in consumer dissatisfaction. According to prospect theory, people are much more sensitive to negative impacts than they are to positive ones (Kahneman & Tversky 1979). Therefore, one

could expect negative disconfirmation of the product or service performance to have a greater impact on consumer dissatisfaction than positive disconfirmation of the product or service performance has on consumer satisfaction. Mittal et al. (1998) have already found evidence for such asymmetric product evaluation.

As said before, only a few studies have looked into the distinct product attribute performance related to consumer satisfaction. Even fewer studies exist in which a service rather than a physical product is the subject of research (e.g., Chiou & Droge, 2006; Baker & Crompton, 2000). Over the past decades a new dominant logic for marketing evolved (Vargo & Lusch, 2004). In this new dominant logic for marketing the focus lies not with tangible resources, embedded value and transactions (as it used to), but with intangible resources, cocreation of value and relationships and is called the service-centered view of marketing or the service-dominant logic for marketing. A focus-shift has taken place towards increased importance of service. According to Lam and colleagues (2005) the quality of a service has been recognized as a major influence on consumer satisfaction, just as in the case of a physical product. Therefore, it would be of great interest and usefulness for service companies to know what service attributes would lead to the highest satisfaction.

The aim of this research is to gain insights into how expectation disconfirmation and attribute evaluability effect patient satisfaction in Dutch hospitals, leading to the following research problem statement.

How are hospital service attribute evaluability and attribute expectation disconfirmation in the evaluation of Dutch hospital performance related to consumer satisfaction?

The next chapter will provide an overview of the literature on which this research is based. Chapter 3 will explain the research methods, the sample, procedures and measures used for this research. The results and findings will be described in Chapter 4. Chapter 5 will provide the conclusions. Finally, chapter 6 entails a discussion in which the main findings are related to existing literature, the limits of this research, managerial implications and possible future research will be stated.

2. Theory and the Dutch hospital market

This chapter will provide an extensive description of several theories used in this research preceded by a description of the field of research, being the Dutch hospital market. Both the concepts of expectancy disconfirmation and evaluability theory will be discussed, along with theories about hospital experience and health-status of patients. Finally, an estimation strategy will be given.

2.1 The Dutch hospital market

In 2019 the Dutch hospital market counted 69 hospital organisations including 8 University Medical Centres (UMC's; Volksgezondheidszorg, 2020). These 69 organisations comprise 116 hospital locations. Over the last 50 years the amount of hospitals has greatly decreased due to bankruptcies and mergers. The current 79 hospitals combined have a total of 37,753 hospital beds available for patients. In 2009 the total amount of hospital beds was around 45,000. The drastic decrease of available hospital beds is mostly due to the fact that patients tend to get released from the hospital way sooner than before and often receive day treatment instead of staying in the hospital for a longer period of time. The average amount of days spent in the hospital per hospitalization decreased from 8.5 days in 2000- to 5.2 days in 2018. On average, women are more often hospitalized than men in The Netherlands. The expenses of the Dutch hospital have been rising every year between 2000 and 2016, according to Statistics Netherlands (CBS). Due to the increasing expenses of hospitals and the decreasing amount of time patients spend in the hospital (thus decreasing the income of hospitals) there is an increasing financial pressure since all Dutch hospitals are in private hands. Since the total national number of patients normally does not change drastically, hospitals are competing with each other to get the biggest share of these patients by, amongst other things, increasing patient satisfaction. Hence, there is a need for hospitals to gain new patients and retain current ones to avoid financial trouble or even bankruptcy.

2.1.1 Dutch Hospital market and satisfaction

Research on patient satisfaction in the Dutch hospital market has been done in several cases. The *Nederlandse Vereniging van Ziekenhuizen* (Dutch Union of Hospitals) has conducted research on the image of Dutch Hospitals in which over 16,000 patients filled in an online survey. Overall, an average score of 7.7 was given to Dutch hospitals by their patients and this was considered to be a decent score. Another conclusion that was drawn from this research is the fact that the free-market forces are not working as they are supposed to do. Generally, people still tend to choose hospitals closest to where they live or the ones that they are referred to by their family doctor. Efficiency and transparency came out as the biggest points of improvements; 67% of the respondents had faith in the hospital they went to. Of course, hospitals should strive to increase this percentage, which can be done by improving satisfaction rates.

Kleefstra, Zandbelt, de Haes and Kool (2015) conducted research on trends in patient satisfaction in all eight Dutch university hospitals. Their dataset consisted of 58,055 inpatients and 79,498 outpatients. They concluded that measuring satisfaction over time and analyzing changes and trends is very useful to study the effectiveness of improvement programs. This way, hospitals see where they have improved over the years, but more importantly where satisfaction is lagging behind and thus where they need to improve to increase satisfaction and loyalty from patients.

2.2 Consumer satisfaction

Consumer satisfaction is a widely used and researched concept and a lot of dissensus comes with it (Giese & Cote, 2000). One of the earlier and most dominant models to explain consumer satisfaction is Oliver's Expectancy-Disconfirmation Model (1980). In this model, consumer expectations about the performance or quality of a service are the main determinants of consumer satisfaction. Consumer expectations can arise from, for example,

personal experience, word of mouth and advertising (van Ryzin, 2013). Since the sources and information to form an expectation differ across individuals, consumers apply different standards in forming their judgment which either leads to satisfaction or dissatisfaction with a service (van Ryzin, 2013). Van Ryzin explained these different standards with a great example:

“And just as people stepping out of a dark theatre experience the bright afternoon sunshine differently from passersby already accustomed to the daylight, varying expectations may well explain how consumers differentially perceive, and in turn judge, the quality of the same goods or services.” (p.599)

So, because standards and expectations differ across people, their judgment, which ultimately will lead to a certain degree of satisfaction according to this model, will also differ. The gap between expectations and actual performance or quality is called disconfirmation by Oliver (1980). Disconfirmation can be either positive (where the performance/quality level is above expectations) or negative (where the performance/quality level is below expectations). When perceived performance/quality is equivalent to expectations simple confirmation results, which will lead to either satisfaction or a neutral state which is neither satisfaction nor dissatisfaction (Oliver, 1980). The basic expectancy-disconfirmation process is shown in Figure 1.

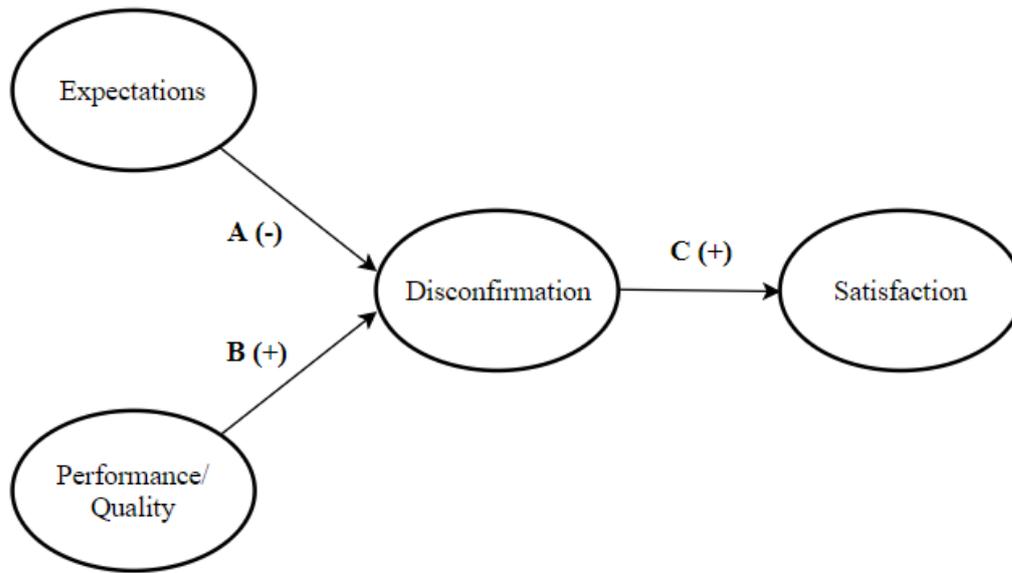


Figure 1

Conceptual model: The basic process of Expectancy Disconfirmation.

Adapted from “An Experimental Test of the Expectancy-Disconfirmation Theory of Citizen Satisfaction” by G. G. Van Ryzin, 2013, Journal of Policy Analysis and Management, 32, p.599.

As can be derived from the model, “link A represents the hypothesis that high expectations produce more negative disconfirmation, with all else equal, while link B represents the hypothesis that high performance leads to more positive disconfirmation, again with all else equal” (van Ryzin, 2013, p.599). Disconfirmation is positively related to satisfaction in link C, meaning that positive disconfirmation leads to more satisfaction and a negative disconfirmation will lead to less satisfaction.

Hypothesis 1 (H1): The relationship between disconfirmation and satisfaction with the hospital is positive.

The expectancy-disconfirmation model described above has been tested and supported by previous research on private-sector products and services (Anderson & Sullivan, 1993;

Churchill & Suprenant, 1982; Oliver & Swan, 1989; Tse & Wilton, 1998), indicating that expectancy disconfirmation is a determinant of customer satisfaction. Although the effects of expectancy disconfirmation on consumer satisfaction have been researched in the service-industry a number of times, studies that made a distinction between the different attributes a service consists of are rather scarce. Most attributes of services are non-physical, opposed to attributes of products, which often are physical (Dagger & Sweeney, 2007). In general, physical attributes would be more easily evaluable, but that is not necessarily always the case. Evaluability of the different non-physical attributes of a service could also differ. Ozturkcan, Aydin, Ates and Cetin (2009) actually examined consumer satisfaction in a hospital in Istanbul in relation with the expectancy-disconfirmation model—but made no distinction between the different attributes of the healthcare service—and found a significant positive relationship. Yoo (2005) did make a distinction between service attributes in hospitals in Asia and found that mainly reliability had an impact on consumer satisfaction, meaning that the ability to perform the needed medical services safely, reliably and accurately was most important. To the best of my knowledge, no study on hospitals in Europe, let alone in the Netherlands, has been conducted where consumer satisfaction was examined based on the expectancy-disconfirmation theory discriminating the different attributes of a service.

2.3 Loss aversion

Loss aversion is a concept first proposed by Kahneman and Tversky (1979) and can be interpreted as the asymmetric evaluation of gains and losses regarding a certain reference point. The endowment effect is an example of loss aversion and entails that people tend to be more reluctant to give up something they possess than they are willing to acquire that same something (Thaler, 1980). In the case of this particular study about satisfaction, the gains and losses refer to changes in perceived quality of service attributes as compared with the expectations about the quality of these service attributes.

The reference points used to evaluate product performance in Oliver's model (2014), which has been explained earlier, are expectations. Yan and Bao (2018) found that worse-than-expected outcomes had a bigger negative effect on housing satisfaction than the positive effects of better-than-expected outcomes. This conclusion seems to be in line with loss aversion theory, hinting at asymmetry of gains and losses. Mittal et al. (1998) were the first examining positive and negative disconfirmation of expectations regarding specific attributes of a product/service (cars in their study), instead of a product/service as a whole. They found that positive attribute expectation disconfirmation has different effects on consumer satisfaction than negative attribute expectation disconfirmation.

Hypothesis 2 (H2): The effect of negative disconfirmation of expectations on satisfaction with the hospital is stronger than the effect of positive disconfirmation on satisfaction.

2.4 Attribute evaluability

The concept of evaluability originates from Hsee (2010) and is defined as: "the extent to which a person has relevant reference information to gauge the desirability of target values and map them onto evaluation" (Hsee & Zhang, 2010, p. 344-345). Hsee and Zhang argue that both easy-to-evaluate and difficult-to-evaluate attributes may exist for products and services. As the definition of evaluability suggests, a decision maker is assumed to lack certain knowledge regarding a difficult-to-evaluate attribute to adequately judge a given value of an attribute. For an easy-to-evaluate attribute however, a decision maker is assumed to have enough knowledge and prior experience to be able to adequately judge the value of a certain attribute relative to other attributes of the same product or service (Dagger & Sweeney, 2007).

Evaluability as a concept was examined first by Hsee (1996) in order to show that a certain product or service would be evaluated differently when considered in isolation than when evaluated jointly. The isolation evaluation was called separate evaluation (SE) and

evaluation done jointly was called joint evaluation (JE). He illustrated this concept with an example regarding two dictionaries, A and B. The dictionaries were identical except for two features: number of entries and their current condition. Dictionary A had 10,000 entries and dictionary B had 20,000 entries. Despite having only half the entries dictionary B had, dictionary A's condition was brand new, whereas dictionary B had a defective cover (it was torn). Participants in both JE and SE were asked to indicate their willingness to pay (WTP) for the dictionaries. In the case of JE, participants were told that there were only two dictionaries to choose from and were then presented with the features of both dictionaries after which they would indicate their WTP for each dictionary. In the SE cases participants were informed that only one dictionary was available (and then got presented with either dictionary A or dictionary B) and were also asked to indicate their WTP for that dictionary. Hsee (1996) found that a preference reversal had occurred. In the JE case the WTP was much higher for dictionary B (27 dollars) than for dictionary A (19 dollars), whereas in SE dictionary A was associated with a higher WTP (24 dollars) than dictionary B (20 dollars). He called this joint-separate evaluation preference reversal the evaluability hypothesis. This hypothesis implies that a product or service contains both difficult-to-evaluate attributes and easy-to-evaluate attributes in which the former carry more weight when they are jointly evaluated, whereas the latter carry more weight when being separately evaluated (hence the preference reversal). In the example with the dictionaries "number of entries" is the difficult-to-evaluate attribute, since "the evaluator does not know how good a given value on the attribute is without comparisons" (Hsee, 1996, p.249). One does not know how good a dictionary with 10,000 (or 20,000) entries is when one has no dictionary to compare this number of entries with. The "defective" attribute is the easy-to-evaluate attribute in the example. Most people would prefer a non-defective dictionary over a defective one, without direct comparison with other dictionaries. As the evaluability hypothesis suggested, the "number of entries" attribute

carried more weight in JE and the “defective” attribute carried more weight in SE resulting in higher WTP for a dictionary. According to this hypothesis, “when a person judges an option in isolation, the judgment is influenced more by attributes that are easy to evaluate than by attributes that are difficult to evaluate, even if the difficult-to-evaluate attributes are more important” (Hsee, 1998, p. 109).

According to Auh and Johnson (2005), consumer satisfaction is based on an isolated evaluation after acquisition. Linking this logic to attribute evaluability, it is argued that easy-to-evaluate attributes would carry more weight in determining consumer satisfaction, since it is a SE (Auh & Johnson, 2005; Hsee, 1998). When combining the theories about expectancy-disconfirmation and evaluability, an interesting situation arises:

According to the evaluability hypothesis, difficult-to-evaluate attribute perceptions—likely leading to attribute performance expectations—may carry more weight in consumer choice process in JE, whereas the evaluation of the same attributes’ performance after acquisition (which is a SE) would be less important in generating satisfaction. For easy-to-evaluate attributes, the reverse would be true (Antonides & Hovestadt, 2019, p.9).

Hypothesis 3 (H3): Performance of easy-to-evaluate attributes of hospital service have a stronger effect on patient satisfaction with the hospital than difficult-to-evaluate attributes.

2.5 Hospital experience and evaluability

According to Alba and Hutchinson (1987), experienced consumers (or patients) possess more and more developed conceptual structures than novice patients and are better able to process, analyze and understand information as they acquire it. When novice and experienced consumers base perceptions on the same service attributes, they most likely weigh them differently (Alba & Hutchinson, 1987; Hsee, 1996). Dagger and Sweeney find similar results

in their 2007 study on service quality attribute weights. They too find that attributes are perceived and judged differently by experienced consumers than they are by novice consumers. Since novices are less able to process, analyze and understand information, they probably will give more weight to service attributes that are easily visible and understandable. On the other hand, the more experienced consumers will be able to process and understand information more adequately and thus might value other attributes, that are difficult-to-evaluate for novices, more. This means that difficult-to-evaluate attributes will become more easy-to-evaluate attributes as patients gain more experience in the hospital service. Since easy-to-evaluate attributes ought to generate more satisfaction in SE, it can be argued that experienced patients would be more satisfied with the hospital service than novice patients.

Hypothesis 4 (H4): Experienced patients view attributes as being more easy-to-evaluate than novice patients.

2.6 Overall health status and satisfaction

In general, it can be assumed that healthier people tend to be more satisfied. Satisfaction with hospital care would be no exception. Covinsky et al. (1998) found that patients at the University Hospitals of Cleveland with similar discharge health status had similar satisfaction with the healthcare, regardless of whether their health status improved, declined or remained stable. They stated that post-discharge level of health had a stronger relation to satisfaction than the degree of change in health during hospitalization. This indicates that healthier patients tend to report higher satisfaction with hospitals than patients who have experienced a health status improvement after hospital interaction. So, a better health status may result in higher overall satisfaction. This is in line with the findings of a study of Young, Meterko, Kamal and Desai (2000) in the United States, who also found that people who perceive themselves to be healthier are more satisfied with life in general, which carries over to satisfaction with healthcare. So far, only one study (to my knowledge), that of Hekkert,

Cihangir, Kleefstra, van den Berg and Kool (2009), has examined the effect of health status on hospital satisfaction in the Netherlands. They found that health status did have a significant influence on patient satisfaction.

Hypothesis 5 (H5): A higher self-reported health status of patients will result in a higher overall satisfaction with the hospital.

2.7 Estimation strategy

In this research, the effects of performance, expectation disconfirmation and evaluability will be estimated by Ordinary Least Squares (OLS). In Eq. (1), y_i denotes the measure of satisfaction for individual i ; variables x_{ij} denote the measure of performance, resp. disconfirmation, of attribute j for individual i (J is the number of relevant attributes); x_{ik} denote sociodemographic variables for individual i (K being the number of variables); the coefficients α show the effects of variables x on y ; ε_i is a normally distributed error term.

$$y_i = \alpha_0 + \sum_{j=1}^J \alpha_j x_{ij} + \sum_{k=1}^K \alpha_k x_{ik} + \varepsilon_i \quad (1)$$

It is assumed that the effects of performance, resp. disconfirmation may depend on evaluability of the attributes linearly, thus that α_j is a linear function of evaluability e , i.e., $\alpha_j = b_0 + b_1 e_j$. Eq.(1) can then be written as Eq. (2):

$$y_i = \alpha_0 + \beta_0 \sum_{j=1}^J x_{ij} + \beta_1 \sum_{j=1}^J e_{ij} x_{ij} + \sum_{k=1}^K \alpha_k x_{ik} + \varepsilon_i \quad (2)$$

3. Method

This chapter will explain how the research was conducted. First, the survey sample and the procedure used to reach this population will be discussed. Next, the measurement instrument will be described.

3.1 Survey sample and procedures

This research used quantitative data collection by means of an anonymous online survey, constructed in Qualtrics (See Appendix C). The unit of analysis was cancer patients who have been under treatment in a Dutch hospital. To obtain respondents for the online survey, *het Nationaal Fonds tegen Kanker* (NFtK; National Fund against Cancer) was contacted to see whether they could be of any assistance in reaching out to cancer patients. After a couple of conversations they agreed to assist in reaching as many potential respondents as possible. Personal networks of NfTK and their website were used to this end. Unfortunately, far too few respondents were generated through this. I then used my own personal networks in order to get more respondents. Friends, family and colleagues of aforementioned were used to create a snowball effect. Unfortunately, this too had little success. Via an acquaintance I have heard about the existence of Facebook groups of fellow companions for people who have had to go through cancer treatment and the experience as a whole. In these groups, cancer patients can share their experiences, help and support each other and discuss anything related to cancer. The vast majority of the respondents came from such Facebook groups. Moderators of these groups were contacted to ask whether they were willing to share some context of the research and a link to the online survey on their page. Because people in these Facebook groups are actively engaging and talking about cancer, treatment and their experience in general, they were very much intrinsically motivated to fill in the survey. Since most Facebook groups contained only people of one certain form of cancer, and not every Facebook group was willing to participate, some forms of cancer are

overrepresented while other forms are underrepresented. In the end, 198 patients filled in the online survey. Respondents participated voluntarily and were able to withdraw from the survey at any moment. Before starting the survey, participants were informed about the anonymity of the survey, usage of the results and the co-operation with NFtK. Some moderators of Facebook groups requested to be informed about the results of the study and this was agreed.

3.2 Measurement instrument

Previous literature, but mostly a national study from the *Nederlandse Federatie van Kankerpatiënten organisaties* (NFK; Dutch Federation of Cancer Patients organisations) was used to find out which attributes of hospital service were deemed most important for patients when rating a hospital service. In this study by NFK, 7376 patients filled in their questionnaire (NFK, 2019) 15 attributes were derived and used in the online survey for this study (see Appendix A).

Constructs were measured using a 7-point semantic differential scale with 4 being the neutral midpoint, meaning it was neither good nor bad. Constructs measured in the survey were:

Performance: In order to measure performance the following questions were incorporated in the survey: 11 out of the 15 attributes were asked to judge using the question “How would you judge the following aspects of the hospital? (1) Very bad – (7) Very good”, with 4 being neutral. To prevent confusion, a differently formulated question was asked for judging the remaining 4 out of the 15 attributes “In your opinion, how does the hospital score regarding the following aspects? (1) Very bad – (7) Very good”, with 4 being neutral.

Disconfirmation: In order to measure if there was any disconfirmation between their expectations and the perceived performance of the hospital service, the following question

was incorporated in the survey based on the work of Oliver (1980): “How have the following aspects of the hospital performed in comparison to your expectations? (1) Much worse than I thought – (7) Much better than I thought”, with 4 being the same as expected. The question was asked for each of the 15 hospital attributes. This scale has also been used by Lankton and McKnight (2012). All values above 4 indicate positive disconfirmation, all values below 4 indicate negative disconfirmation.

Evaluability: In order to measure the ease or difficulty of evaluating attributes of hospital service for respondents, the following question was incorporated in the survey: “How was evaluating the following aspects of hospital service for you? (1) Very easy – (7) Very difficult, with 4 being neither easy nor difficult. The question was asked for each of the 15 hospital attributes. This scale is based on the study of Antonides and Hovestadt (2019).

Hospital experience: In order to measure hospital experience of respondents the following questions were incorporated in the survey: “How often have you been to the hospital you were treated in for medical reasons?” Answers were given based on a 7-point scale: 1–4 times (code 1), 5–8 times (code 2), 9–12 times (code 3) 13–16 times (code 4), 17–20 (code 5), 21–24 (code 6), 25 times or more (code 7). “How experienced would you rate yourself? (1) Very inexperienced – (7) Very experienced, with 4 being neutral.

Self-reported health-status: In order to measure the self-reported health-status of respondents the following question was incorporated in the survey: “How healthy would you rate yourself at this moment? (1) Very unhealthy – (7) Very healthy”, with 4 being neutral. Previous research on self-reported health-status from van Doorslaer and Jones (2003) and Young, Meterko, Kamal and Desai (2000) used a 5-point semantic differential scale. In order to use the same scales throughout the survey, a 7-point semantic differential scale was used instead of a 5-point semantic differential scale. Most of the examined studies on this matter have used a single item to measure self-reported health status (White, Philogene, Fine &

Sinha, 2009; Malmström, Sundquist & Johansson, 1999; Schulz, Israel, Williams, Parker, Becker & James, 2000; Jaipaul & Rosenthal, 2003). Therefore, a single item measurement of self-reported health-status has been used in this study as well.

Health awareness: This topic was requested by NFtK to be added to the online survey. They preferred some extra insights on this regard for their own purposes. They proposed three questions to measure this: “Has anyone looked at, or asked about your physical condition? (1) Yes – (2) No”. “Have you discussed anything regarding psychosocial help? (Help with stress, fear or a depression caused by your diagnosis) (1) Yes – (2) No”. “Have you received any advise regarding physical exercises, nutrition, relaxation and such? (1) Yes – (2) No”.

Satisfaction: According to Oliver (2006), measuring satisfaction can be done by both asking whether the hospital service has met one’s expectations, and whether one is content with the service. So in order to measure satisfaction of hospital patients the following question was incorporated in the survey: “To what extent has the hospital service met your expectations? (1) The hospital service has not met my expectations at all – (7) The hospital service has exceeded my expectations”, with 4 being neutral. “To what extent are you content with the hospital service? (1) Not at all content – (7) Very content”, with 4 being neutral again. Bhattacharjee and Premkumar (2004) also asked respondents “To what extent are you satisfied with the hospital service? (1) Not at all satisfied – (7) Very satisfied”, with 4 being neither dissatisfied, nor satisfied. The questions concerning contentment and satisfaction seem rather similar, but there is a difference: satisfaction is when one achieves what he or she wants, while contentment can occur when the goal is not achieved but he or she is still happy with the hospital service. Bhattacharjee and Premkumar (2004) also used a terrible-delighted scale, which according to Danaher and Haddrell (1996) is a very reliable scale. Based on this the following question was also incorporated in the survey to measure satisfaction: “How do you generally feel about the hospital? (1) Terrible– (7) Very good”, with 4 being neutral. “To

what extent are you happy having chosen this hospital? (1) Very unhappy – (7) Very happy”.

Control variables: In order to control for sociodemographic variation, respondents were asked to report their gender (male/female) and their age: 16–25 (code 1); 26–40 (code 2); 41–55 (code 3); 56–70 (code 4); 71–80 (code 5); 81 or older (code 6). In order to control for the time to travel to the hospital, respondents were asked: “How long does it take you, approximately, to get to the hospital? Less than 30 minutes (code 1); 30–60 minutes (code 2); 1–1.5 hours (code 3); 1.5v2 hours (code 4); 2v3 hours (code 5); over 3 hours (code 6)”. In order to control for the region of the hospital, respondents were asked: “In which region is the hospital located? Region North (Groningen/Friesland/Drenthe) (code 1); Region East (Overijssel/Flevoland/Gelderland) (code 2); Region South (Noord-Brabant/Limburg) (code 3); Region West (Noord-Holland/Zeeland/Zuid-Holland) (code 4); Region Utrecht (code 5)”. To control for the last time the respondent visited the hospital, respondents were asked: “When was your last (oncological) visit to the hospital? Less than 3 months ago (code 1); 3-6 months ago (code 2); 6-12 months ago (code 3); 12-24 months ago (code 4); over 2 years ago (code 5)”. Hospital experience and self-reported health status, measured as described above, were also used as control variables.

4. Results

This chapter contains the results after analyzing the data gathered by the online survey. First, a description of the sample will be provided. Second, some general insights about the main constructs will be presented. Third, the hypotheses will be tested. Finally, some interesting additional insights will be given.

4.1 Survey

In total, 198 respondents remained after deleting partially completed responses. 79.3% of these 198 respondents were female. This disproportion is partly due to a relatively high response rate of women with breast cancer opposed to other forms of cancer. Also, women tended to be more responsive in filling out the survey in all cases, opposed to men. Table B1 in the appendix displays the distribution of the sociodemographic characteristics of the sample. Table B2 in the appendix presents the average scores on the main constructs, being performance, disconfirmation and evaluability.

4.2 Evaluability

Table 1 shows the average easiness of evaluating the attributes. Quality of the results of treatment, quality of diagnostics and treatment, online ratings of the hospital/doctors, reputation, aftercare and recommendations seemed to be relatively difficult to evaluate.

Table 1*Distribution of attribute evaluability scores*

	Scores		Missing
	Mean	SE	N
Quality of the results of the treatment	3.56	(.159)	4
Quality of diagnostics and treatment	3.48	(.155)	4
Online ratings of the hospital/doctors	3.44	(.139)	5
Reputation	3.34	(.143)	5
Aftercare	3.31	(.147)	4
Recommendations (by friends, family, doctor, health insurance)	3.25	(.139)	7
Specialism of the hospital	3.13	(.144)	6
Information: good, sufficient and extensive	3.01	(.138)	4
Prior experience with the hospital	2.96	(.143)	10
Hospital Atmosphere	2.94	(.130)	5
Waiting time for treatment	2.92	(.138)	2
Waiting time for polyclinical appointments	2.89	(.134)	4
Reachability, parking and facilities of the hospital (e.g. restaurants, shop, seating areas)	2.58	(.131)	8
Costs of parking	2.37	(.116)	4
Distance to the hospital	1.93	(.076)	1

4.3 Hypotheses

4.3.1 Hypothesis 1

To test whether the relationship between positive (negative) disconfirmation and satisfaction is indeed positive (negative), regression analyses have been conducted. First, the five items measuring satisfaction have been averaged into one variable. With a Cronbach's alpha of 0.967, the satisfaction scale seems very reliable. Deleting one of the items did not result in a higher Cronbach's alpha. For the first regression analysis, the independent variables consisted of all attribute judgments individually. The regression coefficients of all hospital attribute performance and expectation disconfirmation variables are included in Table B3 in the Appendix. Perceived atmosphere, recommendations and distance performances were strongly and significantly associated with patient satisfaction ($p < 0.01$). Quality of diagnostics and treatment, information and aftercare were slightly less, but still significantly, associated with patient satisfaction ($p < 0.05$). For expectation disconfirmation only reputation expectation disconfirmation was strongly and significantly associated with patient satisfaction ($p < 0.01$), indicating that reputation exceeding expectations has a strong positive effect on patient satisfaction. Aftercare and distance were also significantly associated with satisfaction ($p < 0.05$).

For the second analysis, all attributes measuring expectation disconfirmation were averaged into one item. With a Cronbach's alpha of 0.958 the disconfirmation scale seems very reliable. Deleting one of the items did not result in a significantly higher Cronbach's alpha. The null hypothesis is that there is no positive relationship between expectation disconfirmation and satisfaction. A simple linear regression was conducted to predict satisfaction based on expectation disconfirmation. A significant regression equation was found ($F(1,196)=388.56, p < .000$), with an R^2 of 0.67 and a regression coefficient of 0.932.

Because the effect is significant, the null hypothesis was rejected and it can be assumed that there actually is a positive relationship between expectation disconfirmation and satisfaction.

4.3.2 Hypothesis 2

To test whether the effect of negative disconfirmation of expectations on satisfaction with the hospital is stronger than the effect of positive disconfirmation on satisfaction, two regression analyses have been conducted separating positive and negative disconfirmation as is argued in loss aversion theory (see Table 2). A smaller positive main effect of positive disconfirmation (0.044) than of negative disconfirmation (0.129) has been found (see Table 2 & Table B4 in the appendix; $p < .001$), confirming the loss aversion effect. When adding performance to the regression the results held up, except for the moderating effect of evaluability on performance. When adding evaluability as a moderator, the effects of both positive and negative disconfirmation were not significant and no loss aversion occurred. The moderated positive versus negative disconfirmation regression yielded the highest adjusted R^2 s (resp. 0.742 and 0.776).

Table 2

Regression of satisfaction on moderated attribute performance evaluations and attribute disconfirmation

Variables	Performance		Positive vs negative disconfirmation		Performance and positive vs. negative disconfirmation	
	Coeff.	SE	Coeff.	SE	Coeff.	SE
Constant	-2.034	0.602**	3.982	.408**	1.362	0.606*
Evaluability	0.241	0.135†				
Attribute Performance	1.171	0.075**			0.548	0.104**
Attribute	-0.003	0.001†			0.000	0.001

Performance*						
evaluability						
Positive attribute			0.044	0.005**	0.022	0.007**
disconfirmation						
Positive attribute			0.000	0.001	0.000	0.001
disconfirmation *						
evaluability						
Negative attribute			0.129	0.016**	0.088	0.017**
disconfirmation						
Negative attribute			-0.008	0.007	-0.010	0.006
disconfirmation *						
evaluability						
HospExp	0.118	0.050*	0.121	0.049*	0.122	0.046*
HealthStatus	0.078	0.041†	0.099	0.041*	0.083	0.038*
Age	-0.49	0.055	-0.041	0.057	-0.041	0.053
Travel time	0.067	0.064	0.018	0.062	0.038	0.058
Last visit	-0.021	0.048	-0.045	0.049	-0.032	0.046
Male	0.141	0.138	0.331	0.139*	0.237	0.131†
East ¹	0.366	0.111†	0.316	0.192	0.347	0.180†
South ¹	0.403	0.198*	0.339	0.193†	0.376	0.181*
West ¹	0.305	0.180†	0.154	0.177	0.214	0.166
Utrecht ¹	0.413	0.253	0.110	0.249	0.202	0.233
#Observations	189		189		189	
Adjusted R ²	0.732		0.742		0.776	

¹Default is North

** $p < 0.01$, * $p < 0.05$, † $p < 0.1$

4.3.3 Hypothesis 3

To test whether performance of easy-to-evaluate attributes of hospital service indeed had a stronger effect on satisfaction than difficult-to-evaluate attributes, a regression analysis has been conducted using evaluability as moderator as explained in chapter 2.7 by Eq.(2). The null hypothesis is that performance of easy-to-evaluate attributes of hospital service do not have a significantly stronger effect on satisfaction than difficult-to-evaluate attributes. For performance evaluations, the evaluability moderation effect was negative, but non-significant (See Table 2; $p < 0.1$). The negative correlation indicates that performance of easy-to-evaluate attributes of hospital service do appear to have a stronger effect on satisfaction than difficult-to-evaluate attributes, but the effect was slightly non-significant. Therefore, the null hypothesis can not be rejected and it can not be assumed that performance of easy-to-evaluate attributes of hospital service have a significantly stronger effect on satisfaction than difficult-to-evaluate attributes.

4.3.4 Hypothesis 4

To test whether experienced patients more easily view attributes as being easy-to-evaluate than novice patients, a Spearman's rho correlation analysis has been conducted (See Table 3). The null hypothesis is that hospital experience does not significantly affect how easily patients view attributes as being easy-to-evaluate. Hospital experience was measured using two questions in the online survey and are called 'HospExp1' and 'HospExp2'. HospExp1 measured the frequency of visits to the hospital in which the patient is/has been treated. HospExp2 measured how experienced the patient would score themselves. As can be seen in the table below, HospExp1 is non-significantly and negatively correlated with evaluability. HospExp2 is significantly and negatively correlated with evaluability. Both HospExp1 and HospExp2 correlate with evaluability like we expected based on our hypothesis. The more experienced a patient is, the easier they would view attributes as being

easy-to-evaluate. However, for HospExp1 this effect was non-significant, opposed to HospExp2, where the effect was significant. For HospExp1 the result is not significant, so the null hypothesis can not be rejected. For HospExp2 the result is significant, meaning that the null hypothesis can be rejected. Therefore it can be concluded that H4 can only be partially accepted and is dependent on which item measuring hospital experience is used.

Table 3

Spearman's rho correlation on evaluability and hospital experience

		Correlations		
			HospExp1	HospExp2
Spearman's rho	Evaluability	Correlation Coefficient	-0.027	-0.182**
		Sig. (2-tailed)	0.708	0.01
		N	198	198

** $p < 0.01$

4.3.5 Hypothesis 5

To test whether a higher self-reported health status of patients results in a higher overall satisfaction with the hospital, a correlation analysis has been conducted (See Table 4). The null hypothesis is that self-reported health status has no significant effect on the overall satisfaction with the hospital. As can be seen in table 4, the correlation between self-reported health status and satisfaction is significant and positive. A higher self-reported health status will thus result in a higher satisfaction with the hospital and vice versa. Since the correlation is significant, the null hypothesis can be rejected. Therefore, it can be assumed that a higher self-reported health status will result in a higher overall satisfaction with the hospital.

Table 4*Spearman's rho correlation on satisfaction and self-reported health status*

Correlations			HealthStatus
Spearman's rho	Satisfaction	Correlation Coefficient	0.171*
		Sig. (2-tailed)	0.018
		N	192

* $p < 0.05$ **4.3.6. Additional Analyses**

Apart from testing the hypotheses of this research some additional analyses have been conducted in order to gain some extra insights from the collected data.

4.3.6.1 Health awareness and satisfaction. To help NFtK gather additional insights from this research too, three questions regarding health-awareness have been added to the online survey as mentioned in Section 3.2. Table B5 shows the response to these questions. It can be concluded that in the majority of the cases, hospitals do tend to consider health-awareness of the patient before or during their treatment. To test whether or not health-awareness has an effect on the satisfaction of the patient a regression analysis has been conducted (See Table 5). The null hypothesis is that there is no significant relationship between Q19-20-21 and satisfaction. A significant regression equation was found ($F(13,176)=5.88, p<.000$), with an adjusted R^2 of 0.251. Because the effects are significant, the null hypothesis was rejected and it can be assumed that there actually is a negative and significant relationship between all three items and satisfaction. This means that a higher score on Q19-20-21 (which is answer 'no') results in less satisfaction with the hospital service and vice versa.

Table 5

Regression of satisfaction on Q19, Q20 and Q21

Variables	Coeff.	SE
Constant	6.337	0.822**
Q19	-0.568	0.213**
Q20	-0.668	0.208**
Q21	-0.507	0.206*
HospExp	0.080	0.086
HealthStatus	0.239	0.067**
Age	0.074	0.094
Travel time	0.099	0.108
Last visit	-0.049	0.081
Male	0.005	0.230
East ¹	0.150	0.326
South ¹	-0.133	0.325
West ¹	0.063	0.299
Utrecht ¹	0.266	0.428
#Observations	189	
Adjusted R ²	0.251	

¹Default is North** $p < 0.01$, * $p < 0.05$, † $p < 0.1$

4.3.6.2 Hospital experience and satisfaction. As was stated in Section 2.5, since easy-to-evaluate attributes ought to generate more satisfaction in JE, it can be argued that experienced patients would be more satisfied with the hospital service than novice patients. To test whether hospital experience positively affects satisfaction a regression analysis has been conducted (see Table 6). The null hypothesis is that there is no significant relationship between hospital experience and satisfaction. A significant regression equation was found ($F(10,179)=2.49, p<.001$), with an adjusted R^2 of 0.073. Because the effect is significant, the null hypothesis was rejected and it can be assumed that there is a positive and significant relationship between hospital experience and satisfaction.

Table 6
Regression of satisfaction on Hospital Experience

	Coeff.	SE
Constant	3.306	0.761**
HospExp	0.252	0.091**
HealthStatus	0.264	0.074**
Age	0.057	0.102
Travel Time	0.052	0.118
Last visit	-0.144	0.088
Male	-0.005	0.255
East	-0.057	0.356
South	0.051	0.360
West	0.132	0.331
Utrecht	0.422	0.469
#Observations	189	
Adjusted R^2	0.073	

¹Default is North

** $p < 0.01$, * $p < 0.05$, † $p < 0.1$

4.3.6.3 Demographics and satisfaction

Some regression analyses have been conducted in order to gain insights in the relationship between the demographics of the respondents and satisfaction. Regression analyses of satisfaction on gender, age and region did not yield any significant results. This means that gender, age and region played no significant role in predicting satisfaction.

5. Discussion

Several conclusions can be drawn from this research. The aim of this research was to gain insights into how expectation disconfirmation and attribute evaluability affect patient satisfaction in Dutch hospitals. Evidence has been found for a positive effect of expectation disconfirmation on satisfaction. In addition, negative disconfirmation had a larger effect on satisfaction than positive disconfirmation, proving loss aversion. Also when attribute performance was added to the same regression, the results held up.

A negative but non-significant effect of performance evaluation on satisfaction, mediated by evaluability, was found. Even though it was only slightly non-significant, for this research it can not be concluded that performance of easy-to-evaluate attributes of hospital service have a stronger effect on satisfaction than difficult-to-evaluate attributes. No moderating effect of evaluability on expectation disconfirmation was found. Additional analysis on evaluability provided evidence of patients who consider themselves to be experienced regarding hospitals more easily view attributes as being easy-to-evaluate than non-experienced patients. No significant effect on this matter was found for the frequency of visits to the hospital. A positive and significant effect of hospital experience and satisfaction was found, indicating that experienced patients would generally be more satisfied with the hospital service than novice patients.

Strong evidence has been found for a positive correlation between self-reported health status and satisfaction, implying that a higher self-reported health status of a patient results in a higher overall satisfaction with the hospital. Health-awareness and help regarding this topic from the hospital towards the patient has also been found to be significantly associated with satisfaction.

5.1 Main findings

The aim of this study was gain insight into how expectation disconfirmation and attribute evaluability effect cancer patient satisfaction in Dutch hospitals. Data has been collected via an online survey which was filled in by 198 respondents. A significant effect of expectation disconfirmation on patient satisfaction was found, even though it is possible that patients experienced cognitive dissonance (Festinger, 1957) or distortion of facts in favor of the hospital they were treated in (Svenson et al., 2009). Also, a stronger effect of negative expectation disconfirmation on consumer satisfaction than of positive expectation disconfirmation has been found. This finding is in line with the loss aversion theory (Kahneman & Tversky, 1979) and previous research of Mittal et al. (1998). Neumann and Bockenholt (2014) found that loss aversion is stronger for durable than non-durable and service products. This research indicates the hospital service to be a service product where loss aversion occurs. However, admittedly one of the greater pitfalls of this research is its lack of generalizability. First of all, data gathered for this research was only derived from Dutch cancer patients, limiting the international generalization of the results. Secondly, women and some forms of cancer are overrepresented while other forms are underrepresented. Only certain Facebook groups with specified types of cancer participated in this research. Since these Facebook groups make up the majority of the respondents, not every form of cancer is represented in the data. Furthermore, we did not find a moderating effect of evaluability on the relationship between disconfirmation and satisfaction, which could be caused by the relatively small sample size.

Even though a significant relationship between perceived performance and consumer satisfaction was found, no evidence was found confirming that perceived performance of easy-to-evaluate attributes have a stronger effect on consumer satisfaction than perceived performance of difficult-to-evaluate attributes, which was expected based on the evaluability

theory. One explanation could stem from the severity of the matter. The service covered in this research is one with serious implications for the lives of the patients. They are dealing with a life-threatening disease, and their overall satisfaction will merely depend on their health (i.e. being cured) rather than more trivial attributes of the service. Therefore, the more easy-to-evaluate attributes such as facilities of the hospital, distance, waiting time and costs might lose importance when patients are asked about their satisfaction with the hospital. Another explanation could be that most of the performance attributes used in this research were non-tangible, which is no surprise considering it is about a service instead of an actual product. However, earlier research mainly focussed on tangible products with obvious differences between easy- and difficult-to-evaluate attributes, for example a torn/new cover versus number of entries of a dictionary, or an overfilled small ice cream versus an underfilled large ice cream (Hsee & Zhang, 2010). Since this research used mostly non-tangible attributes, the difference between easy- and difficult-to-evaluate attributes might not be as obvious for patients as it would be with tangible products. This might have caused the absence of a difference of effect which was expected based on previous research.

Strong evidence has been found of a positive and significant effect of hospital experience on satisfaction. Only partial evidence has been found confirming that experienced patients more easily view attributes as being easy-to-evaluate than novice patients. No significant effect was found between the frequency of hospital visits and attribute evaluability. However, a significant correlation was found between how experienced the patient would score themselves and attribute evaluation. This difference of effect might be due to patients overestimating their experience, even though they have relatively few hospital visits. This way, patients who have relatively often visited the hospital still have trouble distinguishing easy-to-evaluate attributes from difficult-to-evaluate attribute because of the non-tangible nature of the attributes as explained above, causing no significant effect between frequency of

hospital visits and attribute evaluability. On the other hand, patients overestimating their hospital experience and knowledge about them might therefore score themselves too high on experience and too low on evaluability (relative to their actual experience and evaluability) which leads to a significant effect of hospital experience and attribute evaluability.

A positive significant correlation has been found between self-reported health status and satisfaction, suggesting that a higher self-reported health status goes with a higher overall satisfaction with the hospital. These findings are in line with earlier research of Covinsky et al. (1998), Young et al. (2000) and Hekkert et al. (2009), among others.

5.2 Implications

Since the majority of research on evaluability has been done in the laboratory, this research is relatively unique in showing the effects on consumer satisfaction in real life (cf. Levitt and List, 2008; Yan and Bao, 2018). Therefore, this research could have implications for Dutch hospitals. In this study, quality of the results of the treatment, quality of diagnostics and treatment, online ratings of the hospital/doctors, reputation and aftercare seem relatively difficult to evaluate by cancer patients. Distance, costs, reachability, ‘parking and facilities of the hospital’ and waiting time on the other hand seem relatively easy to evaluate. In this study, no evidence was found confirming that perceived performance of easy-to-evaluate attributes have a stronger effect on consumer satisfaction than perceived performance of difficult-to-evaluate attributes, implying that it is no use for Dutch hospitals to differentiate their strategies for easy- and difficult-to-evaluate attributes when coping with expectation disconfirmation.

Confirming the loss aversion theory in this study also has relevant implications for Dutch hospitals, as it is probably more efficient to prevent negative disconfirmation than striving for positive disconfirmation. This can either be done by managing expectations by giving sufficient and honest information, or by improving service attributes which have led to

negative disconfirmation often in the past. Finding out which attributes have previously led to negative disconfirmation could easily be identified by analysing complaints through the years or setting out some sort of survey among their patients. Both marketing activities and experience are able to form expectations for consumers (Robledo, 2001). Patients with a bad experience with a certain hospital might have lower expectations in the future. Advertising or word-of-mouth can influence expectations too, no matter the previous experiences. Organizations these days have a huge amount of data available to them and are able to derive useful information from it, possibly even enabling them to manage expectations.

5.3 Future research suggestions

This research was done based on cross-sectional data, but could possibly benefit greatly if replicated by a longitudinal study. Instead of measuring performance and comparing it with expectations in retrospect, like was done in this research, a longitudinal study could measure expectations before engaging in the service and measuring disconfirmation after. This would strongly enhance the validity. Since this research only contained cancer patients from Dutch hospitals, future research also could be done internationally to increase generalizability. People from other countries might have different expectations or might be satisfied easier than Dutch people, for example. Also, making sure that both genders and all forms of cancer are equally represented in the study would be useful for future research, since this study was mainly based on females and limited forms of cancer.

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Appendix A: Key attributes

15 most important attributes of a service based on previous literature (a.o.):

Attributes	Articles supporting it
(Online) Ratings	Varkevisser, van der Geest & Schut, 2012; de Cruppé & Geraedts, 2017; NFK, 2019
Costs (travel costs, parking costs, treatment costs)	Javalgi, Rao & Thomas, 1991; Bahadori et al., 2016; Abedi & Abedini, 2017; de Cruppé & Geraedts, 2017; Berkowitz & Flexner, 1981; Wolinsky & Kurz (1984); Lim & Zallocco, 1988; Akinci, F., Esatoglu, A. E., Tengilimoglu, D., & Parsons, A. 2004; Yang & Yoon, 2015; NFK, 2019
Distance	Varkevisser, van der geest & Schut, 2012; Javalgi, Rao & Thomas, 1991; de Cruppé & Geraedts, 2017; Bahadori et al., 2016; Abedi & Abedini, 2017; Berkowitz & Flexner, 1981; Boscarino & Steiber, 1982; Inguanzo & Harju, 1985; Akinci et al., 2011; Yang & Yoon, 2015; NFK, 2019
Reputation	Varkevisser, van der Geest & Schut, 2012; Marang-van de Mheen et al., 2011; Dijns-Elsinga et al., 2010; de Cruppé & Geraedts, 2017; Berkowitz & Flexner, 1981; Inguanzo & Harju, 1985; Akinci et al., 2011; NFK, 2019
Atmosphere	Marang-van de Mheen et al., 2011; Dijns-Elsinga et al., 2010; Bahadori et al., 2016; Berkowitz & Flexner, 1981; Yang & Yoon, 2015; NFK, 2019
Waiting time	Marang-van de Mheen et al., 2011; Dijns-Elsinga et al., 2010; de Cruppé & Geraedts, 2017; ZorgkaartNederland, 2017; Yang &

	Yoon, 2015; NFK, 2019
Quality	Javalgi, Rao & Thomas, 1991; de Cruppé & Geraedts, 2017; Marang-van de Mheen et al., 2011; Dijs-Elsinga et al., 2010; Berkowitz & Flexner, 1981; Boscarino & Steiber, 1982; Wolinsky & Kurz (1984); Inguanzo & Harju, 1985; Lim & Zallocco, 1988; Yang & Yoon, 2015; NFK, 2019
Reputation	de Cruppé & Geraedts, 2017; Javalgi, Rao & Thomas, 1991; Dijs-Elsinga et al., 2010; Inguanzo & Harju, 1985; Lim & Zallocco, 1988; NFK, 2019
Recommendation (by e.g. friends, relatives or doctor)	Javalgi, Rao & Thomas, 1991; Bahadori et al., 2016; Abedi & Abedini, 2017; de Cruppé & Geraedts, 2017; Inguanzo & Harju, 1985; Boscarino & Steiber, 1982; Wolinsky & Kurz (1984); NFK, 2019
Specialisation	Akinci et al., 2011; Javalgi, Rao & Thomas, 1991; Marang-van de Mheen et al., 2011; NFK, 2019
Hospital experience	Marang-van de Mheen et al., 2011; Dijs-Elsinga et al., 2010; Boscarino & Steiber, 1982; Wolinsky & Kurz (1984); de Cruppé & Geraedts, 2017; NFK, 2019
Information	Aggarwal, Bernays, Payne, van der Meulen & Davis 2018; Marang-van de Mheen et al., 2011; Yang & Yoon, 2015; NFK, 2019
Aftercare	Wilson, Lydon & Amir, 2013; NFK, 2019
Facilities	Dijs-Elsinga et al., 2010; Akinci et al., 2011; Boscarino & Steiber, 1982; Yang & Yoon, 2015; NFK, 2019

Quality = Quality of diagnostics and treatment and Quality of the results of the treatment

Appendix B: Tables

Table B1

Sample descriptions

	<i>Frequency</i>	<i>% of the sample</i>
Gender		
Male	39	19.7
Female	157	79.3
<i>Missing</i>	2	1.0
Age		
16-25 years	4	2.0
26-40 years	27	13.6
41-55 years	76	38.4
56-70 years	63	31.8
71-80 years	26	13.1
81 years or older	2	1.0
Region of hospital		
North (Groningen/Friesland/Drenthe)	20	10.1
East (Overijssel/Flevoland/Gelderland)	43	21.7
South (Noord-Brabant/Limburg)	40	20.2
West (Noord-Holland/Zeeland/Zuid-Holland)	81	40.9
Utrecht	13	6.6
<i>Missing</i>	1	0.5
Travel time to hospital		
< 30 minutes	122	61.6
30 – 60 minutes	58	29.3
1 – 1,5 hours	9	4.5
1,5 – 2 hours	7	3.5
2 – 3 hours	2	1.0
Last visit to hospital		
< 3 months ago	119	60.1
3 – 6 months ago	34	17.2

6 – 12 months ago	28	14.1
12 – 24 months ago	7	3.5
> 2 years ago	10	5.1

Table B2*Average scores on performance, disconfirmation and evaluability*

	Average scores		
	<i>Performance</i>	<i>Disconfirmation</i>	<i>Evaluability</i>
Hospital Atmosphere	5.853	5.646	2.943
Waiting time for polyclinical appointments	5.576	5.439	2.886
Waiting time for treatment	5.778	5.530	2.918
Quality of diagnostics and treatment	5.823	5.566	3.484
Quality of the results of the treatment	5.822	5.592	3.562
Specialism of the hospital	5.893	5.541	3.130
Information: good, sufficient and extensive	5.672	5.294	3.041
Aftercare	4.974	4.754	3.314
Reputation	5.822	5.408	3.337
Reachability, parking and facilities of the hospital (e.g. restaurants, shop, seating areas)	5.878	5.535	2.584
Costs of parking	3.984	4.046	2.371
Online ratings of the hospital/doctors	5.403	5.277	3.435
Recommendations (by friends, family, doctor, health insurance)	5.461	5.395	3.246
Prior experience with the hospital	5.618	5.399	2.957
Distance to the hospital	6.000	5.293	1.934

Table B3*Regression of satisfaction on attribute performance evaluations and attribute disconfirmation.*

Variables	Performance		Disconfirmation	
	Coefficient	SE	Coefficient	SE
Constant	0.015	0,514	1.320	0.540*
Atmosphere	0.235	0.062**	0.036	0.080
Waiting time for appointments	0.074	0.062	0.032	0.072
Waiting time for treatment	0.021	0.067	0.063	0.077
Quality of diagnostic/treatment	0.196	0.081*	0.097	0.087
Quality of the result of treatment	0.107	0.084	0.097	0.098
Recommendations	0,179	0.059**	0.109	0.091
Experience	0.041	0.050	0.125	0.081
Specialisation	0.048	0.070	-0.125	0.090
Online ratings	-0.054	0.060	0.093	0.077
Information	0.130	0.060*	0.046	0.087
Aftercare	0.095	0.040*	0.113	0.051*
Reputation	-0.090	0.066	0.233	0.087**
Distance	-0.138	0.052**	-0.136	0.053*
Facilities	0.011	0.048	-0.042	0.056
Parking costs	0.036	0.034	0.031	0.039
Hospital Experience	0.109	0.051*	0.059	0.059
HealthStatus	0.107	0.039**	0.138	0.046**

Age	-0.069	0.053	-0.204	0.064**
Travel time	-0.096	0.069	-0.101	0.076
Last visit	-0.020	0.046	-0.052	0.052
Male	0.147	0.130	0.458	0.154**
East ¹	0.211	0.186	0.428	0.219†
South ¹	0.241	0.187	0.302	0.219
West ¹	0.139	0.171	0.161	0.201
Utrecht ¹	0.166	0.236	0.120	0.280
#Observations	189		172	
Adjusted R ²	0.773		0.727	

¹Default is North

** $p < 0.01$, * $p < 0.05$, † $p < 0.1$

Table B4*Regression of satisfaction on the combined disconfirmation*

Variables	Coeff.	SE	Coeff.	SE
Constant	3.953	0.402**	1.359	0.621*
pnDiff	0.042	0.004**	0.021	0.006**
Xndiff	0.071	0.012**	0.048	0.012**
Performance			0.535	0.102**
HospExp	0.120	0.049*	0.111	0.046*
HealthStatus	0.103	0.040*	0.087	0.037*
Age	-0.040	0.056	-0.042	0.052
Travel time	0.018	0.062	0.038	0.058
Last visit	-0.029	0.047	-0.015	0.044
Male	0.358	0.137*	0.266	0.129*
East ¹	0.320	0.190†	0.348	0.178†
South ¹	0.327	0.191†	0.355	0.178*
West ¹	0.174	0.174	0.231	0.163
Utrecht ¹	0.137	0.247	0.233	0.231
#Observations	189		189	
Adjust R ²	0.743		0.776	

pnDiff = sum of positive and negative disconfirmation

xndiff = negative disconfirmation

¹Default is North** $p < 0.01$, * $p < 0.05$, † $p < 0.1$

The fact that pnDiff is significant implies that here is a significant difference between the effect sizes of positive and negative disconfirmation. Since the effect size of negative disconfirmation is smaller (0.042) than the effect size of positive disconfirmation (0.129), loss aversion is confirmed.

Table B5*Health-awareness frequencies*

		Yes		No	
		Frequency	%	Frequency	%
Valid	Has anyone looked at, or asked about your physical condition? (Q19)	141	71.2	57	28.8
	Have you discussed anything regarding psychosocial help? (Q20)	122	61.6	76	38.4
	Have you received any advise regarding physical exercises, nutrition, relaxation and such? (Q21)	102	51.5	96	48.5
Missing	System	0	0	0	0
Total		365	61.45	229	38.55

Appendix C: Survey

Patiëntentevredenheidsenquête

Start van blok: Standaard vragenblok

Beste heer/mevrouw,

Allereerst wil ik u hartelijk danken voor uw deelname aan dit onderzoek. Ik ben een vierdejaarsstudent Marketing aan de Radboud Universiteit in Nijmegen. Voor mijn afstuderen doe ik, in samenwerking met het Nationaal Fonds tegen Kanker (NFtK), onderzoek onder (ex-)kankerpatiënten naar de tevredenheid over het ziekenhuis waarin zij behandeld zijn/worden. De enquête zal ongeveer 5-10 minuten van uw tijd in beslag nemen. Er zal vertrouwelijk met uw gegevens worden omgegaan en de resultaten worden geheel anoniem verwerkt.

Uw bijdrage wordt zeer gewaardeerd! Alvast hartelijk dank voor het invullen van de enquête.

Met vriendelijke groet,

Sjors Peters

Einde blok: Standaard vragenblok

Start van blok: Performance

Hoe zou u de volgende aspecten van dit ziekenhuis beoordelen?

Ze er sle cht		Ne utra al			Ze er go ed	
1	2	3	4	5	6	7

Algehele sfeer in het ziekenhuis	
Wachttijd voor (poliklinische) afspraken	
Wachttijd voor behandeling	
Kwaliteit van diagnostiek en behandeling	
Kwaliteit van de uitkomst van de zorg	
Specialisatie van het ziekenhuis	
Informatie: goed, voldoende en uitgebreid	
Nazorg	
Reputatie	
Bereikbaarheid, parkeergelegenheid en faciliteiten in het ziekenhuis (denk aan: restaurant, shop, zitplekken)	
Parkeerkosten	

Hoe scoort het ziekenhuis in uw optiek als u kijkt naar de volgende aspecten?

	1	2	3	4	5	6	7
	Zeer slecht		Neutraal		Zeer goed		
Online beoordelingen van het ziekenhuis of artsen in dit ziekenhuis (op bijvoorbeeld www.zorgkaartnederland.nl)							
Aanbevelingen van het ziekenhuis (door vrienden, familie, dokter, zorgverzekering)							
Uw eerdere ervaring(en) met het ziekenhuis							
Afstand tot het ziekenhuis							

Einde blok: Performance

Start van blok: Disconfirmation

Hoe hebben de volgende aspecten gescoord in vergelijking met uw verwachtingen?

	Veel slechter dan verwacht		Neutraal	Veel beter dan verwacht		
	1	2	4	5	6	7
Algehele sfeer in het ziekenhuis						
Wachttijd voor (poliklinische) afspraken						
Wachttijd voor behandeling						
Kwaliteit van diagnostiek en behandeling						
Kwaliteit van de uitkomst van de zorg						
Aanbevelingen (van vrienden, familie, dokter en zorgverzekering) (lees: hoe scoort het ziekenhuis in vergelijking met de aanbevelingen)						
Uw eerdere ervaring(en) met het ziekenhuis (Lees: hoe scoort het ziekenhuis in vergelijking met uw verwachtingen op basis van eerdere ervaring)						
Specialisatie van het ziekenhuis						
Online beoordelingen van het ziekenhuis of artsen in dit ziekenhuis (lees: hoe scoort het ziekenhuis in vergelijking met deze beoordelingen)						
Informatie: goed, voldoende en uitgebreid						
Nazorg						
Reputatie (in hoeverre is deze waargemaakt)						
Afstand						
Bereikbaarheid, parkeergelegenheid en faciliteiten in het ziekenhuis (denk aan: restaurant, shop, zitplekken)						
Parkeerkosten						

Einde blok: Disconfirmation

Start van blok: Hospital experience

Hoe vaak bent u, naar schatting, om oncologische redenen (vanaf diagnose tot heden) naar het ziekenhuis geweest waarin u wordt/bent behandeld?

- Maximaal 5 keer (1)
 - 5 tot 15 keer (2)
 - 15 tot 25 keer (3)
 - 25 tot 35 keer (4)
 - 35 tot 45 keer (5)
 - 45 keer of vaker (6)
-

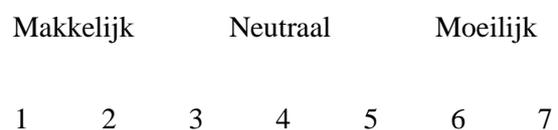
Hoe ervaren zou u zichzelf noemen wat betreft ziekenhuizen?



Einde blok: Hospital experience

Start van blok: Evaluability

In hoeverre vond u het makkelijk of moeilijk om de volgende aspecten van het ziekenhuis waar te nemen en te beoordelen?



Algehele sfeer in het ziekenhuis	
Wachttijd voor (poliklinische) afspraken	
Wachttijd voor behandeling	
Kwaliteit van diagnostiek en behandeling	
Kwaliteit van de uitkomst van de zorg	
Aanbevelingen (van vrienden, familie, dokter en zorgverzekering)	
Uw eerdere ervaring(en) met het ziekenhuis	
Specialisatie van het ziekenhuis	
Online beoordelingen van het ziekenhuis of artsen in dit ziekenhuis (op bijvoorbeeld www.zorgkaartnederland.nl)	
Informatie: goed, voldoende en uitgebreid	
Nazorg	
Reputatie	
Afstand	
Bereikbaarheid, parkeergelegenheid en faciliteiten in het ziekenhuis (denk aan: restaurant, shop, zitplekken)	
Parkeerkosten	

Einde blok: Evaluability

Start van blok: Self-reported health-status

Hoe gezond vindt u zichzelf?

Zeer ongezond Neutraal Zeer gezond

1 2 3 4 5 6 7



Is er gekeken naar, of heeft er iemand vragen gesteld over uw fysieke conditie?

- Ja (1)
- Nee (2)
-

Is er gesproken over psychosociale hulp? (Hulp bij stress, angst of bijvoorbeeld depressie als gevolg van uw diagnose)

- Ja (1)
- Nee (2)
-

Zijn er beweeg-, voedings-, ontspanningsadviezen en dergelijke gegeven?

- Ja (1)
- Nee (2)

Einde blok: Self-reported health-status

Start van blok: Satisfaction

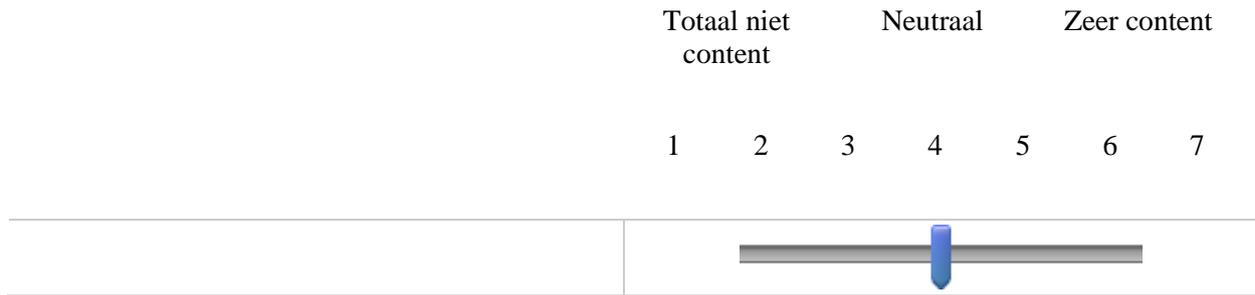
In hoeverre heeft het ziekenhuis aan uw verwachtingen voldaan?

Helemaal niet Neutraal Helemaal

1 2 3 4 5 6 7



In hoeverre bent u content met het ziekenhuis? (Lees: in hoeverre bent u tevreden met het ziekenhuis, los van het resultaat van de zorg)



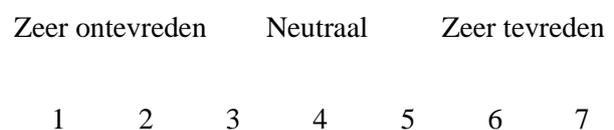
In hoeverre bent u tevreden met het ziekenhuis kijkend naar het resultaat van de zorg?



Wat is uw algehele gevoel wat betreft het ziekenhuis?



Hoe tevreden bent u met de keuze voor dit ziekenhuis?



Einde blok: Satisfaction

Start van blok: Demografie

Wat is uw geslacht?

- Man (1)
 - Vrouw (2)
-

Wat is uw leeftijd?

- 16-25 jaar (1)
 - 26-40 jaar (2)
 - 41-55 jaar (3)
 - 56-70 jaar (4)
 - 71-80 jaar (5)
 - 81 jaar of ouder (6)
-

In welke regio ligt het ziekenhuis waar u voor behandeling of nacontrole van de diagnose kanker komt? Komt u in meerdere ziekenhuizen? Ga dan uit van het ziekenhuis dat het eerste aanspreekpunt voor uw behandeling is. Gelieve de rest van de vragen te beantwoorden over dit ziekenhuis.

- Regio Noord (Groningen/Friesland/Drenthe) (1)
 - Regio Oost (Overijssel/Flevoland/Gelderland) (2)
 - Regio Zuid (Noord-Brabant/Limburg) (3)
 - Regio West (Noord-Holland/Zeeland/Zuid-Holland) (4)
 - Regio Utrecht (5)
-

Wat is ongeveer uw reistijd (van deur tot deur) naar dit ziekenhuis?

- Minder dan een half uur (1)
 - Tussen 0,5 en 1 uur (2)
 - Tussen 1 en 1,5 uur (3)
 - Tussen 1,5 en 2 uur (4)
 - Tussen 2 en 3 uur (5)
 - Meer dan 3 uur (6)
-

Wanneer was uw laatste (oncologische) bezoek aan dit ziekenhuis?

- Kortere dan 3 maanden geleden (1)
- 3 tot 6 maanden geleden (2)
- 6 tot 12 maanden geleden (3)
- 12 tot 24 maanden geleden (4)
- langer dan 2 jaar geleden (5)

Einde blok: Demografie

Start van blok: Blok 8

Heeft u nog tips/opmerkingen of zou u bepaalde dingen graag anders zien? Laat dit hieronder gerust weten!

Einde blok: Blok 8
