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CASE STUDY

Translating satisfaction determination from health care to the automotive industry

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Abstract This study is based on the case of BMW, and aims to improve the determination of perceived consumer satisfaction in the automotive industry by transferring existing knowledge from the health care sector. A literature analysis of the health care sector and the automotive industry was conducted to identify the common concepts of determining satisfaction. These were the service encounter, situational factors, and sociodemographics. The practical application was tested by analyzing a contemporary survey from BMW. Based on the findings, managers responsible for customer satisfaction in after-sales services in the automotive industry could improve measurement of customer satisfaction.

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1 Introduction

The time when success in a service industry was defined only by products and services is already history. Good products and services are no longer sufficient to survive in a tough competitive environment. Companies must now define themselves by consumer expectations (Dünzl and Kirylak 1997; Rao et al. 2006; Sivakumar et al. 2014; Yarris et al. 2012). In health care, a solid knowledge of patients' expectations, such as the information they want to receive and how, is the fundamental driver to satisfy patients even in critical situations (Leydon et al. 2000; Makarem and Al-Amin 2014). Transferring this phenomenon to service industries, the question arises: would applying the mechanisms for determining patient satisfaction help to improve customer satisfaction in, for example, the automotive industry? We ask how knowledge transfer could help to satisfy customers who experience service failures such as a repeat repair (Meinzer et al. 2010) and in general what and how the automotive industry can learn from the health care sector by transferring existing knowledge to new instances, problems, and domains. There is a high focus on personalized consumer treatment in health care (Blanchard et al. 1990; Laith and Feras 2011; Sun et al. 2000; Yarris et al. 2012) not least because of the potential consequences that can arise as a result of treatment. The knowledge of patients' expectations arises from well-defined questionnaires that help the health care sector to identify the most important satisfaction drivers and patient expectations. However, individual treatment is a key component to securing competitive advantage in every service-oriented business (Blocker et al. 2011; Zeithaml 1988). Using the metaphor of Hudak et al. (2003), treating patients as customers allows the transfer of insights into the determination of perceived satisfaction from the health care sector to the automotive industry. For example, transferring best practices from retailers to the health care sector has been done before (Blanchard et al. 2008). Cross-industrial translations of customer satisfaction and service quality models have made valuable contributions to the literature (Corbin et al. 2001). Corbin et al. (2001) compares service processes from the health care sector with other service industries such as Wal-Mart or McDonald's. They argue that every service process and customer treatment, such as patient–physician or customer–provider relationships, need to follow certain principles to create and secure customer satisfaction. According to Corbin et al. (2001), a cross-industrial

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knowledge transfer is possible for intangible goods as defined by Shostack (1977), such as service processes. Services are always related to customer treatment and, independent of the service industry, can only be evaluated after consumption (Bouman and Van der Wiele 1992; Corbin et al. 2001; Parasuraman et al. 1985), for example, using questionnaires. A patient with a health issue needs to be treated in the medical health care environment and consequently becomes a health care service customer (Hudak et al. 2003). In the automotive industry, a customer needs a service treatment such as a maintenance or repair visit (Bloemer and Lemmink 1992; Müller 1991; Tukker 2004). To make comparisons of these sectors meaningful, the car buying process, which is characterized as a highly tangible good because of the car as a product, has to be excluded for a greater focus on the intangible aspects of service processes in terms of car repair or maintenance. Intangible goods are given greater attention from a management perspective to increase the competitive advantage of their business (Stryja et al. 2015) and are the focus of this paper. They are used as the common construct for our cross-industrial comparisons. Similar approaches have been performed in the health care and retail sectors as shown above. A lack of research on service enhancement has already been identified in manufacturing industries, such as the car industry (Gebauer et al. 2008). Despite our best efforts, the existing research or established approaches for a cross-industrial translation from the health care sector to the automotive industry could not be examined in this literature review. We will close this gap by showing how to improve the determination of perceived satisfaction in the automotive industry using a questionnaire to show knowledge transfer from the health care sector based on the common denominator of intangible goods. We examine how to improve the determination of service satisfaction based on health care findings. The fundamental role of consumer treatment is well known in the health care sector (Hare et al. 2013), but has also been examined as a key concept to strengthen service businesses and secure competitive advantages, especially in the after-sales environment (Gebauer et al. 2008). After-sales services in the US industries generate an estimated revenue of 6–8 billion dollars annually (Gaiardelli et al. 2007) and generally after-sales service profit is higher than sales profit (ADL 2015). Consequently, the focus on implications for the after-sales services as intangible goods in the automotive industry based on findings from the health care sector in this work is considered as a new contribution to the existing research. Therefore, we follow the definition of treating patients as customers as described by Hudak et al. (2003). The main differentiation between the two sectors is the customers' independence in service selection. This independency is limited, especially in critical medical health care situations; therefore, the definition of patients as being customers is also limited. However, comparable service relationship constructs are present in this scenario, such as the customers' participation in a service (Bettencourt 1997). The better the interaction between service industries and its customers, the better the perceived experience and consequently the perceived satisfaction. This argument does not address situations where patients are no longer able to participate in the service relationship because of their poor medical conditions. Overall, the cross-industrial comparison of the health care and automotive industries is possible at a meta level for the customer treatment as an

intangible good. Comparable constructs such as service encounters or failures (such as waiting time) are equally relevant for all service industries to secure competitive advantages in satisfaction and loyalty (Chuang et al. 2012; Corbin et al. 2001; Reichheld and Sasser 1990; Sivakumar et al. 2014).

Taking the premium car manufacturer BMW as a representative example, the J.D. Power Survey results from 2013 and 2014 showed an increase in the Customer Service Index, but the company remains behind the luxury brand average (J.D. Powers 2013, 2014). BMW, however, is still the most valuable brand in the automotive industry, based on the Forbes ranking from November 2013 (Forbes 2013). We will examine how to improve determination of service satisfaction based on findings from health care. By identifying the most important determinants, based on an empirical analysis, we aim to improve understanding of customer expectations of a dealer service and hence to increase their satisfaction with BMW. BMW has a high focus on customer satisfaction, as the chairman of the board, Dr. Reithofer, has made clear (BMW 2014).

Our goal was to prove that the determination of perceived customer satisfaction in health care and the automotive industry is closely related. Currently, the importance of perceptions in the two sectors and the concepts to capture them are separately researched. Examining the similarities between the concepts for perceived satisfaction determination, our study will show the implications for the automotive industry that can be derived from the health care sector. This novel approach is proven by the case of the premium car manufacturer BMW.

The first section provides a theoretical background that shows the role and measurement of perceived satisfaction in service industries. The second part explains the conceptual framework, and sets out the most important concepts for the determination of perceived satisfaction in health care and the automotive industry, together with a literature review. To prove the findings from the literature empirically, Sect. 3 shows the results of a customer satisfaction survey from BMW. After summarizing the results, the paper explains the management implications of the new concepts for the automotive industry, and specifically for BMW. The paper closes with some limitations and ideas for further research.

2 Theoretical background

2.1 The role of satisfaction in general and for management

Customer satisfaction can be seen as one of the most important pieces of information for management decisions. Repeat purchase, brand loyalty, and willingness to pay are significantly affected by customer satisfaction (Churchill and Surprenant 1982). It is, therefore, a very important construct, which receives considerable management attention (Mittal and Frennea 2010).

Customer satisfaction plays an important role in establishing successful long-term customer relationships (Chojnacki 2000; Homburg and Rudolph 2001). Even if there is no common understanding of the exact relationship between satisfaction and loyalty, there is no doubt about its existence (Bennett and Rundle-Thiele 2004;

Blocker et al. 2011; Dong et al. 2011; Flint et al. 2011; Homburg and Giering 2001). Jones and Suh (2000) identified overall satisfaction to be the main predictor of loyalty. However, satisfaction does not linearly result in loyalty, which is why it is necessary to differentiate between these constructs (Kumar et al. 2013; Mittal and Lassar 1998).

Herrmann et al. (2000) found that customer price elasticity could be optimized as a result of customer satisfaction, resulting in a greater willingness to pay for products and services. Customer satisfaction also often leads to positive word-of-mouth recommendations to other consumers as a positive side effect (Mangold et al. 1999; Reichheld and Sasser 1990). Because such recommendations increase revenue, this aspect has high managerial relevance. The general impact of customer satisfaction on profitability and share-of-wallet has been proven by several studies, including Anderson et al. (2004) and Cooil et al. (2007). The Return on invest of a company is described as a function of customer satisfaction, strongly based on previous customer experiences (Anderson et al. 1994).

To maintain high customer satisfaction and thus create customer value, consumer orientation is identified as the most important management target (Blocker et al. 2011; Zeithaml 1988). Highly consumer-oriented processes were shown by Sun et al. (2000) to be main predictors of satisfaction. High customer understanding and knowledge of the key drivers of satisfaction are therefore important. Effective customer satisfaction measurement is vital to reach the desired outcomes mentioned at the beginning of this section.

2.2 The measurement of customer satisfaction and the importance of perceptions

The measurement and interpretation of perceived consumer satisfaction has long been an important field of research in the service industries (Anderson and Sullivan 1993; Herrmann et al. 2000; Homburg and Rudolph 2001; Huang and Dubinsky 2013; Mittal and Lassar 1998; Yarris et al. 2012). Perceived customer satisfaction expresses how well the services provided by companies meet customer needs (Anderson and Sullivan 1993). If services do not fulfill customers' expectation (disconfirmation), consumers may be dissatisfied (Anderson 1973). Consequently, expectations need to be fulfilled or exceeded to achieve the customer's confirmation and secure satisfaction (Anderson and Sullivan 1993). The relationship between customer satisfaction and expectations is known as the confirmation/disconfirmation paradigm (Anderson 1973; Anderson and Sullivan 1993; Churchill and Surprenant 1982; Oliver 1980). The importance of capturing the perceived performance is consequently highly relevant to measure satisfaction (Cheng and Yang 2013; Johnson and Fornell 1991) and is uncontroversial across different services and industries (Herrmann et al. 2000; Homburg and Rudolph 2001; Huang and Dubinsky 2013; Mittal et al. 1998; Rao et al. 2006; Rhee and Bird 1996; Trout et al. 2000; Yarris et al. 2012). Companies define a detailed understanding of customer needs as an essential factor in their competitive strategies (Anderson and Sullivan 1993; Herrmann et al. 2000). The consideration of service quality as one of the most

important antecedents of customer satisfaction helps service industries to establish a professional understanding of potential customer satisfaction drivers (Oh 1999).

Customer satisfaction and service quality are highly connected; therefore, it is helpful to define this connection. Three theoretical conclusions are discussed in the literature (Grönroos 1984, 2001; Hennig-Thurau and Klee 1997): that service quality and customer satisfaction are one and the same, that customer satisfaction is an antecedent of service quality or that service quality is an antecedent of customer satisfaction. The last approach is most popular (Caruana 2002; Cronin and Taylor 1992; Cronin et al. 2000; Grönroos 2001; Lee et al. 2000a, b; Wei et al. 2005; Xu et al. 2007) and the perspective taken in this study. However, a detailed understanding of the critical components of service quality is important for organizations to increase customers' perceived satisfaction (Seth et al. 2005) and their profitability (Zeithaml 2000). One of the most popular ways to measure service quality is by using the SERVQUAL scale (Parasuraman et al. 1988, 1991), which is widely used, including in recent studies (Jemmasi et al. 2011; Lee et al. 2000a) and the SERVPERF scale (Cronin and Taylor 1992). These two measurement scales can be seen as generic instruments (Randheer and AL-Motawa 2011; Rocha et al. 2013) to measure service quality as an antecedent for consumer satisfaction. In a review of various models, Seth et al. (2005) found 19 different approaches, which shows that various industries need to adapt service quality measurements, such as the retail industry (Sweeney et al. 1997; Teas 1993), hospitality sector (Mattsson 1992; Oh 1999), higher education (Spreng and Mackoy 1996), transportation industry (Frost and Kumar 2000), or the banking sector (Seth et al. 2005; Soteriou and Stavrinides 2000).

Comparable generic measurement batteries can be found for the determination of customer satisfaction. The most popular cross-industrial models are the American and European Customer Satisfaction Indices (CSI) defined by Gilbert and Veloutsou (2006), which comprise consumer expectations, perceived quality, and perceived value (Fornell et al. 1996). The CSI model is generally applicable to various sectors of the service industries and is produced annually to benchmark the considered companies. However, this cross-industrial assessment model is limited because the models need to be specified to continuously monitor processes and identify drivers for improvements in specific industrial sectors (Gilbert and Veloutsou 2006). For example, Deng et al. (2013) applied the American CSI to the hospitality sector by integrating consumption emotions, which resulted in the Hotel CSI. In addition, Hsu (2008) developed the e-CSI model for the online customer satisfaction determination and Kristensen et al. (2000) applied the European CSI to the Denmark Post by combining the generic measures with specific determinants from the post sector. A way to measure service features is the Customer Satisfaction Survey, which is related to transaction-specific service satisfaction (Gilbert et al. 1997). Service quality and various technical and functional service satisfaction measures are determined by this approach. Measuring the perceived quality of the complete consumption process is the scope of the Customer Satisfaction Barometer (CSB) based on Fornell (1992) and Hackl et al. (1996). Johnson and Fornell (1991) used the CSB as a standardized measurement battery for the general customer satisfaction, the perceived confirmation of customers' expectations, and the distance

to the ideal consumption result from the customers' perspective. Generally, cross-industrial customer satisfaction is defined as a function of pre-purchase expectations and post-purchase perceived performance.

Specifically for the health care sector, the most popular and standardized satisfaction and quality measurement approach is related to the Hospital Consumer Assessment of Healthcare Providers and Systems, which was established by the Centers for Medicare and Medicaid Services in 2008 (Giordano et al. 2009; Makarem and Al-Amin 2014; Rothman et al. 2008). A survey consisting of 16 questions assessing specific perceived aspects of care was established (Darby et al. 2005). These hospital ratings are public and accessible by the patients. However, the causes for satisfaction in the health care sector need to be analyzed in detail and specific cultural and demographical conditions need to be determined (Raposo et al. 2009). Therefore, specific questionnaires were developed to capture the relevant process information perceived by the patients. Exemplary surveys to measure perceived satisfaction in the health care sector can be found in the literature (Boudreaux et al. 2000; Jackson et al. 2001; Sun et al. 2000; Oliver 1980; Raposo et al. 2009; Westbrook et al. 1982).

3 Conceptual framework

To generate a thorough understanding of the effective determination of perceived consumer satisfaction, we examined the most important concepts and corresponding determinants in the automotive industry and the health care sector.

3.1 Concepts of customer satisfaction in service industries

3.1.1 The service encounter

The service encounter is considered the basis for building customer satisfaction (Gil et al. 2008), because this concept is one of the most important antecedents in customer evaluation of service performance (Brown and Swartz 1989; Parasuraman et al. 1985). Historically, service encounters were considered as a dyadic process of customer interactions (Solomon et al. 1985; Surprenant and Solomon 1987). The construct was defined as the way the service provider interacted with the customer, for example, in a face-to-face communication. Perceived personal interaction is most often studied in service encounters (Gil et al. 2008; Meuter et al. 2000) and especially as an antecedent of customer satisfaction (Bitner et al. 1990; Gil et al. 2008). Customized communication often helps to enhance the customers' relationship with service providers (Boulding et al. 2005). It is important to understand customers' expectations to optimize personalized information transfer (Ford 2001). From the customers' perspective, the basic event is the moment when they interact with a service provider (Bitner et al. 1994). Relational benefits result from customer–provider interactions, such as time savings due to the communication of waiting times (Gwinner et al. 1998; Reynolds and Beatty 1999). To capture personal

interaction during service encounters, it is important that both directions of communication between staff and consumers are recorded.

Beside personal interactions, service encounters also involve perceived processes and service characteristics (Bitner et al. 1997; Shostack 1985). It is the total workflow that defines customers' perception about the quality of service encounters and thus their satisfaction (Wynstra et al. 2006). A well-established customer interaction strategy has been identified as fundamentally important (Lindgreen et al. 2006). Personal customer interactions not only refers to service providers' interactions, but also to their delivery of services and goods (Brown and Gulycz 2006; Lindgreen et al. 2006). Therefore, for service encounters, we focus on personal interactions and perceived service characteristics.

3.1.2 Situational factors

Beside the service encounter itself, external factors may also influence perceived consumer satisfaction (Bagozzi 1978; Dabholkar and Bagozzi 2002; Lau and Ng 2001). These determinants may be defined by external influences, process-related circumstances in a service organization, or environmental conditions, and are described as situational factors. "Waiting time" or "perceived crowding" (for example, busy receptions in hospitals) are examples of these factors (Dong et al. 2008; Hui and Tse 1996; Nie 2000; Pruyn and Smidts 1998), which are described as being frustrating, stressful, and expensive when related to costs (van Dun et al. 2010). Underlying situations, such as "time pressure," significantly influence the individual perception (Blackwell et al. 1999; Hennig-Thurau and Klee 1997; Ravald and Grönroos 1996). Services that are perceived as convenient are likely to result in a higher degree of consumer loyalty and satisfaction (Blackwell et al. 1999). For specific consumer goods, situational factors also affect brand selection and impact. Some facility-specific determinants are also related to situational factors like the "location of a store" (Hennig-Thurau 2004). Lau and Ng (2001) examined the importance of the "proximity of others" as a significant factor that should be considered by service industries because consumers are more likely to talk about negative experiences, which may therefore affect reputation and satisfaction (Lau and Ng 2001; Mangold et al. 1999). There is a common understanding that inconvenient factors such as crowding or social anxiety decrease perceived service quality and thus consumer satisfaction (Dabholkar and Bagozzi 2002; Hui and Bateson 1991; Keaveney and Parthasarathy 2001; Maher et al. 1997). The internal climate of the organization may also affect consumers' perception (Yagil 2002), as can the "availability of goods" (Bloemer and Pauwels 1998).

3.1.3 Sociodemographics

In most studies, sociodemographic information was captured as a relevant indicator (Darley et al. 2008; Walker et al. 2003), with determinants such as age, sex, domicile, marital status, race, education level, and level of income. The determination of sociodemographics is considered particularly important for customer relationship models (Verhoef et al. 2003).

Currently, there is no common understanding about the relationship between the sociodemographic data and satisfaction. Some authors have shown that there is no significant correlation between sociodemographics and satisfaction (Boudreaux et al. 2000; Bursch et al. 1993; Hall and Press 1996). Others observed clear dependencies (Baker and Cameron 1996; Jha et al. 2008; Sun et al. 2000). A moderating effect of income on satisfaction and on the share-of-wallet was identified by Cooil et al. (2007). Homburg and Giering (2001) examined personal characteristics and found income, age, and variety seeking to be strongly influential factors of the satisfaction–loyalty construct. Customers have to be individually treated according to their age because satisfaction in younger people is highly influenced by service encounters, whereas older people's satisfaction is also based on previous experience. The role of education is important, because better educated consumers ask for more information to make their decisions, which is reflected in perceived satisfaction (Cooil et al. 2007; Keaveney and Parthasarathy 2001). Furthermore, the relationship between income and product satisfaction was identified as being weaker for people with high incomes than for those with low incomes (Homburg and Giering 2001).

3.2 Literature review of the customer satisfaction determinants in the automotive industry

Keaveney (1995) found that the two dimensions of service encounters, personal interactions and perceived service characteristics, are significantly important for the automotive industry. Brito et al. (2007) and Yieh et al. (2007) focused on the importance of customer interaction, defined as information transfer to the customer, and the reverse direction of information transfer was examined by Bloemer and Lemmink (1992). The most prominent determinants for personal interactions within service encounters were information about administrative issues such as waiting time or forthcoming steps (Bloemer and Lemmink 1992; Yieh et al. 2007) and the explanation of results and charges (Bei and Chiao 2001; Brito et al. 2007). With respect to the personal interaction between customers and service personnel, honesty and integrity were prominent in our literature review (Devaraj et al. 2001; Hünecke and Gunkel 2012; Yieh et al. 2007). Customer satisfaction with staff skills was the most significant determinant in perceived service characteristics (Brito et al. 2007).

Situational factors were examined as the second fundamental concept of perceived consumer satisfaction. The most important determinants are time-related factors, such as perceived waiting time or the length of stay (Devaraj et al. 2001; Müller 1991). Related factors include whether the car is ready at the promised time (Devaraj et al. 2001) and the ease of getting an appointment. Furthermore, the time to first contact has also been identified as a relevant factor (Yieh et al. 2007). The total time for servicing a car or for a repair was identified as being significant by Biehal (1983) and Müller (1991). The ability to do the repair correctly at the first service encounter is identified as being an important predictor of consumer

Table 1 Most important concepts and corresponding determinants for perceived consumer satisfaction in the automotive sector, identified from relevant literature

Author(s)	Most relevant determinants	Concepts	Empirical method	Comment/restrictions
Müller (1991)	Customer treatment Time for repair Perceived repair quality	Service encounters Situational factors	Survey analysis from 660,000 VW customers in Germany within 2 years	No detailed analysis of more determinants or empirical proof
Bloemer and Lemmink (1992)	Contact personnel Communication from customer to staff Dealer knowledge about the customer (business or private use) Sociodemographics	Service encounters Sociodemographics	Correlation analysis (partial correlation coefficients) of 416 questionnaires from different brands of one manufacturer in Japan	Differentiation between private and business use, since this is an important indicator for satisfaction
Jones and Sasser (1995)	Picking up cars at home and leaving loan car Follow-up contact Perceived repair quality (fix it right the first time) Cleanliness of the car	Service encounters Situational factors	Analysis of J.D. Powers results from 32 manufacturers	Only completely satisfied customers are highly likely to stay loyal
Keaveney (1995)	Pricing Inconvenience Response to failed service Competition Ethical problems Involuntary switching	Service encounters Situational factors Sociodemographics	Analysis of 526 interviews	

Table 1 continued

Author(s)	Most relevant determinants	Concepts	Empirical method	Comment/restrictions
Archer and Wesolowsky (1996)	Staff handling of critical incidents (failed repairs) Perceived repair quality	Service encounters	Logit regression model of 4500 questionnaires received from car owners from various Canadian branded dealers	One critical incident was found to have a much higher influence on the overall satisfaction than multiple positive visits
Bei and Chiao (2001)	Perceived service quality Price fairness Perceived product quality	Service encounters Situational factors	Analysis of 495 customers in 15 repair shops	Perceived product, services, and price were identified as equally important
Devaraj et al. (2001)	Age of customer Prior experience Perceived overall experience Choice of dealer in future Honesty and integrity Ability to do the job right Ability to do the job on time Ease of getting an appointment	Service encounters Situational factors Sociodemographics	Factor analysis followed by a path analysis on survey response from 504 car owners from one dealer	The authors also observed the influence of dealer data and found that warranty payment show a significant influence on satisfaction
Yu et al. (2005)	Overall evaluation of perceived quality experience Reliability experience Customization	Service encounters	Path analysis of 879 questionnaires received from Lexus owners	Customer expectation on perceived quality is also determined by pre-purchase perceptions of quality

Table 1 continued

Author(s)	Most relevant determinants	Concepts	Empirical method	Comment/restrictions
Brito et al. (2007)	Most important determinants by survey ranking (for branded dealers): Fix it right the first time Value of money service Staff trustworthiness Perceived skills Keep to schedule and promises Willingness to solve problems Equipment condition	Service encounters	Pure survey analysis and forward logistic regression of survey from 400 car owners	Differentiation between branded and independent repair garages
	Most important determinants by logistic regression: Employees' appearance Image of being reliable Equipment condition Facility appearance Staff interaction (response time) Value for money service Willingness to solve problems	Service encounters Situational factors		

Table 1 continued

Author(s)	Most relevant determinants	Concepts	Empirical method	Comment/restrictions
Yieh et al. (2007)	Friendliness of staff Time till first contact Explanation of repair requirements Price estimation Information about repair time Information about administrative issue (car return) Appearance of facility Perceived price fairness Perceived quality of parts provided by dealer	Service encounters Situational factors	Responses from 495 surveyed car owners, structural equation model	Perceived price fairness, perceived product quality, and employee–customer interaction where the most important antecedents of satisfaction Sociodemographics were captured but not analyzed
Hünecke and Gunkel (2012)	Honesty and integrity Fix it right the first time Friendliness of staff Staff knowledge Sociodemographics Country of residence	Service encounters Situational factors Sociodemographics	Path analysis of survey from 1500 car owners and service customers in three countries (France, Italy, and Spain)	After-sales satisfaction has no direct influence on loyalty. However, results differ in the three countries

Table 2 Most important concepts and corresponding determinants for perceived consumer satisfaction in the health care sector, identified from relevant literature

Author(s)	Most relevant determinants	Concepts	Empirical method	Comment/restrictions
Brody et al. (1989)	Patients that perceive that they have played an active role have higher satisfaction	Service encounters	Chi-square and *t* tests on questionnaires given to 117 patients before and after visit	Perception of patients and their role they play
Blanchard et al. (1990)	Perception that expectations are fulfilled Physicians' perceived behavior Emotional support received Communication	Service encounters	Path analysis of results from Physician Behavior Checklist conducted from 366 cancer patients	Identification of main predictors of overall satisfaction (OSAT) from cancer patients
Björvell and Stieg (1991)	Information delivered upon arrival	Service encounters	187 patients evaluated their perceptions of health care in a questionnaire	Focus on perceived patient care
Bursch et al. (1993)	Waiting time for first contact Perception of care Perceived skills of staff Information delivery	Service encounters Situational factors	Multiple linear regression of 258 telephone surveys of patients from an emergency department (ED)	Main determinants for satisfaction in ED
Mack et al. (1995)	Urgency of visit Ambulance use	Situational factors	Correlation analysis and multiple regression of 1316 mailed surveys	Focus on urgency of visit and staff interaction
Rhee and Bird (1996)	Perceived technical skills Perceived quality	Service encounters	Analysis of 618 telephone surveys conducted from patients 60 days after visit	Overall satisfaction and quality
Thompson et al. (1996)	Perceived waiting time more relevant than actual time	Situational factors	Univariate analysis of 1631 telephone surveys conducted with patients 2–4 weeks after visit	Only focus on waiting time
Yarnold et al. (1998)	Managing perceived waiting time Information delivery Expressive quality of entire staff	Service encounters Situational factors	Nonlinear tree models of 3564 mailed surveys from patients from an academic and a community hospital	Expressive quality most important
Carrasquillo et al. (1999)	Considering language barriers Perceived satisfaction decreases with impossibility of communication	Service encounters	Logistic regression and Chi-square tests of 2333 telephone surveys conducted with patients 10 days after visit	Focus on language barriers

Table 2 continued

Author(s)	Most relevant determinants	Concepts	Empirical method	Comment/restrictions
Boudreaux et al. (2000)	Perceived quality of the patients' treatment Perception of safety Quality of instructions	Service encounters	Logistic regression of 437 telephone surveys conducted with patients 10 days after visit	Most relevant determinants for OSAT and recommendation
Sun et al. (2000)	Willingness to return Communication to patients Responsiveness of staff	Service encounters Situational factors	Logistic regression of 2333 telephone surveys conducted with patients 10 days after visit in 5 EDs	Main determinants of OSAT
Jackson et al. (2001)	Sociodemographics (age, sex) Meet expectations Duration of presenting symptom Communication of causes Outcomes (need for repeat visit)	Service encounters Situational factors Sociodemographics	Logistic regression of 500 surveys conducted with patients immediately after visit and 2 and 3 months after visit	Focus on all aspects but reaction of patients when asked after different time intervals after their stay
Sun et al. (2001)	Receive help when needed Information about waiting time Information about diagnostic results Information about next steps Sociodemographics (age)	Service encounters Situational factors Sociodemographics	Logistic regression of 2373 mailed surveys conducted with patients from four different hospitals	Focus on patient satisfaction measurement
Walker et al. (2003)	Communication with staff Sociodemographics (especially young female patients) Attention of staff	Service encounters Sociodemographics	58 patients reported their perceptions of medical specialties in a questionnaire, which also asked for some sociodemographics	Focus on cancer patients
Jha et al. (2008)	Perceived clinical care Sociodemographics	Service encounters Sociodemographics	Chi-square and *t* tests on questionnaires given to patients from 4032 hospitals via Hospital Consumer Assessment of Health care Providers and Systems (HCAHPS) survey	Perception of hospital care

Table 2 continued

Author(s)	Most relevant determinants	Concepts	Empirical method	Comment/restrictions
Hekkert et al. (2009)	Age Health status Education of staff	Situational factors Sociodemographics	Correlation analysis of 66,611 mailed surveys conducted with patients from 22 different hospitals	Overall satisfaction
Pitrou et al. (2009)	Waiting time Total length of stay	Situational factors	Multivariate analysis of 146 telephone surveys conducted with patients 1 month after visit	Only focus on waiting time
Isaac et al. (2010)	Patient experience as an indicator to measure technical quality	Situational factors	Correlation analysis of service-line-specific data from 927 hospitals	Examine relationship between of HCAHPS and technical measures of quality and safety
La Vonne and Zun (2010)	Communication between physicians and patients Information about diagnostic results	Service encounters	Analysis of variance of 287 surveys	Focus on communication
Yarris et al. (2012)	Physicians' estimate of pain control Perceived length of stay	Service encounters Situational factors	Logistic regression of 242 face-to-face interviews conducted with patients before leaving the hospital	Estimation of patient satisfaction

satisfaction in the literature (Devaraj et al. 2001; Hünecke and Gunkel 2012). A defect that is not fixed during the first attempt is a service failure that may require a repeat attempt to be repaired. Samuels et al. (1983) were among the first to show the high rate of dissatisfaction with repeat auto repairs and their importance in this industry. Especially in the automotive sector, facility- or car-related situational factors were frequently captured by surveys, such as the appearance of the service area or cleanliness of the car (Jones and Sasser 1995; Yieh et al. 2007). Whether or not service use was voluntary (for example, car breakdown) has been identified as an additional important situational factor (Meinzer et al. 2010; Ravald and Grönroos 1996; Samuels et al. 1983).

In the automotive sector, sociodemographics such as sex have been identified as having a significant influence on satisfaction (Darley et al. 2008). This study found that women who perceived contact with salespeople as being positive were satisfied with different aspects of their service encounter. The distinction between private or business use was examined as a relevant determinant because value for money is closely related to the purpose of car use (Bloemer and Lemmink 1992). Cultural differences based on the country of origin were identified by Hünecke and Gunkel (2012). Devaraj et al. (2001) found that they needed to control for sociodemographics such as age and income to measure perceived satisfaction accurately. They found that older people were more satisfied with the service encounters than younger people were. It is useful for the automotive industry to examine these sociodemographics (Homburg and Giering 2001; Verhoef 2003) because they show an impact on perceived satisfaction.

The most important determinants for perceived customer satisfaction in the automotive industry are summarized in Table 1.

3.3 Literature review of the customer satisfaction determinants in the health care sector

In health care, determinants from service encounters such as the communication or information transfer between patients and clinical staff show the highest relevance because they are mentioned most frequently, as shown in Table 2.

The health care literature recommends starting with administrative information, and providing information about forthcoming steps (Björvell and Stieg 1991; Sun et al. 2001) or expected waiting time (Sun et al. 2001). Satisfaction with information delivery in general is often included in empirical surveys in the health care sector (Blanchard et al. 1990; La Vonne and Zun 2010; Sun et al. 2000; Walker et al. 2003; Yarnold et al. 1998). Providing an explanation of diagnostic results shows transparency about the patients' current situation and it was identified in the literature several times as predicting satisfaction (Jackson et al. 2001; La Vonne and Zun 2010; Sun et al. 2001). The fundamental role of patient interaction was examined by Andaleeb (1998, 2001), Brody et al. (1989) and Crawford et al. (2002), who considered how to involve patients in the process to improve their perceived outcome. Brody et al. (1989) demonstrated that patients need to play an active role to increase their service satisfaction. Bendall-Lyon and Powers (2004) described the importance of addressing and capturing service characteristics as perceived by

patients. Beside communication, other issues are captured by the literature, with perceived quality determinants leading the way (Boudreaux et al. 2000; Jha et al. 2008; Rhee and Bird 1996).

Situational factors are significantly relevant for the health care sector. The highest satisfaction is achieved if the waiting time is shorter than the consumer expects (Boudreaux et al. 2000; Sitzia and Wood 1997; Thompson et al. 1996) because waiting is a significant critical event, especially in urgent situations (Mack et al. 1995), and means a reduction in perceived quality (Pitrou et al. 2009; Sun et al. 2001). Thompson et al. (1996) examined the different effects of perceived and actual waiting time, and found that perceived waiting time was more important. This differentiation is also valid for the length of stay as another important situational factor (Boudreaux et al. 2000; Hall and Press 1996). Whether a visit was forced or voluntary was found to be highly significant, especially for health care (Dabholkar and Thorpe 1994). Time-related determinants are the most important predictor of perceived consumer satisfaction among the situational factors. They are highly prominent in the health care literature.

In most of the health care studies, sociodemographic information was captured by patient satisfaction questionnaires (Blanchard et al. 1990; Sun et al. 2000; Walker et al. 2003). Patient data such as age, sex, domicile, marital status, race, education level, and level of income are influencing factors (Venn and Fone 2005). Clear dependencies between these determinants and patient satisfaction were observed (Baker and Cameron 1996; Jha et al. 2008; Sun et al. 2000). Especially in critical events, language barriers may result in service failures due to failed communication, especially in health care (Carrasquillo et al. 1999). Thus, it is essential to capture sociodemographics when determining perceived consumer satisfaction in the health care sector.

The most significant determinants for perceived customer satisfaction in the health care sector are summarized in Table 2.

3.4 Conclusions from the conceptual framework

To generate a holistic overview about the concepts explained above, we carried out a full literature review. Tables 1 and 2 summarize the most prominent determinants for the determination of perceived consumer satisfaction in the automotive industry and the health care sector, according to the three concepts. To validate the determinants identified from the literature, the empirical methods, together with potential limitations, are listed. We reviewed 20 studies from health care and 11 from the automotive industry.

The key principle of this literature review was a systematic identification and consideration of the relevant studies and articles dealing with perceived satisfaction. Our search strategy was based on established procedures (Dickersin et al. 1994; Robinson and Dickersin 2002) using Ovid and PubMed. EBSCOhost was used for the literature review on the automotive industry. The search strategy was based on a three-phase algorithm. In the first search phase, satisfaction determination based on consumer perceptions was used as a key identifier to find articles that provide a general overview. This literature was reviewed for the specific perceptions

Table 3 Concepts, labels, and scales from the BMW survey

Concepts	Labels	Scales
Service encounter	SATISFACTION_SERVICE_ADVISOR*	1–10
	SATISFACTION_VALUING_SERVICE*	1–10
	RECOMMENDATION_PROB	0–1
	SATISFACTION_QUALITY_OF_WORK	1–10
	SATISFACTION_SERVICE_COMFORT	1–10
	INFO_DELAY**	0–1
Situational factors	LENGTH_OF_STAY	Individual
	SATISFACTION_CLEANLINESS	1–10
	READINESS_CAR_ON_TIME	0–1
	SATISFACTION_TIME_CASHIER	1–10
	SATISFACTION_APPOINTMENT	1–10
	SATISFACTION_ALTERNATE_TRANSPORTATION	1–10
Sociodemographics	DOMICILE**	Individual
Automotive specific	ALTERNATE_TRANSPORTATION_NEEDED	0–1
	REPAIRS_FIXED	0–1

* VIF value over 4.0; ** excluded from analysis

determining consumers' satisfaction. Those specific perceptions (for example, service encounters as key driver for satisfaction) were used as further identifiers for phase two. In the third phase, specific literature was identified to prove the specific hypothesis and gain in-depth understanding about specific issues. To improve the quality, we preferred highly ranked and frequently cited literature where possible.

The most often measured and analyzed concept in both sectors is the service encounter. In the automotive business especially, service encounters are strongly related to perceived quality and satisfaction because of the high levels of technical requirements, in terms of services and repairs (Yu et al. 2005). The second most frequently examined concept was situational factors followed by sociodemographics. To examine the most significant determinants for the automotive sector, we performed an empirical analysis on an existing survey from the German premium car manufacturer BMW.

4 Methodology: Empirical test of literature comparison

Service industries have a significant impact on the economic situation in the United States. Around 60 % of the annual gross domestic product (GDP) is from service industries and nearly 70 % of jobs (An and Noh 2009; McKee 2008). This section uses a survey from the automotive industry as a representative example for service industries to identify the need for action in determining perceived customer satisfaction. The most important determinants for the automotive industry are identified for each concept, employing a multiple linear regression, along with managerial implications.

Table 4 Results of the multiple regression analysis of the concepts and corresponding determinants

Concepts	Variables	Model 1[a] β	Model 2[b] β	Model 3[c] β
Situational factors	Constant	ns	−23.029***	−21.486***
	SATISFACTION_APPOINTMENT	0.285***	0.091*	0.090*
	SATISFACTION_TIME_CASHIER	0.307***	ns	ns
	READINESS_CAR_ON_TIME	0.164*	0.122***	0.120***
	SATISFACTION_CLEANLINESS	0.216**	ns	ns
	LENGTH_OF_STAY	ns	ns	ns
	SATISFACTION_ALTERNATE_TRANSPORT	ns	ns	ns
Service encounter	RECOMMENDATION_PROB		0.328***	0.346***
	SATISFACTION_SERVICE_COMFORT		0.184***	0.179***
	SATISFACTION_QUALITY_OF_WORK		0.398***	0.416***
Automotive specific	REPAIRS_FIXED			ns
	ALTERNATE_TRANSPORTATION_NEEDED			ns

R^2 final = .883; $p < 0.001$; *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

[a] $F(6,117) = 20.269$; $\Delta F = 20.269$***; $R^2 = 0.510$

[b] $F(9,114) = 94.491$; $\Delta F = 119.626$***; $R^2 = 0.882$

[c] $F(10,113) = 85.579$; $\Delta F =$ ns; $R^2 = 0.883$

Table 5 Results of the independent sample *t* test of the delay communication

Group	Delay communicated = yes		Delay communicated = no		*t* test	
Variable	Mean	SD	Mean	SD	*t*	*p*
Satisfaction	80.15	25.15	48.61	28.00	10.387[a]	0.000

[a] Unequal variances; *t* test corrected

4.1 Procedure and sample

We used an existing survey of BMW, an internationally operating premium automotive manufacturer. It determines customer satisfaction based on service visits in the United States. The questions were categorized into the three concepts identified from the literature review (service encounter, situational factors, and sociodemographics). A fourth concept defined as automotive-specific determinants captures the technical components of the survey.

We used survey data from 3219 car users in the United States who responded to a questionnaire between January and March 2011. For each question, either Likert-type scales from 1 to 10 (1 = *very low performance* to 10 = *very high performance*) or a binary coding (0 = no and 1 = yes) was employed. In total, 16 questions were asked that covered several categories of established processes a customer might notice during a service visit. The concepts, associated determinants, and scales are listed in Table 3.

4.2 Sample selection

The distribution of customers' domicile was very imbalanced in the survey responses. The influence of the sociodemographic factor *domicile* therefore could not be analyzed immediately. A stratified sample selection was conducted that normalized the results so that every domicile in the survey appeared relatively similar. The optimal sample size with a power of 0.99 was calculated to be $N = 379$ (Faul et al. 2007). The calculation of the power was based on the results of an F test, with an effect size of $f^2 = 0.1$, a significance level of $\alpha = 0.05$, and $\beta = 0.95$.

4.3 Analysis

Multiple linear regression models were calculated for the sample set to determine the relationship between the overall satisfaction and the various concepts and the corresponding determinants are shown in Table 3. To prevent multicollinearity, a variance inflation factor VIF value was calculated within the multiple linear regression. Determinants were only considered where the VIF value was below 4.0. The assumption of the normality of the error distribution in multiple linear regression (regarding the proper calculation of test statistics) is supported by the central limit theorem, which is especially true for larger sample sizes. Even for small sets of samples, multiple linear regression is very robust (Osborne and Waters 2002). Only one determinant within the service encounter concept captured the

information transfer: information about a delayed service. Because delaying the service of a car is a very infrequent event, the responses show a high number of missing values, making it necessary to exclude this determinant from the multiple linear regression and analyze its impact separately in an independent sample t test. Finally, 11 determinants were used for the regression analysis. In the multiple linear regression, each concept was analyzed separately to identify its impact. The analysis was conducted with SPSS Statistics version 20.0.

5 Results of the survey analysis

Table 4 shows the results of the multiple linear regressions, including the beta estimates. The F-change (ΔF) expresses the effect of the significance increase that results from the parameters added to the model. It shows the impact of an added concept on the overall satisfaction. The R-square describes the amount of total variance that is explained by the general model. Table 5 shows the results of the independent t test to identify the impact of the communication within the service encounters concept.

5.1 Impact of concepts on the overall satisfaction

The first model of the multiple linear regression covers the determinants that are considered to be situational factors (model 1). The six corresponding questions of the survey showed an increase of significance of $\Delta F = 20.269$ and a total amount of explained variance of $R^2 = 0.510$. Adding *service encounter* (model 2), the performance of the overall model increased significantly by $\Delta F = 94.491$ and resulted in a $R^2 = 0.882$. In model 3, the *automotive-specific determinants* were added, which showed a non-significant change of the overall model. All three models resulted in the best performance of $R^2 = 0.883$.

The highest variance of the dependent variable overall satisfaction was explained by model 2, the service encounter. The situational factors consolidated in model 1 were also significantly relevant for the overall satisfaction. The automotive-specific determinants in model 3 were not significant in explaining overall satisfaction. The only sociodemographic determinant used by BMW was the state of domicile of the customer. This parameter was used for the stratified sampling to secure an equally distributed sample, and it was therefore not possible to analyze it in its own right. To get a deeper understanding of the most important determinants, the models were observed in detail.

5.2 Impact of the determinants on overall satisfaction

To identify the most significant and thus important determinants for overall satisfaction, we analyzed the complete linear regression model, including all three concepts (situational factors, service encounter, and automotive-specific determinants), as shown in Table 3. The findings and key drivers for perceived overall satisfaction at BMW are covered below.

5.2.1 Model 1: Situational factors

The most important determinant of overall satisfaction among situational factors is the *satisfaction with the time needed at the cashier* ($\beta = 0.307$). The second most important issue is *satisfaction with the ease of getting an appointment* ($\beta = 0.285$). Both determinants are time related. They are followed by *satisfaction with the cleanliness of the car* after the service visit ($\beta = 0.216$) and the *readiness of the car on time* as promised by the dealer ($\beta = 0.164$). The length of stay of the car at the dealer and *satisfaction with alternative transportation* showed no significant results.

5.2.2 Model 2: Situational factors and service encounters

The second model included all determinants that correspond to the concepts of situational factors or service encounters. The *satisfaction with the time needed at the cashier* was no longer significant, and neither was *satisfaction with the cleanliness of the car*. The significance and importance of *satisfaction with the ease of getting an appointment* decreased to $\beta = 0.091$. The importance of the *readiness of the car on time* as promised by the dealer decreased as well, but was still the most significant determinant among the situational factors in this model ($\beta = 0.122$). The length of stay of the car at the dealer and the satisfaction with the alternate transportation still showed no significant results.

However, the additional concept of service encounters increased the significance of the overall model. The *quality of work performed* was the most important determinant in this model ($\beta = 0.398$), followed by the *willingness of the customer to recommend the dealer* ($\beta = 0.328$). The third most important determinant was also part of the service encounters, the *satisfaction with the service comfort* that is provided by the dealer ($\beta = 0.184$).

5.2.3 Model 3: Situational factors, service encounters, and automotive-specific determinants

The third model combined all the identified concepts in the questionnaire to explain the overall satisfaction. It had the highest value, as already identified and shown in Table 3.

The satisfaction with perceived service *quality of work performed* still showed the highest impact ($\beta = 0.416$), followed by the *willingness of the customer to recommend the dealer* ($\beta = 0.346$), and *satisfaction with the service and comfort* ($\beta = 0.179$). All three correspond to the concept of service encounters. From the situational factors, like model 2, the *readiness of the car on time* as promised by the dealer ($\beta = 0.120$) and the *satisfaction with the ease of getting an appointment* ($\beta = 0.090$) were most significant.

The automotive-specific determinants about whether *alternate transportation was needed* and if the *repairs were fixed* the first time showed no significant impact on the overall satisfaction in the linear regression model.

5.3 Impact of the communication of a delay on overall satisfaction

The only determinant within the service encounters concept that covered the communication between customers and staff was *information about the delay of a service*. As described earlier, it was necessary to analyze the impact of this determinant separately because it was an optional question, answered only if the car was not ready when promised. The information transfer showed significant influence on overall satisfaction, shown in Table 5. The results revealed a significant difference between customers who were told about the delay of the service before they went back to pick up their car (average satisfaction of 80.15) and customers who were not told about the delay beforehand (average satisfaction of 48.61). The impact of a delay and the timing of the communication therefore seem to be important determinants in controlling critical events.

6 Implications for the automotive industry based on the findings from BMW

In our literature review, we tested and confirmed the hypothesis that the determinants to capture perceived consumer satisfaction in health care are closely related to those in the automotive industry. They can be split into the same three concepts: service encounter, situational factors, and sociodemographics. However, analysis of the BMW survey shows potential for improvements to capture satisfaction. In the following section, we will examine how to make the necessary changes, and present the established benefits for this premium German car manufacturer based on the empirical and literature findings. The positive impact of an increase of consumer satisfaction on loyalty has already been identified for BMW (Walter et al. 2013).

6.1 Options for improvement for the service encounter concept

Managers working in the after-sales segment of the premium car manufacturer BMW should focus intensively on the communication between service advisors and the customer, because these determinants were identified as the most important for customer satisfaction. Our empirical analyses support the findings from our literature review, that service encounter is the most important concept to determine perceived consumer satisfaction because it shows the highest share of variance explained. At BMW, information about administrative issues and explanations of the results from the service is not currently covered by the survey. Especially in health care, these determinants are identified as significant predictors of perceived satisfaction. Therefore, BMW should capture this information to understand the most significant service process-related determinants. Willingness to recommend the dealer and satisfaction with service comfort were the second and third most significant items within this concept after the quality of work performed. Informed customers show much higher satisfaction levels. The significant impact of service failure and the effect of active communication are shown in Table 5.

Additionally, time-related service encounters are identified as highly relevant to prevent a decrease in satisfaction, for example, from having to wait. BMW already captures the communication of the delay and is therefore able to analyze the impact of this service failure. However, there is still room for improvement. The current time-related question is only asked if there is a delay. To understand how best to communicate any delays or additional waiting time, BMW should ask for customers' preferred communication channel. A personalized communication strategy could then be implemented, which is better for effective customer relationship management. The consequences of service failures at BMW, and the importance of capturing these, were shown by a case of delayed parts delivery that increased waiting times (Maier and Weiss 2013). BMW could also benefit from asking a question about satisfaction with explanations of the invoice.

Perceived value for money plays an important role in the automotive sector. Particularly if customers are paying for their own service or repair, BMW should focus on a detailed explanation of the charges. This item is currently captured in satisfaction with the value provided by the service, which provides important information about how well the company meets consumer expectations of value for money.

Based on our empirical analysis, the quality of work performed is the most important element of this concept, which matches the literature findings and our assumption that service quality is an antecedent of consumer satisfaction. BMW captures this information by asking about the quality of work performed, providing an insight into performance. They are also able to compare these findings with data received from other cars and dealers (IBM 2013; Meinzer et al. 2012b). Consequently, BMW should continue and try to extend these capabilities.

6.2 Implications for an improved measurement of situational factors

Situational factors have the second highest impact on the overall satisfaction in our empirical analysis. The most important determinants identified for situational factors are time related, with waiting time being the most prominent. The health care sector showed that waiting time is a critical factor in consumer treatment and needs to be seen as a service failure whenever it exceeds the customer's expectation. BMW captures this determinant in detail via questions about the readiness of the car when promised, the time with the cashier, and satisfaction with how long it takes to get an appointment. The readiness of the car on time was the most important determinant to measure the overall satisfaction in our empirical model. However, there is still room for improvement. From health care, we also learned that the waiting time until first contact is also significant. We therefore recommend asking about the waiting time after arrival as well, to cover the whole service process. In line with Thompson et al. (1996), we also suggest that BMW should differentiate between perceived and actual waiting time. The perceived length of stay is already captured in the survey, but did not show a significant impact in the linear regression model. An improvement could be achieved by differentiating between actual and perceived length of stay. This minor change would cover all the most important time-related items.

The perception of the appearance of service advisors and the service institution itself was considered important in our literature review, but did not show a significant impact on customer satisfaction. The BMW survey includes satisfaction with the cleanliness of the car. We would also suggest asking about the appearance of the service advisor and the dealership in general to understand whether this impact is important to perceiving consumer satisfaction.

6.3 Better customer understanding through the concept of sociodemographics at BMW

The only sociodemographic determinant currently included is the state of residence of the customer, and it was used as the basis for stratified sampling. Therefore, separately evaluating its impact was not possible. To customize consumer treatment, a more precise knowledge of their sociodemographics is needed. BMW may therefore need to find a way to include more determinants from this concept. Bloemer and Lemmink (1992) identified the dealer's knowledge about the consumer's car use, whether private or business, as a significant determinant. Currently, BMW can only get such information from their own business fleets or potential public sources. We recommend that this determinant be specifically included in the survey.

BMW should also capture the age and sex of their service consumers, which have been examined as significant determinants in our literature review. Such information would help BMW to steer their individualized customer treatment centrally and not only via the dealerships, which are currently the institutions that know the customers best.

BMW should also find a way to measure customers' preferred communication channels to improve the customer relationship management. Cooil et al. (2007) and Keaveney and Parthasarathy (2001) observed that better educated customers ask for additional information to support their decision making. Therefore, we recommend that this sociodemographic determinant be captured.

BMW should try to analyze more sociodemographic determinants, provided that their customers and dealers agreed to provide this information. The significance of sociodemographic factors in optimizing customer care is supported by the literature unequivocally, and is especially important for the after-sales processes in the automotive industry. Sociodemographics is certainly a critical concept to analyze from a data privacy perspective and it is therefore important to be aware of national policies.

6.4 Extending the capability to match automotive-specific determinants with internal BMW technical data

The BMW survey captures two automotive-specific determinants. Customers are asked whether they need alternate transport and whether the repair was done right the first time. The automotive-specific determinants did not show a significant impact in the empirical analysis. However, our literature review proved that knowledge about previous repeat repairs was essential because these are seen as critical events. Consumers were especially dissatisfied when their cars had a high rate of repeat repairs, defined as repairs caused by a similar technical problem or a

perceived identical cause (Biehal 1983; Kohl et al. 2011; Meinzer et al. 2010). The gap between perceived service failures such as repeat repairs and the technical image that BMW wishes to convey is particularly important (Meinzer et al. 2012b). BMW is already able to capture a huge amount of technical data, including warranty or diagnostic information (IBM 2013), which enable the measurement of repeat repairs in the technical data. However, the repeat repair rate from a customer's perspective is significantly higher than the measures based on warranty or diagnostic data (Meinzer et al. 2012b). Matching this automotive-specific determinant from the survey with the technical data transferred from the cars and the dealers, BMW is able to interpret technical measures from a customer's perspective (Meinzer et al. 2012a). BMW should extend these capabilities to those processes that are measured by internal key performance indicators with high customer focus. This would reduce the gap between technical, objective measures, and subjective customer-perceived feedback. An in-depth analysis about technical drivers for dissatisfaction could also be achieved.

7 Limitations and future research

In this article, we have provided an overview of the determinants that best measure the perceived consumer satisfaction in health care and the automotive industry. The results were derived from our literature review of both industries and an analysis of a survey conducted by the premium car manufacturer BMW and they confirm that findings from the health care industry can be adapted to the automotive industry. We have drawn out the practical implications, particularly the possible adaptations and improvements based on the health care findings. However, some important general limitations should be considered when interpreting our findings.

First, we chose BMW as a representative example of the automotive industry. The survey was an established questionnaire used to determine satisfaction. Further research should include surveys from other companies to broaden the understanding of our findings and to verify their generalizability.

Second, the survey was carried out in the United States and there may be significant cultural differences in other countries. Further research is needed to analyze survey results from other countries to test this. This consideration could be especially relevant for the automotive industry because car types and models, and consequently customer expectations, differ across and within countries.

Third, we only examined the applicability of the information transfer to the automotive industry. Further research should also consider other industries to investigate the generalizability of our findings for the service sector as a whole.

8 Conclusion

Our results demonstrate that insights about determination of patient satisfaction in health care can be transferred to the automotive industry. Three concepts were derived from the health care literature and analyzed for their applicability to the automotive

industry. These were service encounter, situational factors, and sociodemographics. This cross-sector knowledge transfer is possible because there are universally applicable determinants, which can be transferred from health care to the automotive sector. By transferring those determinants, it is possible to generate a description of status quo, detect drivers for change, and allow predictions of perceived satisfaction. This allows knowledge of the health care sector to be used by managers in companies in other industrial sectors. The automotive industry can enhance their determination of perceived consumer satisfaction by improving their established questionnaires. By adapting the presented approach, the missing determinants can be identified immediately. Therefore, all after-sales service processes can be monitored from the customers' perspective and be improved sustainably.

Compliance with Ethical Standards

Conflict of interest None of the authors of this manuscript has declared any conflict of interest which may arise from being named as an author on the manuscript.

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