*Primary research*

# Service quality and perceived customer value in community pharmacies

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**Abstract**

A patient's perception of the service provided by a health care provider is essential for the successful delivery of health care. This study examines the value created by community pharmacies—defined as perceived customer value—in the prescription drug market through varying elements of service quality. We develop a path model that describes the relationship between service elements and perceived customer value. We then analyze the effect of perceived customer value on customer satisfaction and loyalty. We use data obtained from 289 standardized interviews on respondents' prescription fill in the last six months in Germany. The service elements personal interaction (path coefficient: 0.31), physical aspect (0.12), store policy (0.24), and availability (0.1) have a positive significant effect on perceived customer value. Consultation and reliability have no significant influence. We further find a strong positive interdependency between perceived customer value, customer satisfaction (0.75), and customer loyalty (0.71). Thus, pharmacies may enhance customer satisfaction and loyalty if they consider the customer perspective and focus on the relevant service elements. To enhance benefit, personal interaction appears to be most important to address appropriately.

**Keywords**

client satisfaction, Germany, loyalty, pharmacists, prescribing

## Introduction

Pharmacies have a key role in delivering prescription drugs by ensuring proper distribution to the population. At the same time, through direct interaction with patients, pharmacies are faced with the managerial challenge of maintaining satisfaction when providing their services. Service elements, such as the attitude of the pharmacist or the attractiveness of the facilities, can influence the patient's perception of the purchase and, eventually, the choice of pharmacy. (Note: Mail-order pharmacies are not considered here. Hence, the word pharmacy has been interchangeably used with community pharmacies.)

In areas with high competition, pharmacies face a challenge to maintain their competitive advantage in providing high-quality service when dispensing prescription drugs. As customers may easily switch across pharmacies to fill their prescription in a number of health care systems, this challenge calls for managerial attention. Besides, the way in which patients perceive health care services is a major factor in the successful delivery of care and subsequent health outcomes. Including the patient's perspective as a humanistic outcome can improve service provision, increase help-seeking behavior, lead to higher adherence, or increase the customers' commitment toward the service provider.[1,2] Moreover, as some health care systems aim to provide special reimbursements for certain service elements provided in the pharmacy, such as consultation, analyzing variations in service quality is also important from a health system and a policy perspective.

The role of service quality for pharmacies to maintain a competitive advantage has been addressed in two respects: first, in developing measurement scales for service quality and customer satisfaction and loyalty;[3–9] and second, by linking these components to identify drivers of satisfaction and loyalty.[10–13,14] The studies that captured selected service elements or developed scales specific to pharmacies focused on the interpersonal relationship,

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consulting services, and the availability of the pharmacy in terms of location.[8,9,11–13,15] For example, Sakharkar et al. developed a combined scale for service quality in the hospital context.[7] For over-the-counter drugs, offering consultation services for US Medicare patients is shown to change purchasing decisions.[4] Clerfeuille et al. categorized four types of service segments that influence customer satisfaction and dissatisfaction and account for the location of the pharmacy depending on the customer's experience, as well as socioeconomic factors.[10] One instrument that has not been comprehensively considered is the SERVQUAL instrument, which has been widely used by marketers to determine service quality.[16] It allows the assessment of consumer expectations by multiple dimensions and identifies service areas that require managerial attention and action. Accordingly, as a first step, we investigate the role of selected service elements relevant for pharmacies in applying the SERVQUAL instrument and adopting the pharmacy context.

Linkages are also established between satisfaction and loyalty and important health system and customer characteristics. Lee at al. identified socioeconomic and health status as important determinants of satisfaction in Korean pharmacies.[3] Castaldo et al. showed that, if pharmacies manage to build trust between customers and pharmacists, higher satisfaction can help in establishing loyalty.[11] Thus, as a second step, we investigate the relationships between service elements and satisfaction, or satisfaction and loyalty.

We do so because it is still unknown how the various service elements can be linked with customer satisfaction and loyalty, as existing studies have focused on selected service elements relevant to pharmacies or have not comprehensively linked these with satisfaction and loyalty. Clerfeuille et al.[10] have categorized the many aspects of service elements available. How these service elements influence the value obtained through the pharmacy remains unknown. One important note is that these service elements are traded against each other in the customer's evaluation of the pharmacy. Using the concept of customer value that combines these evaluations in one construct may help to show variations in the influences of the service elements and their overall effect on satisfaction and loyalty. Thus, we aim to fill this gap by including a comprehensive set of service elements relevant to pharmacies to analyze their influence on the overall evaluation of the service provided in the pharmacy, expressed by the perceived customer value (PCV). Originating from marketing, the PCV derives from the domain of customer value models to explore the customers' perception of products or services and to analyze whether a company creates value from their customers' perspective by meeting their needs.[16] Another advantage of PCV is that not only the benefits created by a service are taken into consideration, but also the sacrifice required to access the service.[16] To the best of our knowledge, no study has considered PCV in the pharmacy context.

In this paper, we study the customer value created by the service provided in community pharmacies. In particular, we analyze the relationship between various service elements of the service delivered by the pharmacy, their influences on evaluations of PCV, and two outcome variables, customer loyalty and customer satisfaction. In a path model, we explicitly evaluate the influence of the service elements on service PCV and include perceptions of the quality and price of the drugs dispensed. We use the German prescription drug market, as pharmacies mainly differ in the quality of the service elements provided, which allows identification of variations in PCV.

## Research setting: Community pharmacies in Germany

We consider pharmacies dispensing prescription drugs in Germany as our research setting. Regulation provides an environment in which pharmacies mostly differ in the service elements provided, as dispensed products are homogeneous across pharmacies. Thus, we may perform an analysis of the service elements offered by pharmacies in isolation from other effects.[17] In 2012, approximately 21,200 pharmacies were in operation with a revenue of 42.6 billion euros.[18] Prescription drugs accounted for 82.1% of the total revenue of pharmacies.[18]

Most importantly, customers receive the same product across pharmacies when filling a prescription for the same price. A differentiation in co-payment is also not possible because of regulation. Thus, in our setting, pharmacies need to differentiate themselves through their service with limited possibility for economies of scale. As large chain-store pharmacies are banned and pharmacy ownership is limited to a maximum of four outlets, pharmacists are limited in the possibility of establishing trademarks and developing reputation by competing at the local level. Internet-based trade is of minor importance with 3% of the total drug market.[18]

## Path model

We reviewed the literature on relationship and service marketing, PCV, and service quality to describe the theoretical background, define constructs, and develop a conceptual model (see Figure 1). To account for service-intensive markets in business-to-consumer contexts, we further considered the literature on retail business and, in particular, pharmacies. We define a path model of the relationships between quality of service elements, PCV, customer loyalty, and satisfaction.

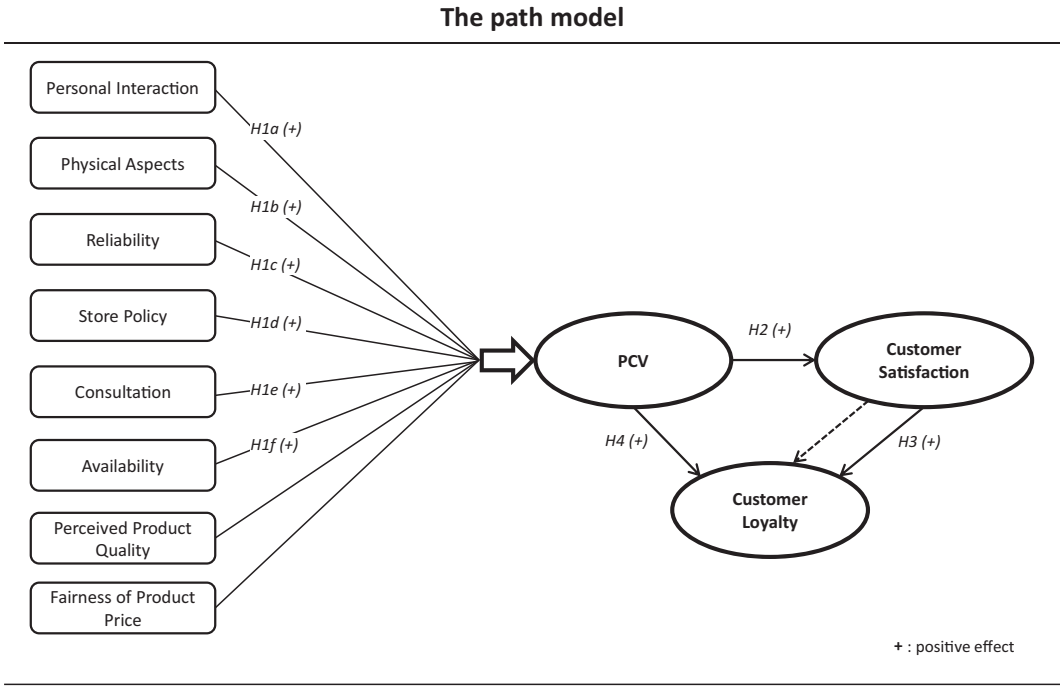


**Figure 1.** The path model.

## *Perceived customer value*

The PCV is the central construct of our path model and is based on the definition by Woodruff.[19] This enables us to analyze how customers evaluate the overall utility of a product or service, capturing the trade-offs between perceived benefits and perceived sacrifices.[20,21] Most importantly, customer value is regarded as a higher order goal that guides overall behavior.[22] Thus, it combines the evaluations of multiple components that comprise a service, for example, the location of the pharmacy.

In our context, we focus on the perceived benefits when filling a prescription drug to positively influence PCV, for example through consultations on side-effects and ease of accessing the pharmacy. In contrast, there are certain sacrifices in receiving the service provided that have a negative influence on PCV, for example when customers have to visit the pharmacy twice if the prescription drug is not available at the first visit.[21] The general marketing domain considers that the concept of PCV is essential to learn about customers and eventually gain a competitive advantage, as the subjective perception of product or service quality may deviate from the objective perception of the supplier.[23] Ideally, the PCV may be monetarized to compare costs of service provision with the pharmacy's revenues or, eventually, reimbursement by health systems for providing certain services in the pharmacy. However, monetarization is difficult as pharmacy customers typically only pay a share of the value of the true service and product price on account of co-payment schemes in health insurance systems.[23]

Thus, we focus on the PCV that is generated by a pharmacy's service. Customers' most important sacrifices are the effort and time involved in utilizing the pharmacy. We assume that pharmacies cannot influence the direct benefits and costs of the prescription drug as dictated by the regulatory environment, and therefore these should not vary among them. Further, we exclusively examine the post-purchase PCV, as evaluating the value of pharmacies before purchase is difficult for customers.

As perceptions of value may vary across customers and time, we focused on cross-sectional evaluations of PCV and exploited the variation across pharmacies. We further rely on the PCV instead of analyzing satisfaction alone, as we specifically accounted for the customer's perception of product price and the costs when evaluating the quality of service. These trade-offs are captured better by using PCV measures along with competitive considerations instead of analyzing the influences on satisfaction alone.[24]

Frameworks on the relationship between PCV and service elements describe PCV as a function of quality and price.[22,25] Perceived quality (composed of product-, service-, and promotion-related components) will positively impact value, whereas price (product price) negatively influences value. As high quality is not a prerequisite for value and may be offset by lower overall costs, the overall evaluation of these two components

conclude in the PCV.[26] Thus, the quality of service can be regarded as an antecedent of the PCV. Outside the pharmacy domain, the level of service quality has been shown to influence the PCV.[27,28]

### Quality of service elements as antecedents of PCV

We base our definition of service quality on the SERVQUAL instrument and the proposed measures of Dabholkar et al. that are specific to retail stores, and make some adjustments in the context of pharmacies.[16,29] Overall, pharmacies are similar to retail stores in the sense that customer experiences can be differentiated by in-store perceptions and the perceptions of the product purchased. Beyond that, consultation and availability are important additional aspects as pharmaceuticals are experience goods where customers seek expert information, and timely availability of the product is critical.

Generally, the quality of the service elements is defined as a result of comparison between customers' expectations of a service and the perceived way in which the service has been performed.[16] Objective quality offered by companies usually differs from the perceived quality experienced by customers, which ranges from ideal to unacceptable.[30]

In the original SERVQUAL study, Parasuraman et al. established a 22-item instrument, tapping five dimensions of service quality as: tangibles, reliability, responsiveness, assurance, and equity.[16] This framework of service quality "provides a basic skeleton, which can be adapted or supplemented to fit the characteristics or specific research need of a particular organization."[16] This scale is constructed to analyze retail businesses offering a combination of goods and services, and to identify necessary changes in the service provided. Despite its wide use across different service settings, the dimensions of service quality vary among industries.[31]

We used the version of the service quality concept defined by Dabholkar et al. that fits in the retail context to meet the peculiarities of the prescription drug market.[29] For this purpose, we screened the existing studies that dealt with service quality in pharmacies and mapped these to the SERVQUAL instrument. Table 1 shows the studies identified for the service elements. Similar to the approach of Clerfeuille et al.,[10] who identified heterogeneous effects by service elements, we specified separate constructs per dimension that all contribute to PCV. Compared with the proposed five dimensions of physical aspects, reliability, personal interaction, problem solving, and policy, we used six. We kept the four dimensions physical aspect, reliability, policy, and personal interaction, with a few necessary wording variations and item changes. Moreover, we added the dimensions availability and consultation as these are crucial elements of the service provided by pharmacies.[4,9,13,15]

Availability is considered by various researchers as a relevant service element.[36,37] For pharmacies, it is possible to obtain a competitive advantage by variation in the extent of pharmacies' opening hours, accessibility by usual means of transport, and location close to physicians' offices. We added consultation because of its importance during a pharmacy visit.[9,10] As health is an experience good and patients who purchase prescription drugs may face risks to their health, consultation is usually required and demanded. Besides, pharmacies are legally obliged to deliver consultation as part of their service. Patients depend on the expertise of health providers and the actions they take.[4,8–10,13] We integrated the SERVQUAL dimension problem solving into the constructs consultation and personal interaction, as exchange or return of a prescription drug is uncommon; any problems appear directly when interacting with the pharmacist.

Accordingly, as PCV is a function of quality and quality is composed of service-related components, we consider the six service elements as antecedents of PCV and state the following hypotheses:

H1a:Personal interaction has a positive effect on PCV.

H1b:Physical aspect has a positive effect on PCV.

H1c:Reliability has a positive effect on PCV.

H1d:Store policy has a positive effect on PCV.

H1e:Consultation has a positive effect on PCV.

H1f:Availability has a positive effect on PCV.

### Perceived product quality and fairness of product price as potential confounders of service quality

We further consider the perceived product quality, which results from consumers' judgment about a product's overall quality.[21] Like service quality, perceived product quality is highly subjective. Product price is considered as an extrinsic cue for product quality, but also as an indicator of sacrifice. Product price positively influences perceived product quality, as customers believe demand forces result in a natural product order on a price scale.[30] We consider the construct fairness of product price to capture perceived fairness of the co-payment paid.[38]

In traditional models, perceived product quality and product price are included as antecedents of satisfaction

**Table 1.** Operationalization of latent constructs.

| Construct | Service elements in the pharmacy context | Specification | Items | Item label | Source of item definition |
|---|---|---|---|---|---|
| Personal interaction | Briesacher and Corey,[32] Clerfeuille et al.,[10] Sabater-Galindo et al.[12] | Formative | Waiting time in pharmacy | PI1 | SERVQUAL |
| | | | Honesty of the consulting pharmacist | PI2 | SERVQUAL |
| | | | Politeness and kindness of pharmacist | PI3 | SERVQUAL |
| | | | Appropriate time spent on personal interactiona | PI4 | SERVQUAL |
| Physical aspects | Clerfeuille et al.,[10] Sabater-Galindo et al.[12] | Formative | The pharmacy had modern-looking equipment | PA1 | SERVQUAL |
| | | | Possibility for privacy and discretion | PA2 | Own specification |
| | | | Outside appearance of the pharmacy | PA3 | SERVQUAL |
| | | | Overall impression of the pharmacist | PA4 | SERVQUAL |
| | | | Cleanliness and tidiness of the pharmacy | PA5 | SERVQUAL |
| | | | Arrangement of the inside structure | PA6 | SERVQUAL |
| Reliability | Malewski et al.[9] | Formative | Trustworthiness of the pharmacist | R1 | SERVQUAL |
| | | | Dependability of the pharmacy | R2 | SERVQUAL |
| | | | Adherence to delivery dates | R3 | SERVQUAL |
| | | | Increased confidence by pharmacist's behavior | R4 | SERVQUAL |
| | | | Reliability of the pharmacist | R5 | SERVQUAL |
| Store policy | Castaldo et al.[11] | Formative | Large and satisfying range of non-prescription drugs, supplementary range and homeopathic products | SP1 | SERVQUAL |
| | | | Value-for-money ratio of non-prescription drugs and supplementary range | SP2 | SERVQUAL |
| | | | Extras, extra services, bonus programs and discounts, sufficient patient file and worthwhile customer card | SP3 | SERVQUAL |
| Consultation | Antunes et al.,[13] Armando,[8] Clerfeuille et al.,[10] Malewski et al.,[9] Nichol et al.[4] | Formative | Consulting in the pharmacy was helpful | C1 | SERVQUAL |
| | | | Individual recommendations were given by the pharmacist | C2 | SERVQUAL |
| | | | Everything was explained properly to me | C3 | SERVQUAL |
| | | | All of my questions were answered professionally | C4 | SERVQUAL |
| Availability | Clerfeuille et al.,[10] Malewski et al.[9] | Formative | Suitable business hours of the pharmacy | A1 | SERVQUAL |
| | | | Easy accessibility with transportation | A2 | SERVQUAL |
| | | | Accessibility during everyday life | A3 | SERVQUAL |

(continued)

**Table 1.** Continued

| Construct | Service elements in the pharmacy context | Specification | Items | Item label | Source of item definition |
|---|---|---|---|---|---|
| | | | Surrounding environment of the pharmacy | A4 | SERVQUAL |
| Perceived product quality | | Formative | Adverse reactions because of the last medication | PPQ1 | Fornell et al.[33] |
| | | | Satisfying last medication | PPQ2 | Own specification |
| Fairness of product price | | Formative | Acceptable amount of co-payment | FPP | Fahey[38] |
| Perceived customer value | | Reflective | Appropriate costs in relation to service received | PCV1 | Eggert and Ulaga[24] |
| | | | Appropriate effort and time to visit pharmacy in relation to service received[a] | PCV2 | Eggert and Ulaga[24] |
| | | | Pharmacy service compared to other pharmacies | PCV3 | Eggert and Ulaga[24] |
| Customer satisfaction | Clerfeuille et al.,[10] Castaldo et al.[11] | Reflective | Satisfaction with the service of the pharmacy | CS1 | Eggert and Ulaga[24] |
| | | | Satisfaction of the visit | CS2 | Eggert and Ulaga[24] |
| | | | Word-of-mouth advertising via patient | CS3 | Eggert and Ulaga[24] |
| | | | Room for improvement of the pharmacy[a] | CS4 | Eggert and Ulaga[24] |
| Customer loyalty | Clerfeuille et al.,[10] Castaldo et al.[11] | Reflective | Chance to revisit the pharmacy | CL1 | Gremler and Brown[35] |
| | | | In case of need, revisiting of pharmacy | CL2 | Gremler and Brown[35] |
| | | | Recommendation of the pharmacy | CL3 | Gremler and Brown[35] |
| | | | Encouragement of friends to visit pharmacy | CL4 | Gremler and Brown[35] |

[a]Item was negatively worded and recoded for analysis.

and PCV.[33] Customers consider product quality and product price when they evaluate the service that comes with the product as they decide whether they have received value for money. A positive effect of perceived product quality on PCV is described as "intuitive and fundamental to all economic activity."[33] Evidence suggests a negative effect of product price on PCV.[27] Thus, the effects of the other service elements may be biased by these two components. Owing to the regulatory setting, we assume that product quality and product price do not vary among pharmacies. Therefore, we do not expect a specific relationship between product quality, product price, and the PCV of the service. To account for possible lack of awareness of consumers or perceived fairness of product price, we include product quality and product price constructs to account for these potential biases.

We included perceived product quality and fairness of product price to directly influence PCV, although neither product quality nor price can be influenced by the pharmacy. However, customers may be unaware of the regulations; therefore, service and product quality are intertwined and thus may bias the influences from the dimensions of service quality. And, in a general context, product quality and product price are considered relevant factors in PCV.[25,30]

## *Customer satisfaction and loyalty as consequences of PCV*

We define customer satisfaction and loyalty as consequences of PCV. Satisfaction is achieved by disconfirmation of customers' expectations of products or services. Customers create an emotional reaction, which originates from the confirmation or disconfirmation of their expectations of a product or service and perceived performance.[39] Marketers consider satisfaction crucial for company success. If customers accumulate satisfaction, it positively influences customer loyalty and the customers' attitudes toward the company.[24]

Although some scholars use satisfaction as an antecedent of customer value, we introduce PCV into the

relationship of service quality and satisfaction to fulfill the purpose of adding sacrifice to the model.[40] As PCV is derived from the discrepancy between benefits and sacrifice, it is considered as a cognitive construct.[24,40] On the contrary, satisfaction is an affective and evaluating response.[41] The majority of studies consider customer value as an antecedent of satisfaction with a positive influence from customer value on customer satisfaction.[24,33] Accordingly, we propose the following hypothesis:

H2: PCV has a positive effect on customer satisfaction.

Indicators of loyalty are customers who recommend a service or patronize the provider frequently. Loyal customers repurchase the same product or service, despite situational influences and marketing efforts with the potential to cause switching behaviors.[39] Gremler and Brown define three indicators to determine loyalty for intangible products: (1) customers making repeated purchases; (2) customers possessing a positive attitude toward a provider; and (3) customers only using one specific provider for further business.[34] Loyalty is fundamental to increasing profitability as customer relationships during later transactions, for instance, are more likely to be profitable than early transactions.[41]

In the path model, we include a relationship between PCV and satisfaction and a direct effect of the two on loyalty. Customer satisfaction is considered to be one of the most important factors of loyalty despite ambiguous evidence. Although some scholars included satisfaction in the model,[27,31] others did not explicitly involve it.[21,30] And, whereas a few scholars suggest that satisfied customers are not enough to create loyal customers,[42] others show a strong relationship.[33] Additionally, the literature suggests a direct positive impact of PCV on customer loyalty. Accordingly, we state the following hypotheses:

H3: Customer satisfaction has a positive effect on customer loyalty.

H4: PCV has a positive effect on customer loyalty.

## Methods

### Survey, item, and construct measurement

Data on customer evaluations for the items in the constructs of our path model were not readily available in the setting we studied. Therefore, we developed a standardized questionnaire in which we based the item measurements (Table 1) on previous research. We made adjustments to match the pharmacy characteristics based on expert interviews and the related literature.

The survey was designed to ask individuals about their last prescription drug fill in a community pharmacy. To be eligible for the complete interview and reduce response bias, participants were required to have filled a prescription in the last 6 months. Throughout the survey, individuals were sensitized by several questions about this purchase and the specific pharmacy they used.

We measure transaction-specific customer satisfaction (instead of general overall satisfaction), which is derived from the pharmacies' performance in the past.[16,42] To measure loyalty, we account for purchase intentions in the same pharmacy and attitudinal loyalty toward the pharmacy. The final questionnaire consists of 40 questions that measure the items with a seven-point response scale (1 = strongly disagree; 7 = strongly agree).

### Data collection

The survey was performed in Hamburg, a German city with approximately 1.8 million inhabitants, between June and November 2013. Potential respondents were randomly approached by interviewers in the street in various areas of the city. Interviewers explained the scientific background of the study and the opportunity of winning a voucher to the value of 25 Euros as incentive for participation. Interviewers were trained to address individuals and perform the interviews consistently. The questionnaire was pre-tested to ensure that the conditioning on the last prescription and having only one pharmacy in mind worked and that respondents understood the questions correctly.

In total, we collected 315 questionnaires. Surveys were deleted if information about the endogenous constructs was missing. We performed a plausibility check by examining whether the participants talked continuously about the same purchase or pharmacy. The final sample included 289 interviews in which respondents reported a pharmacy visit. Table 2 shows the sample characteristics. The final data set may be provided by the authors upon request.

### Ethical considerations

Respondents were given full information on the nature of the study at the start of the questionnaire. Respondents could withdraw from participation at any time. Data were collected anonymously. The respondents' names were not captured.

### Path model

We estimated the path model by using partial least square path modeling (PLS-PM). This method is a prediction-oriented method, ideal for explaining the variance in endogenous latent constructs.[43] The algorithm maximizes the share of the variance that is explained for

**Table 2.** Sample characteristics.

| | | |
|---|---|---|
| Pharmacy visit information | | |
| No prescription fill in the last six months | n | % |
| Prescription fill within last six months | 269 | 87 |
| No prescription fill within last six months | 35 | 11 |
| Do not know | 5 | 2 |
| Last time visited pharmacy | n | % |
| <1 week | 48 | 15 |
| 1–3 weeks | 47 | 15 |
| 2–4 weeks | 73 | 23 |
| 1–3 months | 91 | 29 |
| 3–6 months | 51 | 16 |
| Do not know | 5 | 2 |
| Regular pharmacy visit | | |
| Respondent's preferred pharmacy | | 0.63 |
| Respondent does not have preferred pharmacy | | 0.37 |
| | n | Mean (s.d.) |
| Co-payment (including pre-payments) | 202 | 18.6 (62.3) |
| | n | Mean (s.d.) |
| Number of prescriptions in the same filling | 288 | 2.8 (2.56) |
| Pharmacy location was close to (seven-point likert scale) | n | Mean (s.d.) |
| Home | 288 | 5.01 (2.17) |
| Workplace | 262 | 3.23 (2.32) |
| Physician's office | 286 | 4.78 (2.22) |
| Shops that serve daily needs | 286 | 4.74 (2.17) |
| Pharmacy can be reached easily by (seven-point likert scale) | n | Mean (s.d.) |
| Foot | 282 | 5.02 (2.31) |
| Bicycle | 282 | 5.30 (2.18) |
| Car or other motorized vehicles | 282 | 5.17 (2.14) |
| Public transportation | 275 | 5.27 (2.16) |
| Taxi | 255 | 5.55 (2.09) |
| Respondent demographics | n | Mean (s.d.) |
| Age | 286 | 41.51 (15.24) |
| Sex | n | % |
| Female | 124 | 43.00 |
| Male | 165 | 57.00 |
| Type of employment | n | % |
| Full time employment | 127.9981 | 44.29 |
| Part-time employment | 37 | 12.80 |
| Self-employed | 24.9985 | 8.65 |
| Student | 43.0032 | 14.88 |
| In-firm training, re-training, apprenticeship | 7 | 2.42 |
| Not employed (unemployed, work in own household, pensioner) | 48.0029 | 16.61 |
| Other | 10 | 3.35 |
| Education | n | % |
| None | 1 | 0.36 |
| Junior high school | 16 | 5.47 |
| Secondary school | 79 | 27.37 |
| High-school diploma/vocational baccalaurate diploma | 83 | 28.83 |
| University degree | 110 | 37.96 |
| Insurance status | | |
| Statutory health insurance | 257 | 89.00 |
| Private health insurance | 32 | 11.00 |

the endogenous construct based on an iterative sequence of ordinary least square regressions. PLS-PM allows measurement of the interrelationships between latent constructs, using both reflective and formative constructs. The various service elements were measured as formative constructs, as suggested by a growing body of literature on measuring service quality.[44] Typically, the items of the service quality elements, such as availability and consultation in our case, help in forming the consumers' evaluations of quality instead of causing these evaluations. The constructs PCV, customer satisfaction, and loyalty were defined as reflective constructs.

For estimations in SmartPLS, data were standardized so that the mean of each item was 0 and the variance 1. We used the initial weight of 1.0, a path weight scheme, and maximum iterations were limited to 289. To obtain asymptotic t-statistics, we applied a bootstrapping procedure with 5000 samples. We addressed the quality of the formative measurement models by analyzing information about convergent validity, multicollinearity among indicators, significance of outer weights, and relevance of outer weights measures. Reflective measurement models were evaluated by their internal consistency, indicator reliability, convergence validity, and discriminant validity.

## Results

### Measurement models

The assessments of the formative and reflective measurement models suggested not rejecting the constructs measured (full evaluation provided in supplementary material). Overall, the formative measurement model estimates with their corresponding indicators were acceptable in terms of discriminant validity, collinearity among indicators, and significance of outer weights and loadings. These were the constructs personal interaction, physical aspect, reliability, store policy, consultation, availability, perceived product quality, and fairness of product price.

Overall, the reflective measurement model estimations were acceptable in terms of internal consistency, indicator reliability, convergent validity, and discriminant validity. These were the constructs PCV, customer satisfaction, and loyalty.

### Path model

In the path model, four of the six service elements had significant effects on PCV. Figure 2 shows the results for the standardized path coefficients, the corresponding significance levels, and the value of $R^2$ for the endogenous latent target variables.

In line with the hypothesized direction, the service elements personal interaction, availability, physical aspect, and store policy positively influenced PCV (hypotheses H1a, H1b, H1d, H1f) (Table 2). Personal interaction had the highest influence with a standardized path coefficient of 0.31 (p value $<0.001$), whereas availability had the lowest influence with 0.10 (p value $<0.013$). Physical aspect and store policy had standardized path coefficients of 0.12 (p value $= 0.023$) and 0.24 (p value $<0.001$). Consultation (p value $= 0.364$) and

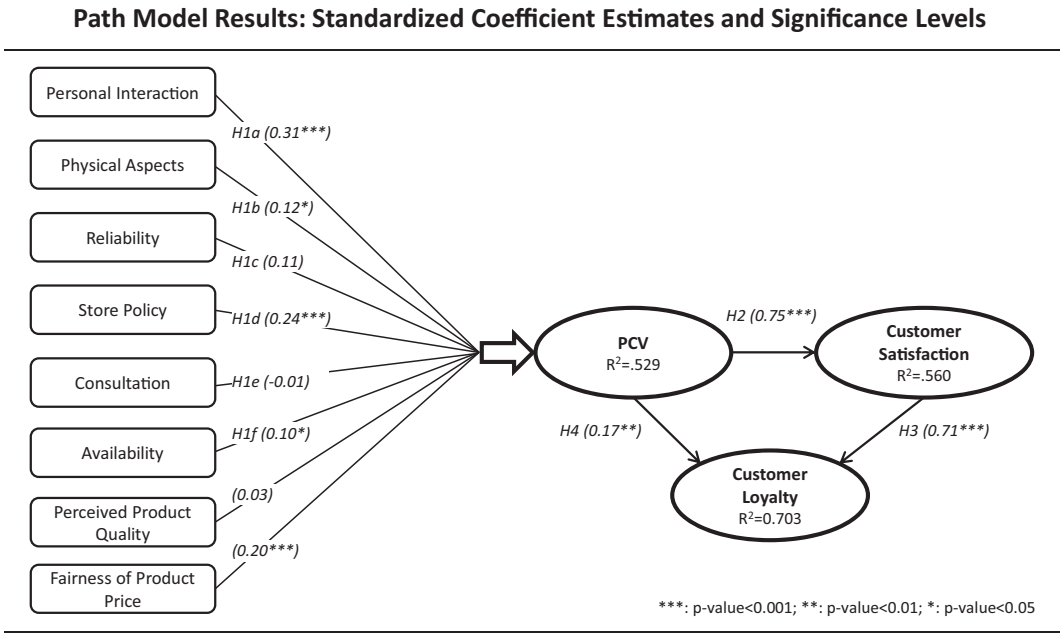


**Figure 2.** Path model results: Standardized coefficient estimates and significance levels.

reliability (p value = 0.080) had no significant effect on PCV.

For the constructs that control for potential bias in service quality by perceived product quality and price, we find that the construct of perceived product quality has no significant influence (p value = 0.209). However, perceived product price was positively associated with the level of PCV, having a path coefficient of 0.20 (p value <0.001).

PCV positively influenced customer satisfaction, supporting hypothesis H2. The path coefficient was 0.75 (p value <0.001). The path coefficients of 0.17 from PCV and 0.71 from customer satisfaction to loyalty were positive and significant, supporting hypotheses H3 and H4. The indirect path coefficient of PCV, through customer satisfaction, on customer loyalty was 0.53.

Evaluation measures of the endogenous constructs in our path model (i.e., PCV, customer satisfaction, customer loyalty) suggested that a substantial share of the variance is explained, as measured by $R^2$, and the predictive relevance of the exogenous constructs (Stone–Geisser criterion) is high (Table 2 and supplementary material).[43]

## Discussion and implications for management

The path model provides an understanding of the value created by the service offered in community pharmacies when dispensing prescription drugs. The influence of PCV on customer satisfaction and loyalty can help in comprehending the importance of the customers' perspective when generating competitive advantage in the role of the community pharmacy. Additionally, the results allow exploration of the influence of product quality and product price on PCV, despite the assumption of homogenous products and prices. Our results may be generalized to settings in which managers have discretion in the provision of the service elements provided and where competition between service providers is high or even increasing due to market liberalization activities. Besides Germany, examples are Italy or Sweden.[11] Outside Germany, many health care systems allow for single privately owned pharmacies similar to those analyzed in this study, which face increasing market concentration. Many also allow for larger chain-stores that could use our modified set of SERVQUAL parameters to compare the influences of their service quality on PCV, satisfaction, and loyalty between their outlets. As competition between pharmacies is typically strongest in densely populated areas, our approach may be transferred for analysis of customer behavior in other urban areas in particular.

The results suggest that pharmacists should consider the needs of patients when delivering their services. PCV not only strongly influences satisfaction, but also has a direct and indirect impact on the degree of loyalty. The strength of the path coefficients between the constructs is larger in comparison with non-health care-related industries that have heterogeneous markets in terms of product and price. For example, Liu et al. found a direct positive effect of PCV on satisfaction of 0.58.[45] Furthermore, the effect of PCV on satisfaction is stronger compared with other service-intensive industries such as hotels or restaurants.[31,46] This suggests the great importance of the customer perspective in pharmacies. Additionally, the share of the variance explained in the conceptual model is similar to that in other recent research.[46]

The strong influence of personal interaction on PCV underlines the importance of the relation between customers and pharmacists, as they want to feel valued and their perception strongly depends on factors such as politeness, kindness, or time exposure of employees. Store policy also has a big impact on PCV. Pharmacies' policies on factors such as product range, extra services, or free gifts influence perceptions. Physical aspects are also relevant. The community pharmacy's appearance in terms of visual and professional appeal including staff influences patients' perceptions significantly. Furthermore, the degree of availability is an important factor for PCV. The patients' perceptions about convenience and ease of reaching pharmacies for a purchase positively influence their PCV.

Against our expectations, the service elements of consultation and reliability had no influence on the level of PCV, although we found sufficient variation across pharmacies in our data (standard deviations for the items in the consultation construct ranged between 1.39 and 1.88, and in the reliability construct between 1.03 and 1.45). This is in particular surprising as the need for consultations is used as an argument to justify restrictions on pharmacy ownership in Germany. One explanation is that customers may believe they already have sufficient information, most importantly from the prescribing physician, such that the information provided by the consulting service in a pharmacy is not perceived as important. This finding is similar to evidence on the availability of quality report cards for selecting health care providers, which do not change enrollment as in managed care organizations.[47] Reliability may not be important for the PCV as overall customers' trust in market regulations and controls is high. Thus, pharmacists' skills are provided at a sufficiently high level such that severe consequences are not expected.

Another unexpected result is that the fairness of the product price has a positive influence on the PCV. Although pharmacies cannot influence the product

price, it appears that PCV increases when patients perceive the price of the prescription drug to be fair. This finding may result from lack of awareness of the regulations. Perceived product quality in this context had no influence on the degree of PCV, suggesting that patients may connect side-effects or unsatisfactory drug treatment with the prescription decision by the physician or the active ingredient, but not the pharmacy service.

Thus, pharmacies may enhance customer satisfaction and loyalty if they consider the customer perspective and focus on the relevant service elements. To enhance benefit, personal interaction appears to be most important factor to address appropriately. Staff who treat customers such that they feel appreciated should be one focus of the efforts. The pharmacy location should also be easily available and convenient to customers.

Addressing the physical aspects of the store not only influences customers positively but also employees, so that an improved physical environment has an additional advantage. An improved physical work environment for employees may, for example, increase job satisfaction or reduce intentions to quit employment.[48] Because our results suggest that store policy increases PCV, pharmacies could segment customers by their needs, as elements of extra services such as free samples need customization.

The product price or improved perceptions as to whether the price is perceived as fair cannot be neglected, even if the price of co-payment does not vary across pharmacies. To avoid disadvantages from products where the fairness of the price is perceived to be low, pharmacists should try to address this issue. For example, pharmacists could educate customers about regulations on prices even if the price cannot be influenced by them. Vice versa, perceived product quality in this regard is of less relevance as needing to be addressed in the sales situation.

The model demonstrates variations in the associations of the single service elements with PCV. If pharmacists wanted to evaluate the service quality of their own business, using the PCV alone for measurement may not provide a complete picture of the channels that finally influence the consequences of PCV, i.e., satisfaction and loyalty. Thus, the modified version of SERVQUAL that we have introduced in this study may be used as a tool to identify which service elements may be improved to attain a competitive advantage.

The study results also have implications for health policy to eventually reward services that improve customer satisfaction and loyalty. If services that meet the needs of patients increase the likelihood of patients maintaining the relationship with the service provider, this contributes to efficient health care, which may be valued by health systems. As we found no evidence that consultation is valued by patients, policy makers need to be careful when (partly) justifying regulation upon the argument.

## Limitations and further research

Our study is subject to several limitations. First, our study is based on single-respondent surveys, such that the ratings of PCV, customer satisfaction, and loyalty may be susceptible to common method bias.[49] However, we aimed to minimize bias by relying on established scales, particularly the SERVQUAL scale. Second, it is likely that the influence of PCV on customer satisfaction and loyalty may be lower in rural areas compared with pharmacies in urban areas (the location of our survey) because of reduced choices between pharmacies, and thus reduced competition. Third, the study is restricted by the sampling technique, as we used a convenience sample. This can lead to under- or over-representation of particular groups within the sample. Thus, we cannot control for the reasons why individuals agreed to participate in the survey. Fourth, our sample is not representative of the German population. We found the same proportion of people insured by statutory health insurance compared with private health insurance. However, respondents differed by age and gender. The average sample age of 42 years was slightly below the national average of 46 years in Germany in 2013.[50] Women were also somewhat under-represented at 43% compared with 52% nationally.

Finally, using PLS-PM has some limitations. A measure for the overall model fit does not exist, as there is no global optimization criterion. Also, PLS-PM does not impose any distributional assumptions.[43] This leads to using prediction-oriented, non-parametric evaluation criteria and resampling procedures for the evaluation of model adequacy. Besides, PLS-PM tends to underestimate path coefficients and overestimate loadings. However, because of the rather conservative calculation methods, the significant results obtained tend to be more credible.

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