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ORIGINAL EMPIRICAL RESEARCH

Customer positivity and participation in services: an empirical test in a health care context

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Abstract Many service interactions require customers to actively participate, yet customers often do not participate at levels that optimize their outcomes, particularly in health care. To gain insight into how customers shape a service experience with highly uncertain outcomes, we construct a model on the broaden-and-build theory of positive emotions. The model is used to empirically assess how situation-specific emotions and customer participation *during* a health care service experience affect perceptions of the service provider. The model is tested using data from 190 medical clinic customers. Consistent with theory, results reveal that as customers' relative affect levels become more positive, levels of participation increase as well. In turn, higher levels of positivity and participation improve customer perceptions of the quality of the service provider and satisfaction with the co-produced service experience. Implications of this research focus managers on designing services to help clients manage their emotions in ways that facilitate positivity and participation and thus improve service perceptions.

Keywords Customer participation · Service quality · Customer satisfaction · Professional services · Broaden-and-build theory of positive emotions · Value co-creation

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Introduction

Customer participation in health care is critical to shaping the process and outcomes of a service encounter (Hausman 2004). Encouraging the patient to share relevant information—including current status, desired outcomes and goals, and comfort with risk—are of particular importance in co-creating a valuable customer experience. Although physical presence is required in complex, interpersonal, human-contact service operations, mere presence often is insufficient to maximize the value of a service experience. In health care, patients are expected to participate through provision of their physical being, as well as by providing information on their condition, how they feel, and their preferences for particular treatment options.

However, there is significant variance in the amount of participation that customers apply, and the optimal level may not always be reached. For instance, researchers have found variance in customer participation levels in health care services (Cegala et al. 2007; Street et al. 2005). Variation in health care participation exists in part because customers are in an anxiety-producing situation, facing significant uncertainty and risk. This service context may lead to conditions in which customer participation levels are inhibited rather than enabled (Hibbard 2009). For instance, research has found that only one-third of medical patients

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engage in authentic, responsible, communicative roles during health care consultations, with the majority of encounters defined as "biomedical" and verbally dominated by the physician (Collins et al. 2007; Roter 2000).

In response to this challenge, public service announcements (PSAs) from the U.S. Department of Health & Human Services urge patients to communicate with their health care providers as much as they do with servers at restaurants or with salespeople at cell phone stores (Agency for Healthcare Research and Quality 2011). Although it seems reasonable to assume that patients routinely participate by sharing information during medical consultations, the reality is that patients often do not contribute at levels that are critical for positive outcomes or that are desirable from a service manager's perspective (Cegala et al. 2007; Street et al. 2005).

One potentially critical influence on levels of participation is the emotional state of the customer (Price et al. 1995). However, too few organizations strategically design customer experiences to account for, and manage, customers' emotional states (Shaw 2007). Some providers may view customer affect as "something to be dealt with" (Sparta 2008), without completely realizing the impact it may have on motivating or inhibiting customer participation.

Motivated by the broaden-and-build theory of positive emotions (Fredrickson 2001), this research considers whether customers who are able to muster and maintain a positive affective state—even in the face of an inherently uncertain circumstance—are better equipped and motivated to enact participatory behaviors that improve not only their outcomes but also their perceptions of the co-produced service experience. The broaden-and-build theory of positive emotions states that an individual's positive affective state has significant expanding effects on his or her behaviors; conversely, customers who succumb to a more negative affective state deem situations to be more difficult to navigate, which inhibits behaviors such as participation and information sharing (Fredrickson 2001; Fredrickson and Branigan 2005).[1]

Based on this premise, the purpose of this research is to investigate the underlying processes responsible for the effects of customer affect on outcomes during a customer's co-created service experience. We extend broaden-and-build theory by applying it to a relevant service context, health care, and by assessing positivity's effects not only on participatory behaviors but also on theoretically and managerially relevant service outcomes. We contribute to the development of theory on customer value co-creation by demonstrating that (1) customer positivity appears to "activate" participation behaviors in a health care services experience; (2) customer positivity and participation, in turn, drive the managerially important customer perceptions of quality and satisfaction; and (3) customer participation and service quality serve as mediators of the effects of positivity on customer satisfaction.

In the sections that follow, we explicate the central components of relevant theories on customer participation and positivity, and consider the implications for evaluating customer positivity and participation in a health care service experience. We then develop a conceptual model of the role of customer positivity and participation in customer perceptions of service outcomes and empirically test its hypotheses using a sample of 190 medical clinic patients. Finally, we report the results and discuss the implications for theory and practice.

Conceptual development

The notion of customers as active participants in the co-production of service as a means to co-create value is fundamental to a service logic (Grönroos 2006; Vargo and Lusch 2004). In fact, Vargo and Lusch (2004, p. 7) describe service as a process of "doing things in interaction with the customer." In this view, both service providers and customers apply resources, such as skills and knowledge, to a service interaction to acquire benefits. In this research, we assume a service-logic perspective and assimilate the broaden-and-build theory of positive emotions within an emerging customer participation paradigm. We specify a mediated model based on theory, which elaborates a causal sequence among positivity, behavior, and outcomes (Fredrickson 2001). In support of this conceptual structure is the knowledge that customer participation is linked to satisfaction through perceptions of value-creating activities (Chan et al. 2010), which we conceptualize as dimensions of service quality.

Affective state and positive emotions

In general, affective state is an important individual-level variable that can significantly shape one's cognition, intentions, and behavior. While positive affect allows individuals to access associated memories and frame their thoughts around related concepts, a negative affective state inhibits one's ability to process incoming information. In this way, positive affect enables individuals to consider enacting a large range of behaviors, while negative affect can lead individuals to "make mountains out of molehills" (Clore and Huntsinger 2007, p. 394).

[1] We use the term *affect* as a global construct for feeling that may contain various emotions that are situation-specific, often intense, and may be related to specific actions. For a more complete discussion, see Bagozzi et al. (1999).

The broaden-and-build theory of positive emotions contends that positivity, defined as a measure of relative situation-specific positive affect, leads to modes of behavior that prepare an individual for difficult situations (Fredrickson 2003). Conversely, under conditions of prevailing negative affect, individuals perceive that everything seems more difficult, which leads to the inhibition of purposeful behavior. The effects of positivity are expressed as flourishing, a human condition defined as "living within an optimal range of human functioning" (Fredrickson and Losada 2005, p. 678), and described as a "fundamental human strength" (Fredrickson 2001, p. 218). Although positive emotions indeed signal human flourishing, they also *produce* flourishing; negative emotions signal and produce languishing.

The dialectic seesaw between affect and action is ordered by broaden-and-build theory. The causal sequence between affective state and action results from positivity's effect on broadening "people's momentary thought-action repertoires, which in turn serves to build their enduring personal resources" (Fredrickson 2001, p. 218). The effects of these resources manifest in physical and psychological consequences, and also may have social and perceptual effects. Positivity is linked with increased functioning of bodily systems, improved health outcomes, brain and immune function (Davidson et al. 2003), and even longevity (Fredrickson and Losada 2005). More relevant to service co-production, positivity expands considered actions and activities, including creative problem-solving behaviors (Isen et al. 1987). Positivity thereby prompts individuals to "pursue novel, creative and often unscripted paths of thought and action" (Fredrickson 1998, p. 304). In this way, "experiences of positive affect, although fleeting, can spark dynamic processes with downstream repercussions for growth and resilience" (Fredrickson and Losada 2005, p. 679).

The broaden-and-build theory conceptualizes positivity as a situation-specific ratio of positive to negative affect (Losada and Heaphy 2004), which is predictive of specific thoughts, conditions, and actions. In fact, Fredrickson and Losada (2005) found that a specific critical positivity ratio threshold (2.9) distinguishes flourishing from languishing. Other research has tied positivity ratios to consequences as varied as marital outcome (Gottman 1994) and business team performance (Losada and Heaphy 2004). A relative measure of positivity is central to broaden-and-build theory because it represents the *extent* to which an individual is experiencing positive affect, reinforcing the robust finding by researchers that the valence of emotion (its positive/negative pole) is the best discriminator between emotional states (Losada and Heaphy 2004).

Overall, the broaden-and-build theory of positive emotions logically orders the sequence of positivity, action, and outcomes, suggesting that more active behaviors (customer participation) are an intervening mechanism for the effect of positivity on desired service outcomes. However, mechanisms by which positivity indirectly may affect consequences are under-identified (Fredrickson 2003) and have not been contextualized in a service setting. Although the role of affect is recognized as an important and emerging theme in medical research (e.g., Fallowfield and Jenkins 2004; Levinson et al. 2000), it has not been subjected to a test in a service context. Recognizing that health care service experiences are often deeply infused with emotion, we contend that customer affect will begin to develop prior to or immediately upon entering a service setting. Thus, affect may be positioned antecedent to behaviors that may occur during a "moment of truth" consultation with the service provider. Even as customer affect develops during customer participation, it theoretically is positioned as a motivator of behavior, because affective context provides an environment for participatory behaviors, consistent with broaden-and-build theory.

Customer resources and participation

Customer participation—defined as the extent to which customers share information, provide suggestions, and engage in shared decision making—reflects customer effort in co-producing a service (Chan et al. 2010). Customer participation has been shown to exert a significant impact on the design of organizations and the roles of employees and customers (Mills and Morris 1986; Skaggs and Huffman 2003). In health care services, for instance, patients are presented with the opportunity to co-create value *during* the service encounter by participating with health care providers through behaviors including (1) discussing their current condition and symptoms, (2) cooperating with diagnostic efforts, (3) sharing knowledge about potential treatment options, and (4) expressing their comfort level with, and desire to pursue, specific therapies and procedures.

However, contrary to expectations that sufficient incentives exist in the health care context to induce patients to contribute to the design of their care, participatory behaviors are found to have significant variance across patient populations (c.f., Cegala et al. 2007). This is due at least in part to the fact that health care services are characterized by provider-customer dual-sided knowledge and information asymmetry, as well as by high customer stress, involvement, and risk (Brown and Kirmani 1999)—conditions that test levels of customer resource generation and participation. Thus, improving patients' participatory behaviors remains an enormous challenge for health care practitioners (Roter 2000).

In health care, patient participation is most effective when it is focused on expressing opinions, stating preferences, and exploring options (Cegala et al. 2007). When

customer participation has been tested in marketing studies, it has been operationalized as a behavioral measure of the effort exerted during a service experience to facilitate a meaningful interaction through communication (e.g., Auh et al. 2007; Chan et al. 2010; Skaggs and Huffman 2003). We adopt the same conceptualization and operationalization for this study. Specifically, we investigate customer participation in the form of information sharing, discussion, and shared decision making; that is, activities such as volunteering information and discussing options that enable both provider and customer to learn more about the capabilities and needs of each other (Jaworski and Kohli 2006).

Service outcomes

Among the desired service outcomes of interest to theorists and practitioners are customers' perceptions of service quality and customer satisfaction. Including these outcomes in our model presents the opportunity to extend theory by assessing the effects of positivity and participatory behaviors on outcomes relevant to service management. Although broaden-and-build theory contends that positivity begets expanded behavior, it is not clear as to what the ramifications of positivity and resulting participatory behaviors are for perceptions of provider quality–and, ultimately, satisfaction with an experience.

Service quality perceptions are evaluations of the way the service is delivered by providers, and they are formed by customers during the service experience. Service quality has been shown to be an important intervening variable in service management research (Groth et al. 2009), and it is linked to a range of profitable customer behaviors, including loyalty and willingness to pay (Zeithaml et al. 1996).

Functional and technical dimensions of service quality are highly relevant to customer views of health care services (Dagger and Sweeney 2006; Taylor and Cronin 1994). *Technical quality* is the "what" component of a service interaction; that is, the evaluation of material content and provider expertise involved in the service experience. We define technical quality as the customer's perception of the expertise and skill of a primary service provider (e.g., a physician or tax attorney). *Functional quality* describes "how" the customer receives the service; it is the manner in which the service is provided (Grönroos 1983). We define functional service quality as a respectful, courteous, and friendly service interaction with a primary provider. The technical aspects of a service have been termed the "core element" of the service interaction, while functional quality represents a relational aspect that "can only be experienced in the presence of the service provider" (Doucet 2004, p.762).

A customer may be influenced by "the way in which the technical quality is transferred to him functionally" (Grönroos 1984, p. 39). Yet service quality and customer satisfaction are conceptually distinct constructs, and service quality has been modeled consistently as an antecedent to satisfaction (Cronin et al. 2000; Cronin and Taylor 1992a, b; Gotlieb et al. 1994; Gupta and Zeithaml 2006). Theoretical justification for this relationship is found in Bagozzi's (1992) appraisal→emotional response→coping framework. In this theory, appraisals of planned outcomes (for instance, of a planned health care service encounter) are linked to emotional reactions (affective response during a service encounter) that then lead to coping responses (participation behaviors).

Customer satisfaction is a state that results when an experience meets or exceeds the customer's needs or wants of a service (Oliver 1993). Customer satisfaction comprises both customer feelings and cognitive evaluations of a service experience (Cronin and Taylor 1992a, b; Dellande et al. 2004). Both negative and positive affective reactions also may influence satisfaction formation (Oliver 1993). Satisfied customers represent a significant asset for any organization (Gupta and Zeithaml 2006), influencing firm value (Anderson et al. 2004) and subsequent cash flows (Gruca and Rego 2005). Satisfaction remains an important source of feedback for managers, influencing strategic decision making.

We now turn our attention to the development of hypotheses. See Fig. 1 for our conceptual model.

Research model and hypotheses

In this section, we develop the relationships specified in our model, as motivated by the broaden-and-build theory of positive emotions. It is important to note that our conceptual model specifies the intervening effects of customer participation behaviors and perceptions of service quality, which serve to offer explanations for the role of positivity in a health care service encounter. In this way, our model builds theory on customer co-creation and expands broaden-and-build theory. Thus, we look more deeply, not more broadly, into the effects of positivity and participation.

Effects of customer positivity

By drawing on the broaden-and-build theory of positive emotions and being consistent with service logic foundations, we argue that when a customer experiences greater levels of positivity, he or she will be more likely to engage in customer participation behaviors. In turn, we propose that increased levels of these customer inputs will improve perceptions of quality. Specifically, we hypothesize that customer positivity will have indirect effects on customer perceptions of both the technical and functional aspects of service quality. We argue that this results from (1) positivity's direct effect on customer participation behaviors; (2)

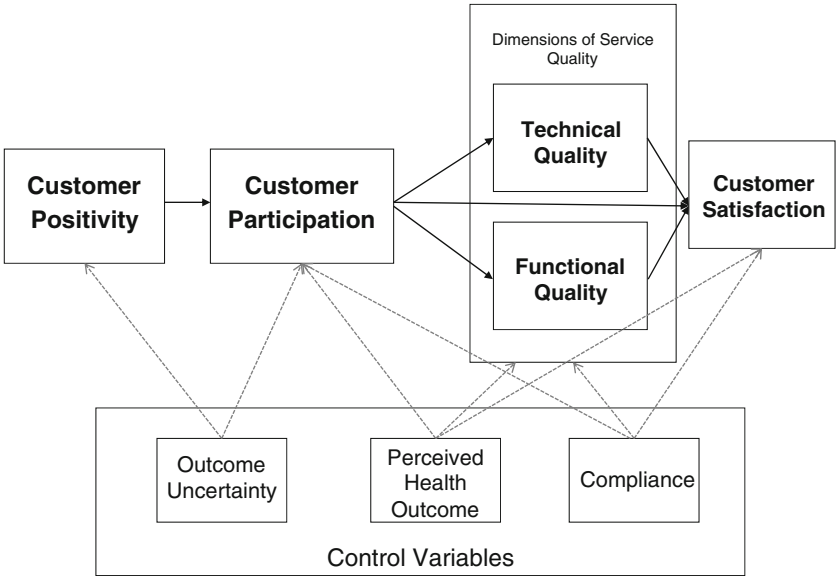

Fig. 1 Proposed conceptual framework of the effects of customer positivity and participation on service experience evaluations

customer participation's direct effects on co-producing service quality; and (3) positivity's effect on perceptions of service quality contingent upon behavioral contributions to co-create a service experience.

First, we theorize that personal pleasant affective conditions can lead to positive action (Fredrickson and Joiner 2002), prompting individuals to engage in often impulsive thoughts and actions. Positivity, by triggering approach and exploration, facilitates experiential learning opportunities and exploratory behavior (Fredrickson and Losada 2005), as well as effective problem solving (Fredrickson 2003). We test the robustness of the theorized effects of customer positivity by extending it to a health care services setting and posit that when a customer experiences positive affect in this context, he or she generates positive service-related actions.

Second, customer participation has been linked conceptually to perceived service quality (Dabholkar 1990; Kelley and Hoffman 1997) and value creation (Chan et al. 2010). This relationship also should hold for both technical and functional service quality, albeit for different reasons. It has been argued that customer participation contributes to improved technical quality through mechanisms of quality contributions and monitoring (Kellogg, Youngdahl, and Bowen 1997; Lengnick-Hall 1996). We suggest that customer participation contributes to functional quality through these mechanisms as well. In addition, it may be that participation prompts the service provider to respond positively to customer participation by increasing functional quality. In both cases, however, participation facilitates a higher order of communication that enables the customer to more clearly perceive the operant resources (knowledge, expertise) available to the provider. In this way, increased participation leads a customer to elevated judgments of dimensions of service quality by affording a less opaque, more informed view of what is being provided. In support of this reasoning, previous work has shown that as customers participate and learn, they are more capable of evaluating various attributes of service offerings (Auh et al. 2007).

Finally, we posit that customer participation will mediate the relationship between positivity and both dimensions of service quality, since affective state dimensions are related to perceptions of service quality (Oliver 1994), yet are activated by expanded behaviors. For instance, customers who are affectively positive must still communicate with their dentists about their conditions (pain location, previous history, pre-existing conditions) and preferences (for appearance, cost, and time) to co-produce quality experiences. Consistent with the broaden-and-build theory of positive emotions, positivity's power is in broadening behavioral objectives (customer participation), which leads to a better understanding and evaluation of how and what is co-produced.

H1: Customer positivity's effect on (a) technical service quality and (b) functional service quality will be mediated by customer participation.

Effects of customer participation

Differing levels of customer participation can produce varying perceptions of service quality, because service quality is perceived and determined by customers partly on the basis of their level of participation (Edvardsson 2005). This is consistent with the reasoning offered in support of H1 for the relationship between customer participation and service quality. Moreover, customer perceptions of satisfaction are generated from attributions of quality

(Vinagre and Neves 2008), and the two are inexorably related in a quality→satisfaction sequence (Cronin and Taylor 1992a, b; Dagger and Sweeney 2006). Customers perceive levels of technical quality as facilitators of satisfactory service outcomes, and functional quality captures process and social aspects of service interactions that affect client satisfaction (Sharma and Patterson 1999).

Thus, we posit that the relationship between customer participation and satisfaction will be mediated by the dimensions of service quality. Although previous work has shown that customer participation positively affects levels of customer satisfaction (Dellande et al. 2004) and is inherently satisfaction-seeking (Youngdahl et al. 2003), satisfaction with a service interaction also should rely on cognitive appraisals of the very nature of the experience (Homburg et al. 2006; Oliver 1994). Additionally, higher participation levels provide customers more opportunities to demonstrate their proficiency at engaging in technical discourse, thereby allowing them to gain insights into their providers' technical expertise (Bell et al. 2005).

In support of this argument, in health care services, mere customer presence versus more active customer participation may produce very different results of service interactions (Claycomb et al. 2001). Customers are encouraged in this context to provide information on preferences, capabilities, and sensitivities to risk. As a result, resource integration, when fully enacted, first leads to a quality interaction, then to satisfaction with the experience. This is supported by an argument for this temporal order in the customer participation→service quality→satisfaction chain (Kellogg et al. 1997). Thus, customer participation's effect on satisfaction should be mediated by quality perceptions.

H2: Customer participation's effect on satisfaction will be mediated by (a) technical service quality and (b) functional service quality.

Mediated relationships between positivity and satisfaction

Finally, we posit that positivity will be linked to satisfaction indirectly through customer participation and perceptions of service quality. We previously argued that positivity's relationships with dimensions of service quality are fully mediated by customer participation, and that dimensions of service quality fully mediate the relationship between customer participation and satisfaction. We acknowledge that a direct relationship between positivity and satisfaction may be conceptually developed, but in this context we believe this effect will be mediated by the intervening constructs.

First, positivity may be directly related to satisfaction, because both are affectively oriented and may be related through an individual's general tendency toward a positive outlook (Lyubomirsky et al. 2005). Additionally, research has found a direct relationship between positive affect and satisfaction with a product (Homburg et al. 2006), as well as a direct relationship between displayed customer emotion during a service encounter and evaluations of the encounter (Mattila and Enz 2002). Indeed, previous research finds that positive affect appears to be related to positive evaluation (Knowles et al. 1999).

However, we assert that the relationship between positivity and satisfaction requires intervening variables in the context of health care services because of a higher need for resource integration in co-production. That is, although positivity may have some effect on satisfaction, it will be insufficient alone to produce a satisfying experience in a potentially anxiety-provoking and customer resource–dependent context such as health care services. It has been found in service settings that a direct relationship between affect and satisfaction becomes nonsignificant in the presence of cognitively formed constructs such as quality and performance-based measures (Oliver 1994). Additionally, it has been found that service quality's influence on the evaluation of service outcomes is much stronger than positive mood (Knowles et al. 1999). Thus we hypothesize a mediated model with all predictors of satisfaction.

H3: Customer positivity's effect on satisfaction will be mediated by (a) customer participation, (b) functional service quality, and (c) technical service quality.

Research method and measurements

Research setting

Health care is an especially rich area in which to evaluate service marketing topics because of the depth and variance of service experiences. Health care organizations are exploring ways to integrate customer inputs more fully into their service processes. Health care providers have even called for patient participation in improving patient decision making and safety (Longtin et al. 2010). Indeed, in the provision of health care, organizations are increasingly finding that they have no option but to embrace customer participation and rethink ways in which to encourage and engage in participative interactions with patients. For example, Mayo Clinic's Center for Innovation helps physicians think more like designers in an effort to reconfigure factors that positively affect patient experience to result in improved patient attitude, involvement, and outcomes (Salter 2006). In health care, customers experience varying emotional levels and are

required to exert effort in service encounters; therefore, these factors may have significant effects on customer evaluations of the service.

Sample and procedure

The setting for this study is a large specialty medical clinic in the United States. The participating organization identified five departments (gastroenterology, hematology/oncology, transplant medicine, neurology, and cardiology) at one of its major sites as strategically important to its operations, and it provided access to patients from these departments. Selecting several departments within one specialty medical clinic affords variation in patient experience, positive and negative affect, dimensions of service experience, and perceived disease severity, while minimizing noise from multiple organizational contexts. Providers in this tertiary-care facility[2] treat patients who are dealing with situations that are becoming more familiar to them yet are nonetheless fraught with high levels of uncertainty and stress. These conditions provide a compelling context to examine the extent to which customers muster emotional resources and participate in their service experiences.

All patients between the ages of 21 and 75 who were referred to the five medical departments within a six-month time frame (October 2007 through March 2008) were eligible for inclusion in this study, resulting in a list of 735 eligible patients.

Surveys were developed to collect measures of all constructs. To bolster construct validity and reliability of the measures, a qualitative phase involving depth interviews with 21 patients, drawn from the same population as the main study, was used first to refine the survey. In this phase, respondents were asked about the general context of their experience, then were asked to consider and comment on each survey statement to assess respondents' thought processes as they formed answers to the survey items (Bolton 1993). Second, three health care providers and two administrators from the participating institution evaluated the instrument for problems with the content and wording of individual items. Finally, a preliminary version of the instrument was piloted with a separate sample of patients from the clinic, then shortened and refined based upon analyses of the resulting data (n=47). Minor changes to the instrument may be seen in the Appendix. There was no overlap between subjects in the pretests and the main study.

A desire to add measures to the survey needed to be balanced with a requirement to develop a parsimonious instrument. In addition to the research protocol, participating patients were scheduled to respond at a later date to an additional survey in order to comply with the organization's legal procedures and standards. Thus, because of the potential for overload, the instrument was developed to be sufficient but not lengthy.

The key informant for this study is the patient. The patient presents an ideal alignment with the phenomena under study, the measured constructs, and informant expertise. Unlike other studies that use service providers to report on customer perceptions (c.f., Skaggs and Huffman 2003), this study collected measures directly from the only individual involved in the service experience who possessed the ability to report on affect, behaviors, and perceptions. Moreover, to match the theoretical model and phenomena under study, our procedure directed the respondent to consider affect experienced *during* the service encounter, which differs from post-encounter affect measures directed toward a specific service provider (e.g., Jayanti 1996). Respondents were asked to consider a specific interaction with the same service provider (which occurred as a stage in the service delivery process) to assess customer participation and service quality perceptions. Thus, respondent evaluations of their levels of participation and of service quality were within the context of affect that occurred from the inception of the service encounter. Customer satisfaction measures captured a judgment of the entire service experience.

Customer data collection (both pilot and main study) was administered via telephone by a professional research firm. To improve response rate and reduce non-response bias, multiple attempts were made to contact each subject at varying times and days. Confidentiality was assured, and respondents were informed that results would be reported in aggregate form only. This resulted in 190 completed surveys, for an overall response rate of 28.5%. Response rates of this size are quite respectable and are comparable with previous survey research in health care (e.g., Brown and Kirmani 1999; Dellande et al. 2004), especially given that subjects are evaluating sensitive, health care–related experiences.

We checked the data for several differences among groups. First, to assess non-response bias, we analyzed differences between the response group (n=190) and the non-response group (n=477) for key descriptive variables. No significant differences were found between the two groups in terms of gender (p=.18), age (p=.12), state of residence (p=.18), or treating medical department (p=.51), indicating a lack of non-response bias in the data. Second, no significant differences existed based on whether or not the respondent self-identified as working in some area of health care (23.7% work in the health care industry). Third, responses did not vary across physicians (190 patients treated by 52 physicians, ICC for SAT=0.03, or only 3% of the variance in satisfaction was attributable to the effect of

[2] A tertiary-care facility refers to a major medical facility with subspecialties that provide a full complement of services that go beyond the capabilities of community-based specialists.

clustering by physician). Fourth, responses did not vary by level of education (46.3% have a college degree or higher), gender (56.3% female), or age (range of 24 to 75 years of age, mean of 56.3). Finally, satisfaction with the health care experience ($F(4,185)=2.6$, $p=0.04$) did vary by department treated (means across departments varied from 6.02 to 6.79, with a grand mean of 6.29). As a result of this difference, two analyses were conducted to assess the impact of the groups (patients within departments) in the data: (1) an intraclass correlation (ICC) was calculated and found to be low (only 4.1% of the variance in satisfaction was attributable to the effect of department); and (2) dummy codes for departments were created, and interactions between dummy variables and variables of interest demonstrated a lack of significance (positivity block R^2 change=0.005, $p=.64$, customer participation block R^2 change=0.018, $p=.06$, technical quality block R^2 change=015., $p=.06$, functional quality block R^2 change=0.002, $p=.89$) (Cohen et al. 2003). Taken together, these analyses indicate a lack of concern for inflated standard errors caused by clustering. Thus, we maintained disaggregated individual-level data.

Measures

The items used in this study can be found in the Appendix. Unless otherwise indicated, responses were obtained on a seven-point Likert scale ranging from "strongly disagree" (1) to "strongly agree" (7). Consistent with theory and conceptualizations of constructs, patients were instructed to respond to positive and negative affect items by referring to emotions *during their experience* at the clinic. For all other measures, respondents were instructed to recall their experience with a specific service provider.

Customer affect and positivity Affect scores were measured using the brief Positive and Negative Affect Schedule (PANAS) (Watson et al. 1988), which has been demonstrated to be a reliable and valid measure, and which has been widely used in management literature (i.e., Groth et al. 2009). This scale has been shown to be robust to varying time frames (Ilies et al. 2006) and has shown good convergent validities with related scales (Watson et al. 1988). It has been used to assess affect during various time periods, from the present moment to the past year. Using a seven-point scale to be consistent with other measures in this study, we asked subjects to indicate the extent to which they experienced the items in PANAS *during their service experience* at the clinic. Both positive affect ($\alpha=0.82$) and negative affect ($\alpha=0.88$) scales contain ten emotions.

Positivity was calculated in a manner consistent with the conceptualization of positivity in the broaden-and-build theory: "The affective texture of a person's life … can be represented by its *positivity ratio*, the ratio of pleasant feelings and sentiments to unpleasant ones" (Fredrickson and Losada 2005, p. 678, italics in original). Moreover, our operationalization is consistent with the one used by Fredrickson and Losada (2005), which incorporates different cutoffs for different valences to account for known asymmetries between positive and negative affect. Specifically, negativity bias asserts that bad events have greater weight than good ones (Baumeister et al. 2001). A positivity offset accounts for the understanding that most people feel mild positive affect overall (Fredrickson and Losada 2005), reflected in a positive level of subjective well-being, even among disadvantaged and health-compromised subjects (Diener and Diener 1996). Thus, in constructing the positivity ratio, positive affect items were converted to one if they equaled or exceeded four (otherwise coded zero), and negative affect items were converted to one if they were equal to or greater than two (otherwise coded zero). These thresholds are consistent with the cutoffs for moderately experienced positive emotions and with "negative emotions experienced at least *a little bit*" (Fredrickson and Losada 2005, p. 683, italics in original). Thus, a positivity ratio was computed for each subject by dividing the number of positive affect items meeting the threshold by the number of negative affect items meeting the threshold.

Customer participation In this study, customer participation is defined as the extent to which customers provide/share information, make suggestions, and become involved in decision making, consistent with extant work (Chan et al. 2010). Our four-item scale for customer participation ($\alpha=0.820$) was developed for this study through (1) examination of theoretical and conceptual definitions of the construct (i.e., Bitner et al. 1997), (2) exploration through qualitative work, and (3) refinement in the quantitative pilot phase. We were careful to examine customer participation as it related to the patient experience while interacting with a primary provider, instructing the respondent to think specifically about a particular experience while at the clinic. Additionally, individual items included reference to this specific experience at this clinic, i.e., "While I was at [organization X], I told my doctor what I knew about my condition." The resulting scale is highly consistent with extant empirical work on customer participation (c.f., Chan et al. 2010).

Dependent variables Measures of technical service quality ($\alpha=0.89$) and functional service quality ($\alpha=0.86$) were inspired by the conceptual definitions of technical and functional quality proposed by Grönroos (1984) and developed from the work of Brown and Swartz (1989), Swartz and Brown (1989), and Dagger and Sweeney (2006). The meaning of the constructs and potential representative statements also were explored during the qualitative phase and refined in the pilot phase. The two dimensions of service quality—

technical and functional quality—measured with two-item scales are highly correlated but achieve discriminant validity because they represent related, yet distinct, customer perceptions of a particular service experience. The use of two scale items per dimension for service quality is consistent with recent work (Groth et al. 2009). The measures of the two dimensions of service quality are brief because of the need to restrain the length of the survey instrument for respondents, a key concern for reliability and response rates. Technical quality specifically measured patient perceptions of the demonstrated expertise and medical skill provided by the primary service provider (i.e., "My doctor at [organization X] is very capable of doing his/her job"). Functional quality, or how the service was provided, measured the perceived quality of the interaction with the primary service provider (i.e., "My doctor at [organization X] treated me with respect").

The three-item customer satisfaction scale (α=0.90) was developed similarly. The work by Oliver (1993) was considered when developing the conceptual definition and operationalization for the satisfaction construct. An item example is, "I am pleased with the way I was treated at [organization X]."

Control variables We control for several important covariates. Measures of these factors are shown in the Appendix. All control variables were collected using single-item measures, shown to be reasonable when the items are positively worded and contain a fairly high level of intensity (Alexandrov 2010), both conditions that are met in this study. Overall, single-item measures of control variables were required because of the need to maintain parsimony in the instrument and a preference for multiple-item scales for variables of interest.

First, a patient's level of compliance was included as a control variable, because it can lead to satisfaction (Dellande et al. 2004) and also may affect perceptions of the quality of the service delivered. Because our measure of compliance captures behavior subsequent to the service experience under study here, it may affect perceptions of the service experience. The measure of patient compliance was motivated conceptually from previous work (Dellande et al. 2004) and was: "Since my visit to [organization X], I have followed my doctor's instructions."

Second, the patient's perceived health outcome can influence perceptions of the service experience. It has been shown that goal attainment (a measure of outcome) leads to satisfaction with both the service and the provider (Dellande et al. 2004) and that health outcome may also influence perceptions of quality and satisfaction (Amyx and Bristow 2001). Specifically, process variables in health care have less effect on patients' evaluations of health care quality when the health outcome is successful (Lytle and Mokwa 1992). The patient's perceived health outcome was measured with the statement "Overall, I rate the end result of my care as… " with a five-point scale anchored by "much worse than expected" and "much better than expected."

Finally, perceived disease severity also was included as a control variable to provide the most complete assessment of the direct effects of the variables of interest. Perceived disease severity, or the risk inherent in a particular health care service (in this context, a measure of the uncertainty of a favorable health outcome), can be an important characteristic in the assessment of customer perceptions and behaviors (Dubé et al. 1996). This uncertainty in outcome may affect the level of a customer's participation in their service experience, as well as their emotional response during an experience (Bagozzi et al. 1999). Perceived disease severity was measured via patient perception, where patients indicated their response to "The condition I was treated for at [organization X] was…" on a seven-point scale, anchored by "not at all serious" and "extremely serious."

Measure validation

All measures were subjected to confirmatory factor analysis using AMOS 17.0 to assess discriminant validity, reliability, and unidimensionality. In general, construct measures showed very good psychometric properties. All scales showed high reliabilities, with Cronbach's alphas well in excess of the recommended cutoff value of 0.70 (Nunnally and Bernstein 1994) and high composite reliabilities. Table 1 shows the construct correlations and descriptive statistics.

First, a CFA model was estimated that included customer participation, functional service quality, technical service quality, and satisfaction. Model fit statistics were acceptable with the exception of RMSEA, which was not at the recommended cutoff ($X^2_{38} = 171.7$, p=.000, CFI=0.908, RMSEA=0.136). Functional quality and technical quality were highly correlated (r=.68), in line with expectations, as dimensions of service quality are conceptually related yet were demonstrated to be statistically distinct. We confirmed discriminant validity among all constructs, as the average variance extracted exceeded the square of correlations between constructs (Fornell and Larcker 1981). Collinearity was not an issue in hypothesis testing, as all variance inflation factor (VIF) values were less than two (Nunnally and Bernstein 1994). Because of the ratio nature of the positivity measure, it was not appropriate to include it in the CFA as a multiple-item scale. Instead, we evaluated the discriminant validity of the positive and negative affect items separately, using a CFA (Promax with Kaiser Normalization). This analysis demonstrated that items loaded correctly on two components, interpreted as positive and negative affect.

Table 1 Descriptive statistics and correlations of study variables

Variable	Mean	s.d.	AVE/CR[a]	1.[b]	2.	3.	4.	5.	6.	7.
1. Technical Quality	6.59	0.89	0.800/0.979	0.887						
2. Functional Quality	6.68	0.82	0.781/0.978	0.683**	0.861					
3. Satisfaction	6.29	1.30	0.755/0.969	0.634**	0.705**	0.903				
4. Customer Participation	6.63	0.75	0.546/0.974	0.275**	0.356**	0.364**	0.82			
5. Positivity	1.16	0.30	N/A[c]	0.209**	0.154*	0.179*	0.176*	N/A[§]		
6. Compliance	6.42	1.32	N/A[d]	0.317**	0.320**	0.488**	0.214**	0.127	N/A[d]	
7. Perceived Outcome	3.92	1.29	N/A[d]	0.211**	0.318**	0.398**	0.161*	0.208**	0.215**	N/A[d]

n=190

[a] Fornell and Larcker's average variance extracted (ρvc) and composite reliability; AVE values for PA=0.925 and NA=0.943

[b] *Diagonal* Cronbach's alpha; *subdiagonal* inter-construct correlations

[c] Positivity is an index created from Positive Affect (PA) and Negative Affect (NA) values; Cronbach's α values are as follows: PA=0.818, NA=0.878

[d] Single item measure

*p<0.05, **p<.01 (2-tailed)

Discriminant validity was achieved between positive and negative affect, and reliabilities are quite acceptable (NA α=0.88, PA α=0.82). Thus, we conclude that the psychometric properties of all constructs are acceptable for hypothesis testing, which is particularly important for tests of intervening effects (Mathieu and Taylor 2006).

Common method bias To address the possibility of common method bias, the following precautions were used, as recommended by Podsakoff et al. (2003). First, predictor and criterion variables were distanced as much as possible in the survey instrument by other instrument items not included in this study. Second, protection of respondent anonymity was asserted, as was the fact that there was no right or wrong answer. Third, scale items were constructed by carefully adapting, where possible, extant items from sources that have established reliability and validity. Additionally, items were refined through information obtained from subject interviews and through pilot testing, as discussed previously.

Post-hoc assessment of potential method bias was performed by employing the marker-variable approach (Lindell and Whitney 2001). The use of the marker variable followed the recommendations of Lindell and Brandt (2000), where the smallest positive value within the correlation matrix is a conservative estimate of bias. A variable that satisfied the preceding criteria in our study is perceived disease severity, a measure of the risk inherent in the patient's health condition, which does not tap into behavioral or affective dimensions specific to the patient but rather refers to the perceived severity of the health condition that precipitated a patient referral to this clinic. The pattern, magnitude, and statistical significance of the correlations among the predictor variables, three criterion variables, and control variables after partialling out the marker variable were nearly identical to those of the unadjusted correlations, with the smallest positive value in the correlation matrix of 0.005 (perceived disease severity with positivity). This test provides evidence that common method bias is not an issue in our dataset.

Analysis and results

Based on our theoretical development and consistent with previous research (Chan et al. 2010; Meuter et al. 2005), ordinary least squares (OLS) regression analysis and bootstrapped mediation tests (Preacher and Hayes 2008) were used to test all hypotheses. We assessed the mediating roles of customer participation and dimensions of service quality using procedures for testing mediation outlined by Mathieu and colleagues (Mathieu et al. 2008; Mathieu and Taylor 2006). This method is similar to Baron and Kenny's (1986) suggested approach, yet it differs in two important ways. First, mediation types may differ from Baron and Kenny's model, and thus they need to be assessed appropriately (Zhao et al. 2010). In line with this argument, "there should be only one requirement to establish mediation, that the indirect effect a x b be significant" (Zhao et al. 2010, p. 198), instead of exclusively testing for a direct effect first. However, Baron and Kenny tests may subsequently provide utility in classifying the type of mediation (Zhao et al. 2010). We take this two-step approach for hypothesis testing.

Second, Zhao et al. (2010) argue that testing the significance of the indirect path of mediation by the Sobel z-test is

insufficient because of a non-normal sampling distribution of products and the test statistic. Instead, they suggest that Preacher and Hayes' (2008) "bootstrap" test of indirect effects serve as a stringent test of mediation. This test generates an empirical sampling distribution of the mediated effect, thereafter estimating parameters and generating a 95% confidence interval (α=0.05) from the bootstrap samples. Models are deemed to be significant if the confidence interval does not contain zero. This method also allows for covariates (appropriately included in all models) and multiple mediators.

Finally, when testing multiple mediators, there is an advantage of testing the total intervening effect of the independent variable X on the dependent variable Y, which is equivalent to regression analyses with several predictors (Preacher and Hayes 2008). The multiple-mediation model also reduces the likelihood of parameter bias because of omitted variables. The results of the hypothesis tests are shown in Table 2.

Our first hypothesis posits customer participation as a mediator of the relationship between positivity and dimensions of service quality. The results in section C of Table 2 indicate that customer participation significantly mediates the relationships between positivity and both functional service quality (bootstrap test of indirect effect 95% confidence interval limits of 0.04 and 0.56) and technical service quality (95% CI of 0.03 and 0.51). The results presented in section A of Table 2 (Models 1a and 1b) also demonstrate that positivity is significantly and positively related to participation (β=0.18, p<.05). Models 2 and 4 also show that participation has a significant, positive relationship with both technical service quality (β=0.19, p<.05) and functional service quality (β=0.15, p<.05), thus providing support for the main effects of customer participation on dimensions of service quality. Finally, as shown in Model 3, the relationship between positivity and technical quality remains significant (β=0.15, p<.05) with the inclusion of participation (β=0.26, p<.05), a partial mediation (R^2 change<0.05). However, the relationship between positivity and functional quality (Model 5) becomes nonsignificant (β=0.09, p=.18) when the significant effect of participation is included (β=0.35, p<.05), indicating indirect-only (full) mediation. This stringent test of the intervening effects confirms the significant complementary mediating effect of customer participation on the relationship between positivity and technical service quality (R^2=0.13), and the significant indirect-only mediating effect of customer participation on the relationship between positivity and functional service quality (R^2=0.14), thus supporting H1a and H1b. Taken together and consistent with broaden-and-build theory, these analyses confirm that customer participation partially mediates the relationship between positivity and technical service quality, and fully mediates the relationship between positivity and functional service quality.

Next, the hypothesized mediating effects of dimensions of service quality on the relationship between customer participation and satisfaction were assessed. The results in section C of Table 2 provide general support for mediation in this model (bootstrap test of indirect effect 95% confidence interval limits of 0.10 and 0.66), due to the significant mediating role of functional quality (95% CI of 0.08 and 0.46) only. However, it is important to assess the impact of both dimensions of service quality individually to determine the nature of this mediation. The mediating effect of technical quality is not significant (95% CI of -0.01 and 0.29), thus not supporting H2a. As shown in section B, Model 6, participation is positively directly related to functional quality (β=0.28, p<.05). Although the direct effect of participation on satisfaction (Model 8) is positive and significant (β= 0.24, p<.05), Model 9 shows the relationship becomes nonsignificant (β=0.08, p=.11) with the addition of functional quality (β=0.38, p<.05) and technical quality (β= 0.25, p<.05), supporting an indirect-only (fully) mediated model (R^2 change=0.25, p<.05). Thus, consistent with previous work showing a mediated relationship between customer participation and satisfaction (Chan et al. 2010), we find that the relationship between customer participation and satisfaction is only indirectly (fully) mediated by functional quality (R^2=0.64), providing support for H2b.

Finally, the hypothesized mediated model leading from positivity to satisfaction was assessed consistent with Taylor et al. (2008) recommendations for testing three-path mediation to include the percentile bootstrap resampling technique (as employed thus far in this paper), which has been demonstrated to perform well and to be more conservative in testing mediation chains. This procedure involves estimating models of (1) the direct effects of positivity on participation (already shown to be significant and positive in Model 1b); (2) the effects of positivity and participation on both technical quality (Model 3, both are significant and positive) and functional quality (Model 5, only customer participation is significant); and (3) the effects of positivity, participation, technical quality, and functional quality on customer satisfaction (Model 9, only functional quality and technical quality are significant).

The results of the bootstrapped intervening model in section C of Table 2 show a nonsignificant total effect (bootstrap test of indirect effect 95% confidence interval limits of -0.07 and 0.76) between positivity and satisfaction. However, there is a significant mediating effect of technical quality (95% CI of 0.01 and 0.48), but not functional quality (95% CI of −0.13 and 0.33) or participation (95% CI of −0.03 and 0.25), therefore rejecting H3a and H3b. Because investigation of specific mediators within a nonsignificant

Table 2 Results of hypothesis tests

A: The Effects of Positivity and Participation on Technical Service Quality and Functional Service Quality (H1)[a]

Variables	Model 1a: Customer participation	Model 1b: Customer participation	Model 2: Technical service quality	Model 3: Technical service quality	Model 4: Functional service quality	Model 5: Functional service quality
Step 1: Control Variables						
Perceived Disease Severity	−0.047 (0.038)	−0.065 (0.038)	0.155† (0.044)	0.172** (0.042)	0.060 (0.041)	0.082 (0.039)
Step 2: Independent Variables						
Positivity		0.183** (0.182)	0.194** (0.212)	0.147** (0.208)	0.148** (0.200)	0.085 (0.192)
Customer Participation				0.257** (0.082)		0.345** (0.076)
Total R^2	0.002	0.035	0.068	0.131	0.027	0.142
Change in R^2		0.033**		0.064**		0.115**

B: The Effects of Positivity, Participation, and Dimensions of Service Quality on Customer Satisfaction (H2 & H3)[a]

Variables	Model 6: Functional Service Quality	Model 7: Technical Service Quality	Model 8: Customer Satisfaction	Model 9: Customer Satisfaction	Model 10: Customer Satisfaction	Model 11: Customer Satisfaction
Step 1: Control Variables						
Perceived Disease Severity	0.057 (0.037)	0.154** (0.041)	0.004 (0.053)	−0.057 (0.041)	−0.020 (0.055)	−0.084† (0.045)
Perceived Health Outcome	0.228** (0.042)	0.125† (0.047)	0.279** (0.060)	0.161** (0.048)	0.295** (0.063)	0.231** (0.051)
Compliance	0.204** (0.042)	0.225** (0.047)	0.377** (0.060)	0.243** (0.048)	0.419** (0.061)	0.288** (0.052)
Step 2: Independent Variables						
Customer Participation	0.279** (0.073)	0.214** (0.081)	0.238** (0.104)	0.078 (0.084)		
Technical Service Quality				0.252** (0.092)		0.508** (0.078)
Functional Service Quality				0.380** (0.103)		
Positivity				[−0.006 (0.205)][c]	0.066 (0.271)	
Total R^2	0.241	0.183	0.382	0.636	0.333	0.551
Change in R^2				0.254**		

C: Bootstrapped Mediation Tests (H1, H2, and H3)[b]

Mediator(s) →	Customer Participation		Technical Quality	Functional Quality	Customer Participation	Total Effect
Dependent Variable →	Technical Quality	Functional Quality			Satisfaction	
Variables						
Positivity	0.0361 to 0.5591**	0.0334 to 0.5128**	0.0133 to 0.4771**	−0.1327 to 0.3327	−0.0256 to 0.2463	−0.0693 to 0.7624
Adjusted R^2	0.169	0.128				0.622
Customer Participation			−0.0098 to 0.2908	0.0759 to 0.4608**		0.1043 to 0.6590**
Adjusted R^2						0.624

† $p<.10$

** $p<.05$

[a] Standardized regression coefficients (standard errors) for each variable and R^2 for each model

[b] Statistics are lower and upper limits of bias corrected and accelerated 95% confidence intervals after 1000 iterations. Appropriate covariates are included in each model. In the SAT models, all mediators are modeled simultaneously; CIs are then reported individually and for the total effect

[c] Adding positivity to this model does not change the values of the other variables

multiple-mediation model is recommended (Preacher and Hayes 2008), we further explored the relationship involving technical service quality.

Although there is a significant indirect-only mediating role of participation alone on the relationship between positivity and satisfaction (95% CI of 0.03 to 0.41, model not shown), this effect is reduced to nonsignificance when technical quality and functional quality are added as additional mediators. As confirmed in Model 10, positivity is not significantly directly related to satisfaction (β=0.07, p=.26); however, also shown earlier, positivity is significantly and positively directly related to technical quality (β=0.19, p<.05, Model 2), and technical quality is significantly and positively directly related to satisfaction (β=0.51, p<.05, R^2=0.55, Model 11). Taken together, these results suggest that positivity and satisfaction are indirectly related through a significant relationship with technical quality (total mediated effect=0.194), an indirect effects model, in support of H3c. This finding provides a novel view of the role that perceived technical quality plays in linking customer-specific states and behaviors to satisfaction, extending previous work (Bell et al. 2005; Sharma and Patterson 1999).

Discussion

In this research, we contribute to emerging theory on value co-creation by introducing and empirically validating customer positivity as an antecedent to customer participation. This is the first study we are aware of that provides empirical evidence of customer affective state as a significant antecedent to customer participation. Overall, we show that (1) customer positivity is associated with higher levels of customer participation; (2) customer participation partially mediates the relationship between positivity and technical quality, and it fully mediates the relationship between positivity and functional quality; (3) customer participation is linked positively to satisfaction through functional service quality; and (4) positivity is related to satisfaction through technical service quality. Taken together, the customer resources of positivity and participation have important effects on managerially relevant and actionable service outcome measures.

We extend the broaden-and-build theory of positive emotions to a new context, thereby exposing it to a new behavioral variable (customer participation in a health care service) as well as to new perceptual outcomes (service quality and satisfaction). Our results expand upon emerging theory of customer value co-creation by showing that customers in highly uncertain circumstances who are able to muster the necessary emotional resources generate increased levels of participatory behaviors. Moreover, positivity and participation predict higher levels of perceived service quality in addition to satisfaction. We theorize that customer participation's effect on satisfaction, mediated by functional service quality, is a result of enhanced resource integration through listening and knowledge assimilation (Gaur et al. 2011). That is, in health care services, a patient is able to co-create a satisfying experience by enhancing and managing service quality. Co-production of a satisfying service encounter requires resource integration, which occurs through a foundation of respect and courteous interaction (functional quality)—a finding that is consistent with previous work (Auh et al. 2007).

It is interesting to note the important role of customer perceptions of technical service quality, which is predicted by levels of customer participation and mediates the relationship between positivity and satisfaction. It consistently has been stated that technical quality is very difficult for customers to assess, even after a service encounter (Berry and Bendapudi 2007). Although this may be true in most circumstances, we find that in this context of patients visiting a tertiary-care medical facility, customers are capable of distinguishing and assessing technical quality. That is, patients with conditions previously considered difficult to treat by community-based providers appeared capable of assessing their physician's technical expertise, which perhaps was made possible by their enhanced knowledge resources or client expertise (Auh et al. 2007).

The nature of positivity in these data also is interesting and informative to theory. Why is positivity for customers in this study so high (index mean of 1.16, 122 out of 190 [64%] respondents exceeded an index of 1.0; PA mean=5.01, NA mean=2.98), in light of the fact that respondents were cared for at a tertiary-care clinic for a medically serious and previously untreatable condition? These results were found in a health care services context where perceived disease severity (risk) also was quite high (mean of 5.87/7). It would be prudent to assume that most customers in this situation would experience negative emotions (including nervousness and fear) to a greater extent than positive emotions (including enthusiasm and inspiration). The broaden-and-build theory of positive emotions is quite informative in this case: individuals attempt to improve their psychological well-being—and thereby their physical health—by evoking positive emotions leading up to "moments of truth" to cope with negative situations (Fredrickson 2001). In effect, the uncertain and challenging context into which the patients enter is the very trigger for them to activate positive emotions in a natural response intended to maximize their probability of a successful outcome. Fredrickson (1998, p. 313, italics in original) supports this reasoning: "Positive emotions ought to function as efficient *antidotes* for the lingering effects of negative emotions." Thus, it appears that customers activate positive affect, broadening their

thought-actions and subsequent participative actions, in an effort to develop effective coping behaviors, as documented in clinical health care (Chen 2011). This is a profound insight in that it has implications for health care services practice and for extension of theory on customer participation. We assert that customer affect before and during a service encounter must be incorporated into emerging theory on value co-creation by considering both its direct effects on customer participation and its downstream effects on customer evaluations of a service encounter.

Finally, it should be noted that our model explains a large percentage of the variance in customer satisfaction (R^2= 0.636, $R^2_{adj} = 0.622$). This provides support for the notion that (1) accounting for customer affective states and customer participation in health care services is warranted; (2) technical and functional dimensions of service quality are important intermediate measures of a service experience; and (3) integrating customer resources (positivity and participation) into a health care service encounter enhances our understanding of customer satisfaction in these complex situations. We argue that these findings, based on the broaden-and-build theory of positive emotions, extend the theory of positivity into a service context through a relevant behavioral construct (customer participation) to previously unexplored perceptual outcomes (service quality and satisfaction).

Managerial implications

The results of this research provide several specific implications for health care service managers and providers. First, this research identifies customer positivity as a managerially meaningful antecedent to customer participation and perceptions of service quality. Our research demonstrates that patients are able to differentiate between technical (clinical) quality and functional (service) quality. This is no small matter to the health care community, as its members often have struggled to properly represent and help patients recognize technical quality. Emerging discussions regarding the changing roles of patients and health care providers suggests that the "demystification" of medical and technical knowledge has presented challenges to, and opportunities for, doctor–patient interactions to be more inclusive and egalitarian (Parker-Pope 2008). As patients are being encouraged to more actively participate in their health care, it will become increasingly essential for providers to understand and manage patient affect. By helping patients optimize their affective states, health care providers can increase patient assessment of their expertise in addition to patient satisfaction.

Based on these results, service managers may choose to influence customer affect by designing service interactions that enhance customer participation and satisfaction. Identifying customers' affective states before and during a service interaction could provide health care service providers with "helpful cues as to how to customize the service delivery" (Mattila and Enz 2002, p. 274). For instance, Mayo Clinic collects information from patients upon entering the facility regarding their disposition, emotional state, any information the patient may have collected, and questions the patient would like to have answered. This pre-encounter process provides front-line employees with important information that may be used to highlight and reinforce reasons for patients to remain positive about their situations. It also may prompt patients to be prepared to actively engage in their diagnosis, procedures, and treatment. To be most effective, it is imperative to have health educators consult with patients *prior* to physician consultation, to assist patients in addressing emotional issues in addition to identifying questions and concerns that then lead to increased participation levels (Roter 1984).

Using service blueprinting, a technique for designing customer experiences that integrates customer actions, employee actions, support processes, and physical evidence to improve a service process (Bitner et al. 2008), service designers and providers can identify opportunities to enhance or reinforce positivity. This, in turn, improves managers' and providers' abilities to properly design physical spaces in an effort to align service design and delivery capabilities with customer resources and preferences (Salter 2006). As an example, the health services innovation class at Parsons the New School for Design created new environments for patients at Memorial Sloan-Kettering Cancer Center in New York that accounted for patients' and families' emotional states and thereby facilitated more productive interactions and behaviors (Howard 2010). Health care providers can draw from the combination of factors that provide hope and foster a positive outlook in an effort to positively influence participation behaviors. The result of these processes, when performed properly, may be to activate positivity in such a way that it effects changes on participation behaviors, and on perceptions of service quality and satisfaction.

Providing customers with options for a specific plan of action is an effective method to enable patients to transform uncertainty–and even fear–into favorable attitudes and expanded behaviors (Leventhal et al. 1965). That is, in the context of patient–provider communication, anxiety-producing discussions can lead to positive behavioral change when details of patient actions are provided, and when barriers to action are lowered or even eliminated. Moreover, participation is enhanced when information is accompanied by explanation customized to the specific client, and when customer knowledge is recognized and rewarded (Eldh et al. 2006). Therefore, a specific recommendation emanating from this research is for health care providers to listen to and

translate customer preferences and anxieties into options for specific follow-up behaviors (Hibbard 2009), with at least one of the options available to the patient without unnecessary delay.

Additionally, health care providers should not overlook the importance of the effects of customer positivity and participation on customer perceptions of providers' technical (medical) expertise. Because of their advanced education and training, many service providers are insensitive or reluctant to recognize customers' emotional states (Odhuba 2010) or encourage customer participation, with the view that customers may interfere with service production and efficiency because of biased emotional conditions or inadequate knowledge. Our research is a potent reminder to health care professionals to open their practices to help patients recognize and manage their emotions to facilitate positivity (Sparta 2008) and encourage them to participate, all with a recognition that such actions will enhance the provider's reputation for expertise and patient sensitivity. Even small efforts from patients to communicate with a physician should be rewarded, with the recognition that escalation in information exchange may occur (Cegala et al. 2007). We thus urge health care providers and managers to incorporate affect contributors in their design of servicescapes (e.g., live music performances, art galleries, and walking gardens) and in dialogues with patients to provide cues for optimism and invoke a more positive construal of the interaction (Locke 1996).

Limitations and directions for further research

We believe our findings provide robust support for our theoretical model and predicted relationships. However, like any research, ours has limitations. First, findings may be limited by the conclusions drawn from a single study site—especially one where overall satisfaction levels are high. Still, the involvement of five distinct medical departments provides at least a limited basis for generalizability, since overall satisfaction varies across departments. Nonetheless, further research is needed to confirm and expand the results discussed here.

Moreover, the fact that our study is conducted in a single professional service context—health care—also may limit generalizability. Since similar service contexts exist across professional services, we argue that our results are applicable to comparable settings, especially those in a similar position on a professional services continuum (von Nordenflycht 2010). For instance, a situation involving an interaction with a tax attorney or business consultant often also involves uncertainty and strong (perhaps competing) emotions, and it also requires customer participation for the service interaction to function properly. However, extending the findings from this study to other service contexts might show changes in the relationships among variables. Therefore, additional research should evaluate the impact of positivity and participation in a variety of service contexts.

Additionally, there may be multiple factors that influence an individual's affective state at any given time. We did not attempt to capture antecedents to affect, as it was outside the scope of our study. However, future research should consider how factors such as enduring personality traits (including agreeableness, extraversion, and locus of control) might influence an individual's positivity.

Finally, nonexperimental research designs naturally pose limitations with regard to claims of causality. It is well-recognized that correlational research designs can't confirm causal sequence (Mathieu and Taylor 2006), and inferences therefore need to be tempered with caution (Stone-Romero and Rosopa 2008). In cases where alternative models are considered, theory must be "the driving force behind the specification of the analytic model" (Mathieu et al. 2008, p. 212). We acknowledge that our investigation is motivated by a particular theoretical lens and that other causal sequences may exist. In this research, the broaden-and-build theory of positive emotions clearly articulates the specific causal sequence of positive emotion→behavior→perception evaluated in this research. Nonetheless, there exists an opportunity to reconfirm results shown here, and to further explore these relationships through alternative research designs–including experiments and longitudinal models.

Conclusion

Our study is the first to specifically explore the role of customer affective state and participation during a health care service encounter. We find evidence that customer positivity predicts participation behaviors, which lead to increased perceptions of service quality and satisfaction. For marketing scholars, our work suggests that the emerging theory of customer value co-creation should explicitly include affective dimensions and antecedents. For practitioners, our work indicates that careful customer management, especially surrounding emotional states, may have implications for customer participation and subsequent critical customer assessments of the service provider and experience.

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Appendix

Table 3 Measurement scales

Construct	Label	Item
Technical	TQ1	My doctor at Organization X is very capable of doing his/her job.
Service	TQ2	My doctor at Organization X is highly trained in his or her specialty.*
Quality	TQ3	My Organization X doctor is quite skilled in his/her job.
Functional	FQ1	My doctor at Organization X treated me with respect.
Service	FQ2	My doctor at Organization X provided courteous and friendly service to me.
Quality	FQ3	My Organization X doctor was considerate of my needs.*
Customer	SAT1	Overall, my doctor at Organization X has been very helpful to me.
Satisfaction	SAT2	I am pleased with the way I was treated at Organization X.
	SAT3	I am very satisfied with the attention given to what I had to say by my doctor at Organization X.*
	SAT4	I am very satisfied with my experience at Organization X.
Customer Participation	CP1	During my visit to Organization X, I actively shared information I had with my Participation doctor.
	CP2	I participated in a discussion about my condition with my doctor at the Organization X.
	CP3	While I was at the Organization X, I told my doctor what I knew about my condition.
	CP4	I made considerable effort to discuss my condition with my doctor at Organization X.
	CP5	I worked hard to participate in my care at Organization X.*
	CP6	I put a lot of effort into being a good patient at Organization X.*
Affect	PA	Interested, Excited, Strong, Enthusiastic, Proud, Alert, Inspired, Determined, Attentive, Active
	NA	Distressed, Upset, Guilty, Scared, Hostile, Irritable, Ashamed, Nervous, Jittery, Afraid
Perceived	OU	The condition I was treated for at Organization X was:
Disease	Anchors: 1=Not at all serious and 7=Extremely Serious	
Severity		
Perceived	OUTC	Overall, I rate the end result of my care has been:
Health	1 – Much worse than I expected	
Outcome	2 – Somewhat worse than I expected	
	3 – About what I expected	
	4 – Somewhat better than I expected	
	5 – Much better than I expected	
Compliance	COMP	Since my visit to Organization X, I have followed my doctor's instructions.

*Item dropped after pilot phase

Scale sources: TQ and FQ – motivated by Grönroos (1984); SAT – motivated by Oliver (1993); CP – consistent with Chan et al. (2010); Affect – Watson, Clark & Tellegen (1988); OU and OUTC – developed for this study; COMP – motivated by Dellande et al. (2004)

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