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Uncertainty Avoidance as a Moderator of the Relationship between Perceived Service Quality and Customer Satisfaction

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The extent to which members of different cultures vary in their reactions to uncertainty can have a major impact on how perceived service quality affects customer satisfaction. This article addresses the issue of cultural differences in the context of business-to-business relationships. A study involving 303 Spanish, German, and Swedish business-to-business customers reveals that clients from cultures with a high degree of uncertainty avoidance were less satisfied than low-uncertainty avoidant clients when, as a result of a service defect, their service expectations were not met. In light of the tolerance zone concept, the finding suggests a narrower range of acceptable outcomes for high-uncertainty avoidance cultures. Important management implications of this study relate to service quality efforts, which should be explicitly designed to reflect intercultural differences in operations planning and training of service personnel.

Keywords: *perceived service quality; customer satisfaction; cultural values; uncertainty avoidance; business-to-business*

Driven by the current rapid pace of internationalization of service firms, a number of studies have examined the varying perceptions of service quality in different cultures. Perceived service quality for several services has been found to vary greatly among people from different cultures (Donthu and Yoo 1998; Furrer, Liu, and Sudharshan 2000; Liu, Furrer, and Sudharshan 2001; Raajpoot 2004; Voss et al. 2004). For example, anecdotal evidence suggests that tolerance to waiting varies widely between cultures. After the opening of Disneyland Paris, it was reported that members of various countries behaved very differently in queues for the rides. While some guests were waiting patiently in line, others accessed rides through ride exits to avoid queuing (Jones and Peppiatt 1996). The case of Wal-Mart's failure in the German retail market is also related to that retailer's lack of understanding of cultural differences (Knorr and Arndt 2003). For instance, many German customers perceived the introduction of American-style greeters to Wal-Mart's stores as superficial friendliness

(Witkowski and Wolfenbarger 2002). Even for companies that have no plans to leave their home country, there are obvious benefits to understanding the perspectives of their local customers who come from different national cultures.

Prior research on services holds that the ultimate goal of a service provider must be to exceed customer expectations and, thus, to increase the level of customer satisfaction (Parasuraman, Zeithaml, and Berry 1985, 1988; Voss et al. 2004). However, previous research has not addressed how perceptions of service quality, particularly service defects, are affected by uncertainty avoidance; that is the degree to which cultures try to avoid uncertain situations, for example, by means of rules or rituals (Hofstede 2001). In particular, the role of

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uncertainty avoidance as a moderator of the relationship between service quality and customer satisfaction is not yet fully understood despite calls for further testing of this position (Van Birgelen et al. 2002). Closely related to this issue is the need to understand the influence of uncertainty avoidance on customer tolerance zones—two ideas that yield conceptual similarities. Addressing these two issues is the main focus of this article.

The article is organized as follows: First, we present the conceptual background for service quality and customer satisfaction, tolerance zones, and cultural value differences. Next, we integrate these domains to develop our hypotheses. Then, we introduce the methodology of our empirical study and present our results. This section is followed by research implications and, last, practical implications for service managers.

Conceptual Background

Service Quality and Customer Satisfaction

Customer satisfaction is a key consequence of service quality and can determine the long-term success of a service organization (Parasuraman, Zeithaml, and Berry 1994). In general, customer satisfaction is affected by customer expectation or anticipation prior to receiving a service and can be approximated by the following equation: Customer Satisfaction = Perception of Performance – Expectations (Oliver 1980). When translated to services, a distinction between service quality and customer satisfaction needs to be made (Parasuraman, Zeithaml, and Berry 1988). Furthermore, one must differentiate between service expectations and service perceptions. While service expectations are a combination of a customer's predictions about what is likely to happen during a service transaction as well as the wants and desires of that customer, service perceptions can be defined as a customer's global judgments or attitudes, which relate to the superiority of a service (Oliver 1981; Parasuraman, Zeithaml, and Berry 1988). For example, in a business-to-business relationship, a customer expects the delivery of a chemical product to arrive in a certain amount of time (service expectation). The actual delivery time can be considered as the service perception. In consequence, faster or on-time delivery would be perceived as high service quality, though a slower delivery would be perceived as low service quality. We define service quality on the basis of the findings of Parasuraman, Zeithaml, and Berry (1988), who state, "Perceived service quality is therefore viewed as the degree and direction of discrepancy between consumers' perceptions and expectations" (p. 17). Besides these three constructs of service

expectation, service perception, and perceived service quality, the fourth concept is customer satisfaction, which is related to a specific transaction (Parasuraman, Zeithaml, and Berry 1988) and is directly affected by perceived service quality (Parasuraman, Zeithaml, and Berry 1994). Based on the above definitions, a service provider can increase overall customer satisfaction by either improving customer perceptions of a service or by lowering their expectations of it.

If a service is defective, however, service expectations were greater than service perception. Following this line of thought, a service defect can be defined as a negative deviation from a customer's service expectation. If a service provider fails to recover from a service defect, that defect may dissatisfy the customer at the time and, in turn, result in his or her switching to alternative providers (McCullough, Berry, and Yadav 2000; Roos 1999).

Although the above equation (Service Perception – Service Expectation = Perceived Service Quality → Customer Satisfaction) may overly simplify the very complex relationship between perceived service quality and customer satisfaction, the equation is a valuable tool and a clear reminder that both factors of perceived service quality and customer satisfaction need to be managed and controlled by the service provider.

Tolerance Zones

To understand the link between perceived service quality and customer satisfaction in detail, one can draw from the tolerance zone concept. This concept emerged from the literature on both service management and consumer behavior (e.g., Johnston 1995; Kennedy and Thirkell 1988; Oliver 1980; Swan 1988; Woodruff, Cadotte, and Jenkins 1983; Zeithaml, Berry, and Parasuraman 1993). A tolerance zone can be defined as "a range of service performance that a customer considers satisfactory" (Berry and Parasuraman 1991, p. 58). While service quality below a customer's tolerance zone will result in high dissatisfaction, service quality above the presumed tolerance zone will satisfy or even delight a customer (Berry and Parasuraman 1991; Davis and Heineke 1994). Johnston (1995) suggests three distinct tolerance zones. The first zone consists of customer pre-performance expectations, which can be *unacceptable*, *acceptable*, or *more than acceptable*. The service process—which is directly related to customer perception of service quality—is the second tolerance zone and can result in a *less than adequate* performance, an *adequate* performance, or a *more than adequate* performance. The third and final zone is the outcome state, producing a *dissatisfied*, *satisfied*, or *delighted* customer

(Kennedy and Thirkell 1988). Prior research also states that while marketing managers play an important role in influencing preperformance expectations, operations managers often play a key role in managing customer perceptions during service delivery (Johnston 1995).

The concept of tolerance zones is highly useful when trying to understand variability in customer service expectations and perceptions as well as customer satisfaction. Therefore, these zones can serve as a valuable diagnostic tool to determine perceived service quality (Kettinger and Lee 2005; Liljander and Strandvik 1993; Parasuraman, Zeithaml, and Berry 1994), although the concept has not been without controversy, mainly because of its conceptual vagueness (Teas and DeCarlo 2004).

Cultural Value Differences

The growth and spread of multinational service business on a global scale puts strong emphasis on the importance of integrating cultural elements in international service delivery (Donthu and Yoo 1998; Mattila 1999; Patterson, Cowley, and Prasongsukarn 2006; Voss et al. 2004). According to Hofstede (1997, p. 9), culture is “the collective programming of the mind which distinguishes the members of one group or category of people from another.” Based on this assessment, culture is not an individual characteristic; rather, it encompasses a group of people conditioned by the same education and life experience. Values, the most basic manifestation of culture, are defined as “broad tendencies to prefer a certain state of affairs over others” (Hofstede 1980, p. 19). Values are among the first things that children learn, not consciously, but implicitly through socialization. Since people are not consciously aware of the values that they hold, it is difficult to discuss or observe them precisely (Rokeach 1973).

Based on the receptivity to the idea of cultural values as an important factor for organizational success, however, the need for further intensified cultural value research became widely acknowledged. During the past two decades, many researchers have tried to make specific predictions of intercultural differences and their related behaviors (Hall and Hall 1990a, 1990b; Schwartz 1999; Trompenaars and Hampden-Turner 1998). The most comprehensive study to date on cultural differences in values was done by Hofstede (1980, 2001). Although this study was conducted in organizational settings, the values that Hofstede (1980, 2001) identifies have been associated with services (e.g., Enke and Reimann 2006; Furrer, Liu, and Sudharshan 2000; Liu, Furrer, and Sudharshan 2001; Voss et al. 2004). In this fundamental theoretical approach, Hofstede (1980) concentrated on four basic dimensions of cultural values on which selected countries were found to have different orientations.

These four dimensions are *the degree of power distance*, indicating the extent to which a society accepts the fact that power in institutions and organizations is distributed unequally; *the degree of uncertainty avoidance*, indicating the extent to which a society tries to avoid uncertain situations by, for example, establishing more formal rules and believing in, and/or striving for expertise; *the degree of individualism*, indicating the extent to which relationships are based on loose social frameworks rather than on collectivism and when people are tightly integrated into primary groups, such as families and organizations; and *the degree of masculinity*, indicating the extent to which dominant values or roles in society are viewed as “masculine,” for example, achievement, assertiveness, and performance, when measured against its opposite pole, “feminine,” defined as quality of life, caring for other people and also social and gender equality. Based on their research in Asia, Hofstede and Bond (1988) found a new dimension, which was later added to Hofstede’s (1997, 2001) research as a fifth dimension and labeled *the degree of long-term orientation*, indicating the extent to which a society exhibits a pragmatic future-oriented perspective rather than a conventional, historic short-time point of view. These five cultural value dimensions (Hofstede 1997; Hofstede and Bond 1988) can be used to make important predictions of intercultural value differences, including perceived service quality and customer satisfaction (Donthu and Yoo 1998).

We need to offer a few cautionary remarks here, however, since individual members of a culture may vary from the typical pattern of their own culture. Factors as divergent as socioeconomic status, educational level, occupation, personal experience, age, and gender can also shape the individual’s view of the environment. Thus, variations in customers’ perceived service quality might sometimes be caused by differences in individual behavior.

To understand the nature of cultures and their different behaviors, generalizing about common characteristics is unavoidable to develop a better understanding as long as one does not let these generalizations turn into stereotypes, represented by an oversimplified opinion, prejudiced attitude, or uncritical judgment. Despite these caveats, Hofstede’s (1980) cultural values dimensions do remain a valuable tool for understanding an individual’s fundamental cultural orientation.

Hypotheses Development

Prior research on perceived service quality reveals an increasing focus on cultural values and their influence on customer satisfaction, using Hofstede’s (1980) findings

or related cultural patterns (Burton 2002; Donthu and Yoo 1998; Furrer, Liu, and Sudharshan 2000; Liu, Furrer, and Sudharshan 2001; Voss et al. 2004).

While all of Hofstede's value dimensions certainly have an impact on different aspects of behavior, we believe that uncertainty avoidance orientation is the most important cultural value dimension related to defects in intercultural service quality. Reasons for the importance of uncertainty avoidance in conjunction with service quality can be found at the macro level of economies as well as at the micro level of consumer behavior. From a macroeconomic standpoint, as services become increasingly important to modern economies (Metters and Marucheck 2007), high uncertainty avoidance may hinder a service business actually being started and, thus, slow down the exploitation of new economic opportunities, especially in the service sector (Wennekers et al. 2003). Moreover, it can be argued that while other environmental variables such as economic, legal, or technological factors have been conformed among certain countries (e.g., member states of the European Union), differences in national culture have remained stable between nations (Hofstede 2007). On the level of consumer behavior, we agree with Wong (2004) that high uncertainty avoidance is likely to have a significant impact on repurchase intention because individuals with high uncertainty levels seek to minimize service defect potentials. Based on these arguments, we consider uncertainty avoidance to be especially critical to the study of service quality.

Uncertainty avoidance posits that humans reduce their inherent uncertainty by technology, law, and general rituals (Hofstede 2001). The degree to which uncertainty is generally acceptable within a given culture can, of course, differ greatly among countries. Hofstede (2001) measured the level of uncertainty avoidance on a scale from 1 (*very low*) to 100 (*very high*). Examples of national cultures with a low uncertainty avoidance index (UAI) include Singapore, with an UAI of 8, and Jamaica with 13. Examples of high-uncertainty-avoidance cultures are Belgium, with an UAI of 94, and Uruguay with 100 index points (Hofstede 2007). In his research, Hofstede (1980, 2001) compares low and high uncertainty avoidance in societies and uses the degree of uncertainty avoidance to distinguish between societal norms. With regard to beliefs, attitudes, and behaviors, *low uncertainty avoidance* refers to the following characteristics: low levels of stress and anxiety, weaker superegos and less showing of emotions, aggressive behavior being frowned on, greater tolerance and acceptance of diversity and uncertain situations, and a strong belief in general approaches and common sense to

problem solving, whereby people should be rewarded for innovative approaches.

Furthermore, commitments are less binding and relationships are built quickly, but they can also be dissolved as quickly; commitment also focuses on short-term planning (up to 5 years); rules and laws should be adaptive and changed if they don't work; there is greater acceptance of dissent; and there is willingness to take unknown risks. On the other hand, *high uncertainty avoidance* refers to higher stress levels and an inner urge to be busy; robust superegos and more showing of emotions; acceptance of aggressive behavior of self and others; less tolerance and acceptance of unclear situations; less acceptance of dissent and a strong need for consensus, clarity, and structure. In addition, there is a strong belief in expertise and knowledge for problem solving, and accuracy is rewarded; commitments are long-lasting, and relationships are built slowly and expected to last a long time; there is a focus on long-term planning (up to 20 years) and a strong need for and adherence to rules and regulations to make behavior predictable; there is also concern with security in life and knowing about risks (Adler 1997; Hofstede 2001; Lynn, Zinkhan, and Harris 1993).

Considering the differences described here between low- and high-uncertainty cultures, customers from cultures with a relatively high degree of uncertainty avoidance have a much lower tolerance for ambiguity (Hofstede 1980, 2001); that is, these customers do not accept unclear situations, and any deviation from the normal variation is not accepted as easily as it is by customers who come from cultures with a relatively low degree of uncertainty avoidance. A high UAI generally indicates higher anxiety and stress levels, a greater propensity to display emotions, and a tendency toward aggressive behavior when challenged (Hofstede 1980, 2001).

If a service provider interacts with a customer, there is very little chance to prevent a service defect when the customer encounters a situation or behavior that does not conform to his or her cultural expectations (Donthu and Yoo 1998). For example, if hotel customers with a high degree of uncertainty avoidance do not get their expected and reserved room at check-in, they may not accept any alternate arrangements without aggressive, emotional, and stressful behavior, which in turn may lead to a significant service defect. In such a situation, the service provider has to consider that the customers' degree of tolerance is so narrow that any deviation or scatter from the expected service will automatically lead to the perception of low service quality and, in turn, dissatisfaction. We follow Johnston's (1995) line of thought and

argue that if customer zones of tolerance are narrow (e.g., because of a high degree of uncertainty avoidance), then the service provider should identify and remove all potential defects. In addition, a high level of uncertainty avoidance calls for immediate and professional responses to service problems—an aspect that relates to the responsiveness dimension of service quality (Parasuraman, Berry, and Zeithaml 1988, 1990). Moreover, high-uncertainty-avoidance customers require clear structure as well as accuracy in the service process (relating to the reliability dimension of service quality; Parasuraman, Berry, and Zeithaml 1988, 1990). Based on these general comparisons, service providers can and should use Hofstede's (1980, 2001) UAI to integrate the customer in their operations. These providers need to define service quality for international customers in terms of cultural awareness and intercultural preparedness of service employees in addition to the more obvious business and organizational skills that their service employees should possess.

Based on this theoretical background and following the line of thinking of Nakata and Sivakumar (1996), we argue that customers of high-uncertainty-avoidance cultures will hesitate to choose uncertain situations or will even avoid them. Furthermore, following the tolerance zone concept, these customers have a much narrower zone of tolerance. Thus, we hypothesize the following:

Hypothesis 1a: The higher the degree of uncertainty avoidance, the less satisfied the customer will be when a service is defective, as when the expectation of the service was greater than the perception.

In contrast, customers coming from cultures with a relatively low degree of uncertainty avoidance have a much higher tolerance for ambiguity (Hofstede 1980, 2001). They see uncertainty as an inherent part of life and more easily accept each situation as it comes. A low UAI generally also indicates that customers with such a low index are more at ease, show less emotion, and frown on aggressive behavior. These customers will be more flexible and will not feel as threatened when encountering deviations from their expectation (Donthu and Yoo 1998). To use the same hotel example as before, if customers with a low degree of uncertainty avoidance do not get their expected and reserved room at check-in, they are more likely to accept a wider range of alternatives. Thus, a possible conflict can be contained to the level of fairness, flexibility, and common sense without producing a service defect. Even if all service expectations are not met, these customers are still able to come

away with a positive and satisfying service experience (Furrer, Liu, and Sudharsan 2000). If confronted with such a situation, the service provider can safely assume that their customers' tolerance levels are high enough to allow for certain deviations from the expected service and still perceive a high quality service.

Following these arguments, we state that low-uncertainty-avoidance customers are more accepting of uncertainty and, thus, have a wider zone of tolerance. Therefore, we offer the following hypothesis:

Hypothesis 1b: The lower the degree of uncertainty avoidance, the less dissatisfied the customer will be when a service is defective.

In summary, we argue that uncertainty avoidance moderates the perceived service quality–customer satisfaction relationship. For high-uncertainty-avoidance cultures, the effect of perceived service quality on customer satisfaction is stronger than it is for low-uncertainty-avoidance cultures.

Method

Sample

To test our hypotheses, 500 business-to-business customers of a global industrial gas company (55,000 employees; 12 billion euro sales; headquarters: Germany) were surveyed immediately after a service was delivered. The service incorporated the delivery of standardized industrial gases, such as oxygen and nitrogen, in different quantities. Customers originated in a diverse set of industries, which included (codes of the North American Industry Classification System [NAICS] in parentheses): fishing (1141); mining, quarrying, and oil and gas extraction (21); water supply and irrigation systems (22131); food manufacturing (311); paper manufacturing (322); glass and glass product manufacturing (3272); iron and steel mills and ferroalloy manufacturing (3311); welding and soldering equipment manufacturing (333992); and aerospace product and parts manufacturing (3364). There were 303 useable responses that resulted in a response rate of 60.6%. Customers originated from three different national cultures with three distinct levels of uncertainty avoidance (UAI shown in parentheses): Spain (86), Germany (65), and Sweden (29). Of the usable respondents, 34% came from Spain, 34% from Germany, and 32% from Sweden. Thus, the distribution of represented cultures was relatively even. We selected the specific countries to represent a

Table 1
Descriptive Statistics and Correlations for Study Constructs

Culture	Construct	Mean	Standard Deviation	Uncertainty Avoidance (Scale: 1-3)	Service Perception (actual delivery time—hours)	Customer Satisfaction (Scale: 1-5)
Spain (<i>n</i> = 103)	Uncertainty avoidance ^a	2.51	0.59	—	—	—
	Service perception	241.20	2.45	.02	—	—
	Customer satisfaction	2.54	1.60	-.02	-.91**	—
Germany (<i>n</i> = 103)	Uncertainty avoidance ^a	2.11	0.61	—	—	—
	Service perception	241.85	2.69	.02	—	—
	Customer satisfaction	3.79	1.05	.02	-.86**	—
Sweden (<i>n</i> = 97)	Uncertainty avoidance ^a	1.29	0.59	—	—	—
	Service perception	241.91	2.82	-.05	—	—
	Customer satisfaction	4.33	0.72	.09	-.77**	—

a. Own measurement

* $p < .05$. ** $p < .01$.

wide range of uncertainty avoidance (Hofstede 2001, 2007) and also due to availability of data.

Measures

Our survey instrument had the following parameters: To measure service expectations, the instrument used a precise delivery time of 240 hours. This delivery time was part of a standard delivery agreement in the business-to-business relationship and was also a common and constant practice across all customers and competitors. Service perception was measured based on the actual delivery time and was recorded by the focus company's service personnel immediately after the service was performed. Therefore, the difference between actual delivery time and expected delivery time (240 hours) yielded the level of perceived service quality. Accordingly, the longer the delivery time is, the lower the perceived service quality will be.

To measure the degree of customer satisfaction, we asked the following question: "In compliance with the achieved delivery time for this delivery, how satisfied were you with our service?" The response was based on a 5-point, Likert-type scale with responses from 1 (*not satisfied*) to 5 (*very satisfied*).

By giving a brief description of what uncertainty avoidance means and following the suggestions of Patterson, Cowley, and Prasongsukarn (2006), we also asked respondents to judge their society's level of uncertainty avoidance on a 3-point scale (1 = *low*, 2 = *medium*, and 3 = *high*) for a comparison with Hofstede's (1980, 2001) results. We used Hofstede's (1980) definition of

uncertainty avoidance: "The degree of uncertainty avoidance measures the extent to which a society tries to avoid uncertain situations by, for example, establishing more formal rules. Please rank the level of uncertainty avoidance in your society according to this brief description" (i-28). Interviewees had to self-report the specific culture in which they grew up (Spain, Germany, or Sweden). Originally developed and tested in the German language, the final survey instrument was translated and back-translated into Spanish and Swedish by native speakers to ensure proper comparability across countries.

Table 1 summarizes country-specific descriptive statistics and correlations for the three constructs measured in our study.

Results

We compared the results for the culture-specific uncertainty avoidance indices from our survey with Hofstede's (2007) index points. A Pearson correlation revealed a significant positive correlation coefficient of .647 ($p < .01$). The rating from our survey is, therefore, consistent with Hofstede's (2007) findings. Because of the high validity and reliability of Hofstede's (2001) uncertainty avoidance indices, we used them as the basis for the following analyses.

In addition, before testing our hypotheses, we conducted two preliminary analyses to test the independence of uncertainty avoidance and customer satisfaction. First, we conducted a χ^2 -test. As shown in Table 2, the χ^2 -test resulted in a high χ^2 of 141.94 ($p < .01$), suggesting an association between the two criteria.

Table 2
Results from the Chi-Square Test

	Customer Satisfaction					Total
	1 (<i>Very Satisfied</i>)	2	3	4	5 (<i>Dissatisfied</i>)	
Spain (UAI = 86)						
Observed count	19	20	0	23	41	103
Percentage	18.40	19.40	0	22.30	39.80	100.00
Expected count	32.97	30.25	12.92	12.92	13.94	
Germany (UAI = 65)						
Observed count	32	32	24	15	0	103
Percentage	31.10	31.10	23.30	14.60	0.00	1,100.00
Expected count	32.97	30.25	12.92	12.92	13.94	
Sweden (UAI = 29)						
Observed count	46	37	14	0	0	97
Percentage	47.40	38.10	14.40	0.00	0.00	100.00
Expected count	31.05	28.49	12.17	12.17	13.13	
Total observed count	97	89	38	38	41	303

($\chi^2 = 141.94$; $p < .01$).

Note: UAI = uncertainty avoidance index

To solidify this finding of dependence between uncertainty avoidance and customer satisfaction, a one-way ANOVA was conducted as an additional check on whether respondents' customer satisfaction varied in terms of the degree of uncertainty avoidance. As expected, there was a significant main effect for customer satisfaction, $F(3, 170) = 60.03$, $p < .001$, which supported the effectiveness of the "manipulation." Those customers with a high degree of uncertainty avoidance (Spanish) responded with a lower customer satisfaction ($M = 2.54$, $SD = 1.60$) compared to those customers with a medium to high level of uncertainty avoidance (German, $M = 3.79$, $SD = 1.05$) or low uncertainty avoidance (Swedish, $M = 4.33$, $SD = .72$). Both the χ^2 -test and ANOVA supported an association between uncertainty avoidance and customer satisfaction.

We next tested the hypotheses. Given the same service expectation among all customers (240 hours delivery time), Hypothesis 1a predicted that customers from cultures with a high degree of uncertainty avoidance (in this case, Spain), would be less satisfied when their service is defective. Conversely, we argued that low uncertainty avoidance customers (Swedish) would be still satisfied even if the service is defective (Hypothesis 1b). To test these hypotheses, we conducted a moderated regression analysis. While the self-reported customer satisfaction was the dependent variable, uncertainty avoidance, service perception, and the interactions between the two were treated as independent variables. Service perception was the actual delivery time, which could deviate from the agreed on and, thus, expected delivery time of 240 hours.

Table 3
Results of Moderated Regression Analysis ($n = 303$)

	β	t	p
Constant	93.49	25.38	.00
Uncertainty avoidance	-.57	19.75	.00
Service perception (actual delivery time)	-.69	23.94	.00
Interaction term between uncertainty avoidance and service perception	-.26	9.19	.00

Note: Standardized coefficients are shown here. Dependent variable is customer satisfaction. $R^2 = .76$; $df = 3$; $F = 307.03$; $p < .01$

As suggested by several authors (Aiken and West 1993; Cohen et al. 2002; Homburg and Fürst 2005), we standardized the predictor variables by mean centering. We then computed an interaction term by taking the product of the mean-centered predictor variables. Table 3 summarizes these results. The results suggest that the relationship between service perception (here, actual delivery time) and customer satisfaction was moderated by uncertainty avoidance. Therefore, we find that the higher the uncertainty avoidance, the stronger will be the effect of perceived service quality on customer satisfaction.¹

Finally, we conducted a multigroup analysis using regression analysis to condense the aforementioned findings and test whether group differences (i.e., between Spanish, German, and Swedish customers) were significant. As illustrated in Table 4, the results from a regression analysis

Table 4
Results of the Multigroup Analysis

	Sweden (<i>n</i> = 97)			Germany (<i>n</i> = 103)			Spain (<i>n</i> = 103)		
	β	<i>t</i>	<i>p</i>	β	<i>t</i>	<i>p</i>	β	<i>t</i>	<i>p</i>
Constant	51.63	12.75	.00	84.27	17.44	.00	145.68	22.00	.00
Service perception (actual delivery time)	-.77	-11.68	.00	-.86	-16.66	.00	-.91	-21.62	.00

Note: Standardized coefficients are shown here. Dependent variable is customer satisfaction.

suggest that Spanish customers were less satisfied than their German and Swedish counterparts when the same level of service quality was provided. Moreover, the analysis revealed that these group differences were significant between Sweden and Spain ($z = 3.35, p < .01$), Sweden and Germany ($z = 4.36, p < .01$) as well as between Germany and Spain ($z = 1.52, p < .10$).

In summary, the central finding of this study is that the degree of uncertainty avoidance as a cultural variable has a significant moderating influence on the perceived service quality–customer satisfaction relationship. It was found that customers from cultures with a high degree of uncertainty avoidance do not accept a wider tolerance with respect to delivered service. Customers from cultures with a low degree of uncertainty avoidance, however, are more tolerant. These findings strongly support hypotheses 1a and 1b. Moreover, the findings are in line with prior research, which found that the tolerance-zone concept moderates the relationship between service quality and customer satisfaction. Thus, the higher the tolerance level, the higher customer satisfaction will be, even if service quality expectations are not met (Yap and Sweeney 2007).

Limitations and Avenues for Further Research

Although this study does provide a unique insight into the relationship between perceived service quality, customer satisfaction, and cultural values, some limitations have to be highlighted as well. In turn, we also provide avenues for further research. First, the study was conducted only for one specific service in the chemical industry. Other services might provide further insights into service quality. Second, conducting more research in other cultures is recommended. Thus, although the observed cultures represented a high, medium, and low degree of uncertainty avoidance, members of only three different cultures were interviewed for this study. Based on Hofstede and Bond's (1988) finding that uncertainty

avoidance provides inconsistent results among certain Asian cultures (which led to the introduction of the cultural value dimension of long-term orientation), further research in Asian cultures might provide additional insights. Third, we urge a closer investigation of the cohesion between cultural values and customer satisfaction. For example, cultural value dimensions of other researchers, such as Hall and Hall's (1990a) degree of timing (which differentiates between cultures that are working parallel on many tasks versus cultures that are working on one task at a time), should be taken into account as well. Fourth, individual differences, such as personality traits, might be considered in future studies. For example, Costa, Terracciano, and McCrae (2001) report robust gender differences in personality traits across cultures. Therefore, trait psychology might be considered a useful complement to cultural differences (McCrae 2001) and intercultural service research.

Managerial Discussion

Our findings also have several important implications for service managers. For quite a while, cultural issues have been closely observed in terms of overall life and job satisfaction (Hofstede 2001). However, discussion on the influence of cultural values on service quality and customer satisfaction could still be augmented. While prior research indicates that problems occur because the performance of a service provider does not meet the expectations of a customer who has a different cultural background (Stauss and Mang 1999; Warden et al. 2003) and that culture must somehow thus play a role (Clark, Rajaratnam, and Smith 1996; Dahringer 1991; De Ruyter, Wetzels, and Lemmink 1996), the focus has not been on the control of service quality and customer satisfaction according to cultural values. Based on the study presented in this article, we have shown that uncertainty avoidance can have a significant influence on service businesses and that customers from different cultures react differently to a given level of service quality. These findings have three important implications for service management.

First, the study illustrates that major differences in customer perceptions of service quality across cultures do exist and, hence, should be appropriately reflected in service-process improvement efforts. Our findings clearly show that only a narrow service-quality tolerance band will be accepted by customers from cultures with a high degree of uncertainty avoidance. This means that service managers especially have to plan and aim for a defect-free process in high-uncertainty-avoidance countries, such as Spain in our case.

Second, new operational service planning for increased quality should include intense cultural awareness and intercultural preparation training for all service personnel involved. More specifically, training with a focus on Hofstede's (1980, 2001) cultural dimension of uncertainty avoidance must be seen as a critical strategy to achieve zero defects in intercultural service quality. Specially tailored intercultural training—including service quality factors such as tangibles, reliability, responsiveness, assurance, and empathy—can provide appropriate and useful approaches for adaptation to the different value systems and behaviors of international customers. This is especially valuable when this training focuses on the aforementioned uncertainty-avoidance differences being the result of different cultural backgrounds. The increased intercultural competence derived from such training not only gives the multinational service provider an excellent opportunity to fine-tune behavioral patterns but also helps to relieve much of the normal anxieties experienced when trying to integrate the external customer in a new cultural setting.

Finally, the results apply not only to companies that work internationally but also to companies that operate in one country or in a narrow geographic area (considering within-country or within-area cultural heterogeneity). Indeed, we suggest that all service companies consider including uncertainty avoidance in constructing a regional customer segmentation plan.

Note

1. Although our study focuses on service defects, one may argue that the proposed relationship between service quality and customer satisfaction also holds for exceeded service expectations; that is, in the case of earlier delivery, the customers may have experienced additional satisfaction (Berry and Parasuraman 1991; Davis and Heineke 1994). This idea is reflected by our results when splitting the sample into one group that received the service in equal to or less than 240 hours (as agreed in the standard delivery agreement) and a second group that received the service in more than 240 hours (a service defect). In both groups, delivery time had a negative and significant effect on satisfaction, ($\beta = -.36$ and $\beta = -.41$, for the first and second groups, respectively). Thus, we decided to include both the 93 customers with met expectations and the 210 customers with unmet expectations in our analysis.

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