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Stamolampros, P orcid.org/0000-0001-8143-7244, Dousios, D, Korfiatis, N et al. (1 more author) (2020) The joint effect of consumer and service providers' culture on online service evaluations: A response surface analysis. Tourism Management, 78. 104057. ISSN 0261-5177

https://doi.org/10.1016/j.tourman.2019.104057

The Joint Effect of Consumer and Service Providers' Culture on Online Service Evaluations: A Response Surface Analysis

Abstract

National culture exerts substantial influence on consumers' expectations, satisfaction, and evaluations. Despite that, within a service-based context, two cultures are met, that of the customer and that of the service provider,the existing literature systematically explores the effect of customer culture in isolation neglecting the impact of the provider's culture or their joint effect. We fill this gap by considering the concomitant effect of customer and provider cultural factors on passenger evaluations of airline carriers using a large dataset of reviews that covers the majority of countries. Employing a response surface methodology, our study provides significant advantages over methods based on cultural distance scores in revealing more complex non-linear relationships. This multi-dimensional approach provides new insights for assessing the impact of national culture on customers' service perceptions and evaluations, thus bringing significant implications for researchers and service providers.

Keywords: Cultural dimensions, Customer Satisfaction, Convergence of Cultures, Cross-Cultural Research, Response Surface Analysis

1. Introduction

The importance of national culture and cultural differences on customers' service expectations and their subsequent experience with service quality occupies a central theme in both tourism and marketing literature (Donthu & Yoo, 1998; Furrer, Liu, & Sudharshan, 2000; Gao, Li, Liu, & Fang, 2018). Research embracing the view that customers from different countries have varying levels of service expectations mushroomed with studies attributing these differences in perceived service quality (Liu, Furrer, & Sudharshan, 2001; Ert, Fleischer, & Magen, 2016), customer cultural background and behavioral intentions (Mattila, 1999; Stauss, 2016). Nevertheless, the debate remains riddled with inconsistencies. Recent attempts to empirically extend the role of culture and cultural differences have been inconclusive, for example, when exploring cultural influences on intercultural service encounters (Tam, Sharma, & Kim, 2016; Guesalaga, Pierce, & Scaraboto, 2016).

One aspect that is strikingly common in this stream of scholarly thought is the examination of cultural influences entirely under the prism of customer national culture. We argue that ignoring the national culture of the service provider is a critical neglect as the joint examination of both cultures may be important for better understanding their role in service evaluations. In service encounters, it has been shown that the interaction between customer and provider is an important determinant of overall satisfaction (Surprenant & Solomon, 1987), thus, considering only the national culture of the customer is a myopic approach that may explain discrepancies in previous research (e.g., Donthu and Yoo, 1998 and Furrer, Liu, and Sudharshan, 2000 report conflicting results about the effect of power distance). We aim to fill this gap by conjointly exploring the effect of both cultures on customer satisfaction within the context of airline services.

A common research design in service evaluations literature is to examine the impact of cultural differences between two or more countries that lie in the extremes of cultural dimensions continuum (e.g., Money & Crotts, 2003; Reisinger & Turner, 1997). Several limitations arise from this approach. First, variation in cultural dimensions is rarely used directly in explaining differences of the examined

variable (e.g., customer satisfaction) as the analyses are constrained to cluster countries in the extremes (e.g., Crotts & Erdmann, 2000; Donthu & Yoo, 1998). Second, the difficulty in collecting primary data from different cultures permits the examination to a limited number of countries (e.g., Landauer, Haider, & Pröbstl-Haider, 2014 investigate the effect of culture on British and Spanish tourists). However, observed effects on particular country pairs may be the result of other country-specific characteristics challenging the veracity of existing literature (Brouthers, Marshall, & Keig, 2016). Third, previous research neglects the service provider culture and its interaction with customer culture. A limited number of studies that consider cultural distance effects (e.g., Stamolampros & Korfiatis, 2018) rely on measures that aggregate the discrepancies across the cultural dimensions, therefore, the impact of each dimension individually is not investigated. Finally, cultural trait and differences are strictly hypothesized to have linear effects on customer evaluations (e.g., Huang & Crotts, 2019).

This study proposes a comprehensive approach to investigate the association between cultural dimensions and service evaluations addressing the above limitations that synthesize the knowledge gap. Using the aviation industry as a context, we explore a sample of online reviews from passengers originating from 203 countries (and territories) for airlines domiciled in 147 countries. When matched with Hofstede dimensions scores, our dataset covers the clear majority of cultures and offers an unprecedented opportunity to study this relationship with an extensive dataset including 733 reviewer-culture/airline-culture pairs. Such representativeness is extremely difficult to be achieved with a tool other than online reviews or in a different sector from airlines.

Another departure from previous literature is that we do not rely on cultural distance difference scores, an approach that comes with several drawbacks (for a discussion see Edwards, 2002). Instead, we employ an alternative method, namely polynomial regression with response surface that addresses such limitations. Response surface analysis permits the examination of cultural agreement/disagreement (or congruence/incongruence) between the reviewer and the airline company as determinants of customer satisfaction, considering linear/nonlinear associations and interactions. To alleviate concerns related to particular passenger/service provider characteristics that may drive the review rating and the

perception of service encounters, we employ several controls and perform a battery of robustness checks. In addition to the overall customer satisfaction, we also examine how various service aspects are affected by passenger/airline cultural traits with emphasis on customer service.

To the best of our knowledge, this is the first study that explores the effect of service and customer culture confluence in this context of inquiry. In addition, this is the only study to date that empirically demonstrates the joint effects of culture on service evaluation using an extensive and representative sample. This approach is fundamental for normative theory development and involves several managerial implications that could ameliorate customer dissatisfaction in service encounters and enhance service quality.

The rest of this paper is organized as follows: Section (2) describes the theoretical framework and hypotheses. Section (3) presents the methodology and variables used. Section (4) provides the empirical results along with robustness checks. Discussion and implications of the findings, limitations and potential avenues for future research are found in Section (5).

2. Theoretical framework

2.1. Customer satisfaction as a cognitive-affective process

A customer's satisfaction represents a function of expectation-disconfirmation and the extent the perceived quality of a product or service deviates from pre-purchase expectations (Anderson & Sullivan, 1993). When a consumer's a posteriori knowledge meets or surpasses her pre-purchase expectations, this results in satisfaction and positive word-of-mouth (WOM). Conversely, negative disconfirmation leads to dissatisfaction, generating switching, complaining and negative WOM, three well-documented behavioral responses (Oliver, 2014; Zeithaml, Berry, & Parasuraman, 1996; Knox & Van Oest, 2014). In particular, when consumers ascertain that the actual encounter is below expectations, they experience post-decision dissonance or post-decision regret. Both are important when consumers engage in post-choice evaluation of service encounters. The former has both cognitive and affective underpinnings, reflecting the feelings, emotions, and attitudes of consumers in post-purchase situations (Montgomery

& Barnes, 1993). The latter generates either cognitive dissonance for a service relationship (Davvetas & Diamantopoulos, 2017) or, in a transactional setting, regret for an aspect of the experience (Voorhees, Baker, Bourdeau, Brocato, & Cronin Jr, 2009) urging consumers to explore alternatives in the future.

Assuming that all individuals have identical expectations, desire the same attributes, and perceive the same quality for a product or service is a massive hypothesis. This view echoes Parasuraman, Zeithaml, & Berry (1985) who argue that consumers' level of satisfaction varies with quality. In the same spirit, norms and beliefs induced by national culture have been found to exert significant influence on shaping perceptions, dispositions, and behaviors (Markus & Kitayama, 1991). Most importantly, it has been shown that cultural values are more enduring than secondary beliefs (Hofstede, 1984) and impact the decision-making process of individuals (Kacen & Lee, 2002).

The perceived quality component, though, is determined by the actual product or service specifications established by firms (e.g., Parasuraman et al., 1985). This relates the actions of firms and the quality of the product or service delivered with the confirmation/disconfirmation process of customers' expectations. To this end, national culture is also expected to play a key role in the offered quality through its effect on business practices, which in turn could affect the perceived performance or even trigger a customer's affective disposition towards a firm or a brand. This affective response is in line with the research that recognizes satisfaction as a cognitive-affective process and expands the expectation disconfirmation paradigm to include emotions (Caro & García, 2007; del Bosque & San Martín, 2008).

2.2. Service encounters and provider-customer culture

Service encounters echo the social interaction between customers and the firm (Bitner, 1990) with evaluation of the service experience reflecting the degree of satisfaction with the exchange. It is not unreasonable to assume that this interpersonal transaction behaves reciprocally (Cropanzano & Mitchell, 2005), as for service providers customer satisfaction is viewed as the trade-off between rewards and costs from offered services (Akamavi, Mohamed, Pellmann, & Xu, 2015; Oliver, 2014). It

is argued in the literature that customer satisfaction leads to increased repurchase intentions (Hellier, Geursen, Carr, & Rickard, 2003). Therefore, prioritizing excellence in service provision to achieve customer satisfaction is not a surprising strategy by service providers as this can be a source of competitiveness (Grönroos, 2000).

Due to its experiential nature, service encounter satisfaction is critically determined by the interaction between the customer and the service provider, defined as the difference between customer expectations and perceived service quality (Pikkemaat & Weiermair, 2001; Cadotte, Woodruff, & Jenkins, 1987; Parasuraman, Zeithaml, & Berry, 1988; Parasuraman et al., 1985). As discussed earlier and in line with Boulding, Kalra, Staelin, and Zeithaml (1993), perceived service quality is a blend of prior expectations and actual service performance. Thus, there is an underlying association between the formation of customers' expectations, satisfaction and firm responses. As both parts in a service encounter and their expectations and perceptions are involved in this transactional setting, it is safe to assume that factors that can mold their standards and actions, such as national culture, have a profound function. We expect that services in an international context make the national culture effects more pronounced. For example, an inter-cultural service performance disconfirmation has a higher propensity to occur when the service performed by a company from one culture is seen as inadequate by a customer from another culture, due to expectations having been developed by each transactional entity in their respective home cultures.

2.2.1. Conceptualizing culture and Hofstede's cultural dimensions

Culture reflects an archetypal understanding of how social behavior is organized and can be defined as "*the collective programming of the mind distinguishing the members of one group or category of people from others*" (Hofstede et al, 2013, p.6). Geert Hofstede's work primarily explores national culture as traditional ideas attaching values through a framework of four distinctive dimensions which reflect cross-cultural interaction and the effect of societal values on the behavior of its members (Hofstede, 1984). Subsequently, Hofstede, Hofstede, & Minkov (2010) extend the framework and the original sample to incorporate two additional dimensions. Despite alternative cultural paradigms are discussed

in the literature, Hofstede's framework enjoys universality and consensus. An overview of the six cultural dimensions is briefly presented below:

Power Distance: Power distance is defined as "*the extent to which less powerful members of institutions and organizations within a country expect and accept that power is distributed unequally*" (Hofstede et al., 2010, p.61). In high power distance societies, individuals tend to be more respectful and obedient to hierarchy tolerating inequalities among its members.

Individualism/Collectivism: Individualism describes loose ties between the members of a society. People from individualistic countries take care only of themselves and their families. On the contrary, the common interest is more important than the personal interest in collectivistic cultures which promote tightly-knit societal frameworks and in-group integration of individuals and value belonging, harmony, conformity, and forgiveness.

Uncertainty Avoidance: Societies that score high in this dimension endeavor to minimize "surprises" and deviation from the norms that impose specific rules and behavioral codes. People from societies that score low in uncertainty avoidance have low stress and anxiety, are comfortable with taking risks and adapt quickly to new situations. On the other hand, high uncertainty avoidance societies exhibit high levels of stress and anxiety and are hesitant to adopt new technologies considering the "different" as dangerous.

Masculinity/Femininity: Masculinity refers "*to the division of emotional roles between women and men*" (Hofstede 2011, p.8). In masculine societies "tough" values, such as assertiveness, success, competition, ambition, and excellence dominate "soft" values, such as solidarity and nurturance, while an opposite attitude is observed in feminine societies which appreciate resolution, willingness to negotiate and compromise.

Long-Term Orientation/Short-Term Orientation: Long-term/short-term orientation is "*related to the choice of focus for people's efforts: the future or the present and past*" (Hofstede, 2011, p.8). Long-term oriented societies have more perseverance and expect effort to create slow/sustainable

results, have respect for circumstances and the distinction between what is right or wrong depends on them. People from long-term oriented countries are concerned about their adaptability and are willing to accept more than one truth in explaining the situations. On the other extreme, short-term oriented societies have a preference for quick results, they believe that there are specific guidelines about what is right or evil and they accept only one truth as valid.

Indulgence/Restraint: Indulgence/restraint is "*related to the gratification versus control of basic human desires related to enjoying life*" (Hofstede, 2011, p.8). People from more indulgent societies are happier, express easily their feelings, adopt a more positive and optimistic attitude and more likely recall positive emotions. People from restrained societies, on the other hand, are less happy, less likely to remember positive emotions and openly express their feelings.

2.2.2. Customers' national culture and its effect on service encounter evaluations

Section 2.1 presented the underlying theoretical framework that allows the association of national culture with consumer satisfaction through the confirmation/disconfirmation channel and its effect on molding customers' expectations and perceptions. This relationship is well-established in the literature (e.g., Donthu & Yoo, 1998; Furrer et al., 2000; Gao et al., 2018). Due to service encounters' intangible nature, consumer behavior literature suggests that culture has a more profound impact on post-purchase behaviors (e.g., Schiffman & Kanuk, 2007).

Several empirical studies support this idea. An early study of Winsted (1997) reveals significant cross-national differences in factors that determine the overall service encounters experience of American and Japanese customers. Donthu and Yoo (1998) find that customers' cultural orientation has a strong influence on their expectations from the overall service quality. Crotts and Erdmann (2000) offer further evidence about the effect of masculinity/femininity on service quality evaluations. Liu et al. (2001) draw inferences about the relationship between culture and behavioral intentions and find that customers from collective or high uncertainty avoidance societies are more prone to praise the good and less likely to complain about poor service experiences compared to customers from the opposite

extremes of these dimensions. Money and Crotts (2003) and Litvin et al. (2004) suggest that uncertainty avoidance represents a force that significantly impacts consumer decision-making in tourism services. Malai and Speece (2005) identify cultural influences on perceived service quality and brand name and investigate a moderating effect between service quality, brand name, and loyalty. Straughan and Albers-Miller (2001) explore cultural dimensions as drivers of longer-term by-products of customers' satisfaction, such as loyalty, with their results revealing a negative association with individualism and a positive link with uncertainty avoidance in the context of domestic retail industry. It seems that there is scholarly consensus that culture influences customer expectations, their subsequent evaluations and behaviors with the list of published studies being inexhaustive.

The key elements behind each cultural dimension could infer hypotheses with particular directions regarding the effect on consumer service evaluations. More specifically, masculine societies, due to their focus on excellence and ease with conflicts, are predisposed to be more rigorous when defining their expectations and evaluating their experiences than feminine societies. Customers that do not accept inequality are expected to be more critical and demanding when forming their expectations and assessing their experiences than customers who accept power and hierarchy. Individualistic customers, which care only about themselves and immediate family, are expected to be more demanding than collectivist counterparts that tend to consider the well-being of other members of the society as well, including service providers among others. Customers from countries with a high level of uncertainty avoidance are more anxious and stressed than customers from countries in the opposite extreme, therefore, they are expected to be less satisfied. Long-term oriented societies are flexible to their expectations allowing synthetic thoughts and accepting more than one explanations. Such societies tend to value the effort even if it does not generate immediate or the anticipated results. Consequently, customers from such backgrounds could be more favorable than short-term oriented customers who are concerned about the present and are interested in immediate outcomes. Finally, customers from indulgent cultures are expected to be more positive when evaluating service encounters due to their

generally positive stance in life and openness to "different" experiences, compared to customers from restrained countries.

While this battery of hypotheses is reasonable, empirical evidence in the literature reveal conflicting results that support opposite directions. For example, several studies report mixed results about the effect of power distance (Donthu and Yoo, 1998; Furrer, Liu, & Sudharshan, 2000). Inconclusive results are also found in further Hofstede dimensions (e.g., see Stamolampros et al., 2019; Huang and Crotts, 2019). Cultural differences among the customer and service provider is an explanation that gains ground among scholars (Reisinger & Dimanche, 2010). This interpretation is in line with the theory that allows the expectations of consumers and the responses of firms with the actual offered service to interfere with the service encounter evaluation process.

A standard approach in exploring cultural differences is to aggregate the cultural asymmetries between the two counterparts of the service encounter (e,g., Stamolampros & Korfiatis, 2018). While this approach exhibits that collectively such differences matter within this context of inquiry, it fails to provide a better understanding of the overall impact of customer and service provider culture on the evaluation process of service quality and the subsequent satisfaction. Most importantly, the difference score approach does not consider the cultural dimensions individually. In the same spirit, a cumulative body of research proposes that multi-dimensional models would be more appropriate to understand better the effect of culture in shaping attitudes, particularly in service encounters that involve intense customer interaction with staff (Hsu, Woodside, & Marshall, 2013; Jenner, MacNab, Briley, Brislin, & Worthley, 2008).

2.2.3 Service providers' national culture and its effect on service encounter evaluations

Scholars have long debated the effect of national culture on managerial practices, firm structure and value creation (Naor, Linderman, & Schroeder, 2010). In this stream of management literature, there are two dominant viewpoints. The convergence viewpoint posits that as nations become more industrialized, managers and firms will follow similar practices. The divergence viewpoint states that

the effect of national culture is strong and the value system of the workforce will remain unchanged (Naor et al., 2010; Reisinger & Crotts, 2010). Both viewpoints remain inconclusive justifying the context of this analysis.

Current literature fails to account for the propensity that service evaluations are regulated to some extent by the interaction with the service provider. The rationale behind this is that national culture could influence the final evaluation through the direct effect on several firm practices (e.g., interpretation of consumer needs to products or services). This could be materialized either through the cognitive or the affective property of customer satisfaction. The former is justified by the role of national culture in quality practices followed by firms (e.g., Lagrosen, 2003; Vecchi & Brennan, 2011). The link between customer satisfaction and service quality is clearly articulated in service research with evidence being also present in the tourism industry (e.g., Chen & Chen, 2010; Gallarza & Saura, 2006). Their distinction is traced to the assertion that service quality has an attitudinal, long-term evaluation perspective while customer satisfaction reflects a transaction-specific rationale (Caro & García, 2007; Wong, 2004). There is, however, the view that these, albeit conceptually distinct constructs, are related dominates (Shemwell, Yavas, & Bilgin, 1998).

In addition to their in-between association, both satisfaction and quality have been connected to customer loyalty (Wong, 2004; Chen & Hu, 2013; Bigne, Sanchez, & Sanchez, 2001; Yuksel et al., 2006). For example, a loyal customer could mitigate negative service encounter experiences focusing more on the exchange (Gundlach, Achrol, & Mentzer, 1995) and counterargue negative information (Ahluwalia, Burnkrant, & Unnava, 2000) proposing cultural values explanations (Malai & Speece, 2005) and providing evidence of the affective attribute of customer satisfaction. This channel could also be materialized through other actions pertinent to the service provider's national culture related to ethical behavior, advertising or involvement in corporate social responsibility (Husted, Dozier, McMahon, & Kattan, 1996). It is argued that such actions may trigger the affective response of consumer evaluation. For example, Whalen, Pitts, and Wong (1991) report a negative relationship between consumer perceptions of unethical firm practices and buying intentions. Gundlach and Murphy (1993) stress the

relationship-building qualities of ethical principles, while Choi and La (2013) demonstrate the significant effect that perceived corporate social responsibility has on customer trust and loyalty.

2.3. Hypotheses development

In this study, we argue that service providers' culture will determine the perceived quality of customers and their subsequent evaluations by its influence on the quality of product/service offerings and the firm's value-adding activities. Following this notion, cultural influences are not examined unidimensionally as originating only from customers, but providers' culture is also considered. Moreover, there is a focus on studying the cultural dimensions individually than at an aggregate level. Several interesting questions may arise from such an approach. For example, how are evaluations affected when customers from individualistic cultures who care about their own benefits and appreciate special treatment receive services from providers originated from collectivistic cultural backgrounds who perceive that all customers should be equally treated? Alternatively, what is the impact on service evaluations when short-term oriented customers who care about quick results interact with short-term oriented service providers who for the sake of current profits may sacrifice long-run relationships with customers? These questions demonstrate not only that individual cultural traits could have a distinct effect on consumer evaluations that is worth further investigation, but also that the established empirical approaches measuring customer/service provider cultural effects and interactions collectively with difference scores between the two service counterparts' cultures may not be adequate to unveil cultural influences fully.

Given the potential implications, the study suggests that culture incongruence between providers and customers be responsible for customer service satisfaction detriments. When customer cultural values do not fit well with those of the service provider, this may explain the negative attitudes towards the providing organization and vice versa. The examination of cultural dimensions under the prism of provider-customer culture polarities may give rise to a new understanding of the role of culture

in service evaluations. A notable point here is that we do not necessarily imply that the two cultures should be at their opposite ends for such phenomena to be observed.

In addition to addressing the knowledge gap that calls for a joint examination of customer and service provider cultures as a driver of service satisfaction and a distinct consideration of the cultural distances without relying on aggregated cultural difference scores, we deal with further limitations of the existing literature. As aforementioned, our sample of online reviews from airlines around the world is more representative allowing for generalizations of our findings in comparison with studies that limit their analyses to a small number of countries. Moreover, our methodological approach allows the delineation of more complex relationships between culture and service satisfaction without imposing linear effects. We, then, develop testable hypotheses for each cultural dimension.

The link between customers' power distance, service expectations, and perceived service quality reflects a "*differential power*" between service providers and consumers (Gao et al., 2018). Donthu and Yoo (1998) argue that passengers from countries that score high in power distance are expected to show respect to the authority and scholarship of the service provider leading to more favorable evaluations. Likewise, Furrer, Liu, and Sudharshan (2000) report that "weak" customers from high power distance cultures are more likely to tolerate failures from more "powerful" service providers. Donthu and Yoo (1998) also point out in this direction supporting that consumers low in power distance have higher overall quality expectations, while service providers from high power distance cultures are expected to show respect to the power of customers adopting a more customer-centric philosophy and following nationally-agreed cues such as ethical behavior (Kim & Aggarwal, 2016; Westerman, Beekun, Stedham, & Yamamura, 2007).

Problems and conflicts may arise when both the customer and the service provider are from countries that score low in power distance where the former does not accept the power of the latter, therefore, being more averse to failures in the service encounters and the latter is more likely to be less respectful towards customers. Therefore, we examine the following hypothesis:

Hypothesis 1 (H1): *The minimum satisfaction is expected when customers from countries that score low in Power Distance meet providers from countries that score low in this dimension.*

Customers from uncertainty avoidance countries dislike surprises and unscheduled events and are reluctant to changes. Donthu and Yoo (1998) discuss that such customers, who subject to their risk-averse nature are inclined to examine the attributes of products and services carefully, have a propensity to develop higher expectations. Likewise, Voss et al. (2004) document a negative relationship between customer evaluations and uncertainty avoidance. Reimann, Lünemann, and Chase (2008) also find evidence that clients from uncertainty-averse countries are less satisfied when their expectations are not met due to service defects than those from low uncertainty avoidance countries. Liu et al. (2001) examine both negative and positive experiences and conclude that customers from high uncertainty avoidance cultures have a higher intention to praise the service provider if they perceive a positive service experience but they become more critical with negative ones.

From the other side, service providers from low uncertainty avoidance countries may be more tolerant to schedule interruptions that may result in dissatisfied customers (especially customers from high uncertainty avoidance cultures). It is expected that those firms are more tolerant to unethical actions (Vitell, Nwachukwu, & Barnes, 1993). However, such behaviors can activate negative affective responses from customers. We expect the lowest degree of satisfaction to be achieved when consumers that do not tolerate negative surprises meet providers from countries that are more prone to such surprises:

Hypothesis 2 (H2): *The minimum satisfaction is expected when customers from countries high in Uncertainty Avoidance meet providers from countries that score low in this dimension.*

Customers from individualistic countries are expected to prioritize their utility maximization. Furrer et al. (2000) state that due to higher self-responsibility of individualism, customers from such countries are more demanding in their service consumption experiences than customers from collectivistic

societies. From the perspective of service providers, it has been found that firms in individualistic countries are more likely to follow illegitimate routes for success (Martin, Cullen, Johnson, & Parboteeah, 2007). Not surprisingly, when both parts in a service encounter are oriented towards maximizing their self-interest, there is a higher probability that their goals are in conflict. On the other hand, firms from collectivistic countries are more oriented towards meeting customer needs and expectations (Yilmaz, Alpkan, & Ergun, 2005). When both customers and service providers are from collectivistic countries, it is anticipated to care more about the satisfaction and the harmony of the group. Sharing a community spirit could possibly mitigate extreme responses from negative disconfirmation of expectations and perceived service quality. Therefore, we expect the following:

> **Hypothesis 3 (H3):** *The minimum satisfaction is expected when customers from countries that score low in Collectivism meet providers from countries that also score low in this dimension.*

In regard to masculinity, we expect that customers originally from countries that score low in this dimension will be more satisfied when they meet providers from countries scoring similarly. Service consumers from feministic countries are keener to avoid conflicts and have softer values such as loyalty and care, while those from masculine countries are more demanding for results and excellence. In line with this argumentation, Crotts and Erdmann (2000) report that airline passengers from masculine societies are more likely to report defector attitudes. Likewise, passengers from feminine societies have been found to be less likely to complain (Huang, Huang, & Wu, 1996). From a firm practice perspective, feministic service providers are expected to be more caring towards their customers needs, while those from masculine countries are more likely to engage in unethical behavior in order to achieve goals and rely on practices such as dishonest advertising and poor environmental sustainability and corporate responsibility (Christie, Kwon, Stoeberl, & Baumhart, 2003; Vitell et al., 1993; Ringov & Zollo, 2007). Therefore, when two cultures that score high in masculinity interact, there is an increasing probability of conflicts and lower satisfaction, proposing the following hypothesis:

Hypothesis 4 (H4): *The minimum satisfaction is expected when customers that score high in Masculinity meet providers from countries that also score high in this dimension.*

Customers from long-term oriented cultures, as aforementioned, are more likely to have a positive attitude. For long-term oriented providers, there exists a higher propensity to care about sustainability and perseverance. Maintaining their customer base and loyalty, thus, could be an important goal with such firms being more eager to satisfy their customer needs to secure a long-standing relationship. Future orientation also is associated with and promote continuous improvement (Naor et al., 2010). In this context, long-term oriented service providers will be more focused on offering high-quality services and reducing the gap between perceived quality and customer expectations leading to higher satisfaction. In short-term societies, service providers are particularly interested in current achievements, such as maximizing the profits per transaction (Ganesan, 1994). Not surprisingly, to achieve immediate results, such firms are highly likely to sacrifice service quality escalating the disagreement between customer expectations and perceived quality. Short-term oriented customers, on the other end, caring for their current self-interest are more likely to develop high expectations. Therefore, we propose the following hypothesis:

Hypothesis 5 (H5): *The minimum satisfaction is expected when customers from countries that score low in Long-Term orientation meet providers that also score low in this dimension.*

There are fewer studies in the literature investigating indulgence, the newest dimension to Hofstede's framework. The findings, hitherto, are more precise when considering the cultural effects on the maximum customer satisfaction level. This is explained as follows: Due to their happier nature and life attitude, customers from more indulgent societies are anticipated to be more optimists and more likely to recall positive emotions. One notable point here is that indulgent individuals are also more likely to express emotions. This sentimental approach in indulgent countries has also been found to impact service providers' understanding and empathy for customers' needs and expectations (Koc, Ar, & Aydin, 2017). More indulgent firms, hence, are expected to match customers' needs better. Customer

and service provider responses from restrained societies are not predictable in the same way due to their tendency to suppress feelings. We, then, hypothesize the following:

> **Hypothesis 6 (H6):** *The maximum satisfaction is expected when customers from countries that score high in Indulgence meet providers from countries that also score high in this dimension.*

3. Data and methodology

3.1. Description of data

We retrieved data from TripAdvisor's airline reviews section, where passengers review their experience with a specific flight. We collected all available reviews between January 2016 (the launch time of the airline reviews section) and August 2017. This information contained passenger/reviewers' location, flight date, name of airline, route (departure – destination city), cabin class, the overall rating, as well as specific service aspect ratings (*Legroom, Seat Comfort, Customer Service, Value for Money, Cleanliness, Check-in and Boarding, Food and Beverage and Inflight Entertainment/Wi-Fi Connectivity*). All ratings are ordinal values between 1 to 5 with the highest number denoting the highest satisfaction. Each review is accompanied by a profile description which contains location information (if available). Using the self-reported location of the reviewer and Google's location programming interface (API), we identified the country of residence of the passenger. Figure 1 provides an example of a review from TripAdvisor along with a description of the fields.

<Insert Figure 1 here>

In addition, TripAdvisor provides information about the registered headquarters of the airline carriers, which allowed us to match the airline carrier country. In a second stage, and as a cross-check, we validated the address with the registered authority of the carrier's airworthiness certificate. Excluding

passengers that do not report their location, we ended up with a sample of 557,208 reviews written by 376,519 passengers from 203 countries and territories that provide ratings for their flight experience with 489 airlines domiciled in 147 countries.

For the countries in our sample, we collect the respective cultural values from Hofstede's website.[1] The cultural values were initially computed for four dimensions based on a large dataset of thousands of IBM employees. In subsequent studies, the framework was updated and extended to additional dimensions and countries. Therefore, the cultural values of the current Hofstede framework consisting of 6-dimensions (as described in Section 2.2.1) are estimated based on 6 clusters of 4 questions for each dimension.[2] Compared to previous studies, our sample has the advantage that covers the majority of countries. Table 1 provides a description of the sample.

<Insert Table 1 here>

In our study, the response variable is the (mean) rating score (Z) that passengers from country p provide to airlines from country q. The joint effect of the underlying cultural traits is evaluated at a country level (country pairs: pq). Compared to the individual level, our aggregated (country pairs) analysis serves two purposes: First, Hofstede's dimensions are invariant for analysis at the individual level but vary across

[1] See https://www.hofstede-insights.com/product/compare-countries/

[2] The latest version of Hofstede's survey includes a total of 30-items. In addition to 24 questions (6 clusters of 4 questions for each dimension), 6 demographic questions are also included in the survey. The 5-scale Likert answers are averaged for each question. Then, the score, for example for Power Distance (PDI), is computed by plaguing this average in the equation PDI = 35 x (m07 – m02) + 25 x (m20 – m23) + C(pd). m02, m07, m20 and m23 are the mean scores for questions 02, 07, 20 and 23, respectively, and C(pd) is a constant that depends on the nature of the samples without affecting the comparison between countries. PDI scores can be rescaled between 0 and 100. More details about the questionnaire and the estimation of the cultural values can be found online at https://geerthofstede.com/wp-content/uploads/2016/07/VSM-2013-English-2013-08-25.pdf.

countries suggesting that this framework is best applied at the aggregate level (Beugelsdijk, Kostova, and Roth, 2017). However, as Donthu and Yoo (1998) discuss, the within-country variation of cultural traits is higher than the between-country variation. For example, the assumption that an individual from a country high in Uncertainty Avoidance has higher values in that dimension compared to an individual from a country low in Uncertainty Avoidance will lead to ecological fallacy and the inferences may not be valid. The probability of such a fallacy is higher when individuals are from countries with higher within-country cultural variation as it is more likely that the individual cultural score is far from the values that describe the society as a whole. By operationalizing the mean satisfaction score between country pairs as a response variable, we solve this issue as we expect that the aggregation of the rating score from a group of individuals is subject to cultural pressures and is representative of the Hofstede measures (a population of individuals should converge to the mean values). To this end, we set a threshold of at least 30 reviews for each country pair leading to 733 pairs that satisfy this prerequisite. Second, the aggregation leads to a computationally efficient model addressing potential convergence issues.

As described in Table 1, we also estimate the average flight distance (a proxy of service exposure) for each pair (in km) as a control variable of flight characteristics and the percentage of customers travelling in Premium Economy, Business and First classes (proxy of service level) and the level of contribution to TripAdvisor reviewing (proxy of reviewer experience) that will serve as controls of customer characteristics.

3.2. Polynomial regression with response surface analysis

A large stream of the literature in international business and marketing has explored the effect of cross-cultural distances using difference score measures such as those proposed by Kogut and Singh (1988). The general approach is to standardize the absolute differences over the total range of dimensions in order to produce a single metric. Other approaches employ the Mahalanobis distance which comes with the advantage that accounts for the correlation among the dimensions. However, difference scores

methods have inherent problems already discussed in the literature (see Edwards and Parry, 1993 for a discussion and a critique). More specifically, they suffer from reduced reliability, confounding effects, untested constraints, dimensional reduction, and conceptual ambiguity, among others (Edwards, 2002).

Polynomial regression analysis addresses these issues offering several advantages to existing research. First, it allows an extensive analysis of the relationships between the combination of firms' and customers' cultural dimensions as explanatory variables and customer satisfaction as an outcome variable. This empirical technique does not require aggregation of all cultural dimensions to a single metric (as difference scores do), therefore, disentangling the effects from differences in each Hofstede cultural dimension for firms and customers. In so doing, we attempt to alleviate conceptual ambiguity regarding the combined effect of both cultures (how the agreement, degree of discrepancy and direction of the discrepancy between the two cultures relate to customer satisfaction) and explain to some extent conflicting results in previous studies.

Second, it permits the consideration of linear and non-linear effects by modeling higher orders and interactions (Edwards, 1994). The linear regression analysis, thus, is extended to accommodate the effects resulting from a polynomial expansion by integrating interaction and curvilinear effects of the covariates into the regression framework. The second-order polynomial expansion of the differences, then, can be combined with a three-dimensional space representation (response surface) which allows us to capture more complex relationships among the variables of interest and test their statistical significance. More specifically, this representation allows for the modeling of the areas of agreement (line of congruence) or disagreement (line of incongruence) between the two primary covariates of interest and the response variable.

Several studies in marketing and service literature have utilized response surface methodology. Gabler et al. (2017) use polynomial regression and response surface methodology to assess the impact of varying levels of customer and selling orientation on frontline employees' outcomes. Likewise, Menguc et al. (2016) associate the quality of employee – colleague relationships with frontline employee outcomes. Richard et al. (2017) examine a related to our study research setting and evaluate the

congruence of store employee racial diversity with that of the community and their joint effect on sales performance.

The general Response Surface Analysis (RSA) model follows a two-step process. The first step involves second-order polynomial regressions that examine for each Hofstede dimension the effects of the combination of the two predictors of interest (culture of passengers from country *Y* and culture of airlines from country *X*) on the overall rating score (*Z*). The response variable, *Z,* is regressed on each of the two predictors (*Y* and *X*), their product (*XY*) and their squared terms (X^2 and Y^2) as follows:

$$Z = \beta_0 + \beta_1 X_i + \beta_2 Y_i + \beta_3 X_i^2 + \beta_4 X_i Y_i + \beta_5 Y_i^2 + \sum_{k=1}^{k=n} \gamma \Omega + \epsilon, \qquad (1)$$

where *Z* is the overall satisfaction score for the airline based in country *p* received from customers originated in country *q.* To avoid domestic bias influences (Balabanis & Diamantopoulos, 2004), pairs of customers and airlines from the same country are omitted from the sample. X_i is the Hofstede score of airlines for the *i-th* cultural dimension. Y_i measures the Hofstede score of passengers for the *i-th* cultural dimension. Ω is the vector of control variables including the flight distance, the travel class and reviewer experience (as described in 3.1.). All variables are mean-centered and scaled to aid interpretation (Edwards, 1994).

The second step of our analysis involves the computation of four surface coefficients to test for the congruence (agreement) and incongruence (disagreement) effects of the examined relationships as well as for the existence of curve-linear effects. Specifically, the slope of the *line of the perfect agreement* is defined as $\alpha_1 = \beta_1 + \beta_2$. Simply stated a statistically significant positive (or negative) a_1 suggests that the outcome variable (overall score) increases (decreases) when both predictors increase. The *curvature along the line* is assessed by $a_2 = \beta_3 + \beta_4 + \beta_5$. A statistically significant positive (negative) a_2 indicates an upward (downward) curve implying a positive effect on the outcome variable

with congruence between the two predictors. The surface test values $a_3 = \beta_1 - \beta_2$ and $a_4 = \beta_3 - \beta_4 + \beta_5$ test the *line of disagreement* (incongruence). The coefficient a_3 represents the direction of incongruence and its effect on the outcome variable. A positive (negative) a_3 reveals that when *X>Y (Y>X)* then the outcome is higher than in the case where *Y>X (X>Y).* The a_4 coefficient reveals the curvature across the line of incongruence where a positive (negative) coefficient indicates an upward curve (downward curve).

4. Results

We begin our analysis by examining the correlation matrix of the overall rating with the cultural dimensions of passengers and service providers reported in Table 2. The correlation analysis reveals that several cultural dimensions for both carriers and passengers have a statistically significant correlation with the overall satisfaction yet varying in magnitude or sign. Examining passengers' culture, Power Distance and Uncertainty Avoidance are positively associated and Indulgence is negatively correlated with the overall rating. The respective values for service providers' culture do not have a significant effect and/or differ in direction. The Long-Term orientation of the airline, though, seems to be significantly correlated with the satisfaction scores of passengers but the same association is not observed for the Long-Term orientation of customers. Cultural values for Individualism for both customers and carriers seem to be significantly associated with the overall satisfaction rating but may exhibit a different magnitude. Only values for Masculinity seem to comparably affect customer ratings. However, correlations are restricted to examine pairwise and strictly linear associations without controlling for the influence of other variables, the joint effect of both cultures and potential nonlinear effects.

<Insert Table 2 here>

In addition to the correlation analysis and in line with the methodology section, we perform polynomial regressions with response surface analysis to jointly test the confluence of providers' and customers' cultures on the overall service satisfaction. Our analysis was performed in R using the RSA package (Schönbrodt, 2017) . The results are displayed in Table 3.[3] The relationships are also depicted in 3-dimensional planes in Figure 2, where several interesting intuitions can be derived.

In particular, regarding the Power Distance dimension, polynomial regression coefficients reveal that both cultures have a significant effect on the overall score. While an insignificant coefficient (β_1) is found for the distinct linear effect of carriers' power distance on the passengers' overall rating which is aligned with the correlation analysis, the polynomial regression analysis reveals a strong negative association with the squared values ($\beta_3 = -0.045; p<0.001$). The effect for passengers' power distance is significant and positive at both level and squared values ($\beta_2 = 0.095; p<0.001$ *and* $\beta_5 = 0.037; p<0.01$). Checking the output for the response surface coefficients, we find a significant and positive coefficient ($\alpha_1 = 0.087; p<0.001$) indicating, that on average, an increase for this dimension in both cultures leads to an increase in the overall satisfaction. With regard to how the direction of the discrepancy impacts satisfaction, we find higher satisfaction when the power distance score for passengers is higher than that of carriers than vice versa ($\alpha_3 = -0.102; p<0.001$).

Further intuitions can be derived by the graphical representation which indicates the sensitivity of overall satisfaction to both cultures (the top left plane in Figure 2). We observe a strong effect of the passengers' power distance that exponentially increases with higher values. The relationship between carriers' power distance and overall satisfaction is described by a small concavity. The maximum satisfaction is achieved at higher values of power distance for the customer but medium values for the carrier. However, the effect of congruence is very strong at low power distance values where the

[3] All the procedural remedies related to the validation of the model assumptions, such as testing for collinearity and constant variance of the error term, were followed and no issues emerged.

minimum satisfaction is achieved when low power distant customers meet low power distant providers. As discussed in the hypotheses section, lack of respect for the authority either from the side of the passenger or the carrier increases the propensity of conflicts resulting in low customer ratings. Thus, H1 is supported.

The response surface analysis for Uncertainty Avoidance reveals that both the effects of the carriers' and passengers' cultures are positive and significant with customer satisfaction increasing more with high values (linear association) of the former and both high and low values (quadratic association) of the latter ($\beta_2 = 0.058;\ p<0.001$ and $\beta_3 = 0.069;\ p<0.001$). The response surface parameters reveal a complex association with positive effects for cultural congruence and incongruence on the overall score which increases when both dimensions increase ($\alpha_1 = 0.075;\ p<0.001,\ \alpha_2 = 0.066;\ p<0.01$ and $\alpha_4 = 0.083;\ p<0.01$).

The joint effect of cultures on the overall satisfaction is better reflected by the surface graph where we observe a curved wireframe plot that indicates statistically significant quadratic terms (top middle graph in Figure 2). The local minimum satisfaction is produced at the center of the 3-d plane for providers' uncertainty scores and at the low end of customers' scores. The maximum satisfaction is achieved at high uncertainty values for passengers and low scores for carriers. Overall, our findings are not in line with the particular directions hypothesized in H2, but they agree with the context of this analysis identifying significant effects on satisfaction scores from both cultures.

<Insert Table 3 here>

When it comes to Individualism, the effects are straightforward. The results of the polynomial regression show that this dimension has negative linear effects on the overall score from both providers' ($\beta_1 = -0.090;\ p<0.001$) and passengers' ($\beta_2 = -0.071;\ p<0.001$) cultures. Therefore, H3 is supported as the

relevant response surface coefficient indicates that increases in Individualism (or decreases in Collectivism) for both cultures are associated with lower overall satisfaction ($\alpha_1 = -0.161; p<0.001$). This relationship is also depicted in the upper right graph in Figure 2, where the minimum (maximum) satisfaction is achieved when passengers from individualistic (collectivistic) countries meet individualistic (collectivistic) providers.

The respective coefficients for Masculinity reveal significant linear and non-linear negative effects on satisfaction rating only from passengers' culture ($\beta_2 = -0.038; p<0.05$ and $\beta_5 = -0.018; p<0.05$). However, the response surface test supports H4 that moving from lower to higher values in the masculinity continuum for both passengers and providers leads to lower satisfaction ($\alpha_1 = -0.065; p<0.01$). This relationship is also depicted graphically in the three-dimensional plot suggesting passenger satisfaction is minimized when two masculine cultures are met. A local maximum is achieved with moderate passengers and feministic providers.

The findings for Long-Term orientation exhibit a significant positive effect only from the culture of providers, as revealed from the polynomial regression ($\beta_1 = 0.099; p<0.001$), supporting the purpose of this analysis. However, the response surface tests suggest that an increase in this dimension for both cultures leads to on average higher satisfaction ($a_1 = 0.084; p<0.001$). Also, a higher overall satisfaction is obtained when the airline carrier comes from a more long-term oriented culture than that of the passenger ($a_3 = 0.114; p<0.001$). When examining the three-dimensional plot for this dimension in Figure 2, we confirm the findings for the maximum point. We also conclude that when customers scoring low in long-term orientation meet short-term oriented service providers the overall satisfaction is minimized lending support to hypothesis H5.

<Insert Figure 2 here>

Finally, Indulgence, the latest addition to Hofstede's framework, reveals the most interesting insights. Both cultures appear to influence the overall satisfaction, but passengers impose convex effects (β_5 = *0.054; p<0.001)* and providers concave effects (β_3 = *-0.054; p<0.001)*. Passengers' culture has also negative linear effects on overall satisfaction (β_2 = *-0.058; p<0.001).* Indulgence is the only dimension that reveals a significant interaction between the two cultures (β_4 = *0.04; p<0.001)*. Response surface tests reveal that increases for both cultures in this dimension are associated with lower satisfaction (a_1 = *-0.041; p<0.001)*. Moreover, satisfaction is higher when Indulgence is higher for carriers than for passengers (a_3 = *0.074; p<0.001).*

The bottom right plot in Figure 2 demonstrates the complex association between combinations of cultures and their effects on the overall rating, in line with the conflicting results of the polynomial interaction coefficient and the response surface tests. Compared to all other cultural dimensions, Indulgence seems to generate the highest variation in the overall satisfaction and is most difficult to interpret. The surface plane reveals that when passengers from a culture with a very high or very low degree of indulgence meet service providers with moderate indulgence, the satisfaction maximizes. On the other hand, when customers with moderate indulgence meet providers from both the extremes of the dimension, it seems that the overall satisfaction drops at the lowest levels. While the results do not provide direct support for H6, the overall findings suggest that the combination of cultures consist of significant powers that govern the response variable.

4.1. Robustness checks

In order to assess the robustness of our results, we evaluate several alternative specifications. This is done in order to secure that our results are not driven by other factors or model misspecification. The first alternative model that is examined deals with our main dependent variable. The overall satisfaction can be considered as an aggregated measure of passenger satisfaction deriving from a multitude of service aspects, some of which are not affected at least to the same extent by cultural factors. For example, satisfaction from legroom and seat comfort, wifi connectivity and inflight-entertainment that

involve less human interactions is expected to be more insensitive to cultural effects than other service aspects. Thus, we employ as a response variable the rating that passengers provide for customer service in particular. The in-flight customer service may be more vulnerable to cultural influences compared to the overall score due to the direct human interaction. Our rationale is that firms impose practices and monitor their implementation by their employees, thus, firms' national culture has a direct effect on the interaction with customers.

Nevertheless, airline staff, especially the cabin crew in many cases is quite diverse comprised of employees from many different nationalities and cultural backgrounds. In such cases, employees' culture may be more dominant than the culture imposed by the firm increasing the likelihood that the observed effect will not be that of service provider's national culture but that of employees' national culture. To alleviate such concerns, our alternative model examines the satisfaction with check-in and boarding service aspects considering flights where the departure country is identical to the country of origin of the airline (primary hub) examining a subset of 471 country pairs. We argue that a noisy effect from differences between the cultural origin of companies and staff is less possible in this subsample as the common practice is that the national identity and culture of ground service employees will be identical to that of the airline.[4]

Our third alternative model attempts to deal with concerns regarding potential misalignments between the passengers' country of residence and country of origin. There are countries with a high percentage of foreign-born population, and in those cases, passengers' country of origin may differ from the country of residence. We believe that the existence of some countries with a high number of immigrants should not significantly distort our results because our sample represents most of the countries with the average percentage of the foreign-born population being relatively low. However, to

[4] Perhaps there are countries where even the ground service employees could be from different countries, but the noise is compared to the case of cabin crew.

mitigate such thoughts, we repeat our analysis excluding countries that have more than 10% foreign-born population based on the UN International migration report 2017.[5]

Our last approach deals with problems that may arise from the aggregation of the control variables used in the previous analysis. This approach could lead to a substantial loss of information. To address such concerns and since we have the relevant information for each reviewer, we follow a two-stage approach. In the first step, we regress the individual overall satisfaction to the control variables about specific flight or reviewer characteristics that may explain this score (such as cabin class, flight distance, and reviewer experience). The second step involves the same methodology used as in the baseline model, but instead of the average overall score as a dependent variable, we use the residuals of the first regression which capture the unexplained part of passengers' satisfaction to the control variables. The results from all robustness checks, reported in the appendix (Tables A1, A2, A3, A4 and Figures A1, A2, A3, and A4, respectively), remain qualitatively consistent with the main analysis.

Finally, we examine the sensitivity of our analysis to the selection of the cut-off point for the minimum required number of reviews per firm-passenger pair to be included in the sample. The selection of 30 reviews is somehow arbitrary and is mainly based on the Central Limit Theorem where the 30 observations act as a threshold. However, we also evaluate various alternative cut-off points of 50 and 100 reviews per pair of passenger country – airline country. To conserve space, the results are not tabulated but are available upon request. Overall, the findings remain unchanged

[5] UN International Migration Report (2017). Available at: https://www.un.org/en/development/desa/population/migration/publications/migrationreport/docs/MigrationReport2017_Highlights.pdf

5. Conclusions

5.1. Implications for theory

The core theme of this paper posits that there is a bilateral effect of both service provider and passenger culture on overall satisfaction. This is a novel assertion that positions this study at the center of a debate among scholars fueled by empirical discrepancies regarding the effect of customers' culture on their overall satisfaction from service encounters. Conflicting results are found by several studies. For example, Donthu and Yoo (1998) and Huang and Crotts (2019) report opposite effects of power distance on satisfaction. Donthu and Yoo (1998) offer also conflicting findings for the uncertainty avoidance dimension compared to Liu et al. (2001) and Voss et al. (2004). Mixed results are also found for individualism (see Huang and Crotts, 2019 versus the studies of Donthu & Yoo, 1998, Furrer et al., 2000 and Liu et al., 2001). This study suggests that failures of prior studies to accommodate also the effect of the service provider culture may be the source of these deviations.

Our approach conforms to the discussion of Brouhers et al. (2016) related to the various inconsistencies in cultural distance studies deriving from methods, sample bias or the number of dimensions used. Our study addresses most of these limitations and extends current scholarly thought by unmasking the effect of provider culture on overall satisfaction. By embracing polynomial regression analysis and response surface methodology, we shed light to the concomitant linear and non-linear effects of both customer and provider cultures (as opposed to the literature that focuses only on linear effects exclusively derived from customers' culture) with insights coming from an extensive sample of reviews from passengers and airlines from the majority of countries (as opposed to studies that employ limited samples). As such, we provide an alternative explanation along with the theoretical linkages that allow complex cultural effects that cannot be captured by studying customers' culture in isolation and neglecting service providers' culture.

5.2. Practical implications

Given the joint effect of consumer and service provider culture, our study provides clear practical value for airline carriers, passengers and review aggregator services. In particular, multiple implications are discussed from the perspective of service providers. *First,* it is important for principal decision-makers in airlines to acknowledge that service evaluations may be influenced by their own culture in addition to the culture of consumers. This is fundamental for interpreting consumer needs regarding service provision and provides a springboard for profoundly understanding the cultural powers that drive customer satisfaction. This can form a new source of sustained competitive advantage, deploying potential [cultural] sources of superior service experiences. Beyond industry-level changes, the joint cultural effect is a service attribute that airline service providers can control and no longer avoid.

Second, the concomitant effect between the airline service provider and consumer culture enables firms to align their value-adding activities to drive customer loyalty. This represents a departure from existing service evaluation practices which usually rely on customer satisfaction measured through cabin, front-line and onboard dimensions of service quality to propose minor improvements on the service provision. Our findings suggest that airline service providers must overhaul existing monitoring processes to capture the joint culture effect through the entire duration of the inter and intra-cultural service encounter.

Third, there are clear benefits for market segmentation on the basis of cultural congruence among firms and consumers. Our study demonstrates the mechanism upon which a segmentation strategy could be developed in line with recent calls to do so (Stauss, 2016). By linking firms' cultural characteristics to customer segments, this approach offers airline carriers a platform to prioritize/rank those cultural attributes that are aligned to their brand promise assisting thereof customer loyalty.

For consumers, practical implications are equally important. When consulting online reviews and in order to make an informed decision, they should primarily focus on the information provided by customers with similar cultural (and perhaps demographic) characteristics and avoid relying on a handful of reviews. A practical suggestion concerns review aggregator services, as their success and

profitability are based on the accurate depiction of the service experience. To inform consumer decision-making appropriately at the carrier selection stage, the concomitant cultural effect should be incorporated by allowing platform visitors to set screening filters on the basis of cultural profiles. These recommendations could also be extended to other service domains where reciprocal cultural exchange potentially shapes the service evaluation process (e.g., hotels and restaurants).

5.3. Limitations and Future Research

This study has several limitations, mainly attributed to the nature of online reviews. First, we cannot control for additional reviewers' demographics (e.g., income, sex, age, education) since such metadata are not collected by review platforms. However, our aggregated analysis (national groups than individuals) allows us to assume that the tested (customer – service provider) pairs have similar demographic characteristics on average. Second, another criticism in the extant literature is related to the invariance of Hofstede values. However, in the recent study of Beugelsdijk, Maseland, and Hoorn (2015), it is argued that this should not be an issue since cultural change is absolute rather than relative and countries' scores relative to the scores of other countries remain stable. Third, online reviews have been found to be prone to several biases such as self-selection (Li & Hitt, 2008) and response biases (Hu, Zhang, & Pavlou, 2009). While such concerns are valid, we conclude that our results are comparable to studies based on other measures used in empirical literature as they are also subject to similar biases (e.g., questionnaires also require the voluntary participation of the participants).

Finally, concerns for fake reviews and inaccurate information can be generally an issue when employing this data source. However, the review data for this study is retrieved from one of the most popular review aggregation platforms and pertained to the last two years where intelligent in-house mechanisms have been developed to capture fake reviews and comply with regulatory requirements which prohibit such behavior in many countries. As such manipulation of online reviews becomes more difficult. To this direction, we believe that the size of the companies in our sample is a reassuring factor that those companies will not resort to such practices given that the reputation loss if found will be larger

than the potential gain. However, even under the existence of such biases (for example the undisputed under-representation) given the significant effect reviews exert on customers' decision and subsequently on corporate performance, firms should be able to reliably gauze the determinants of satisfaction or dissatisfaction that drive customers' opinions and adjust their offering accordingly.

A point of departure for any future endeavor following this approach would be to attempt and replicate the results of this study in different service settings other than airlines. This would help us to validate the concomitant effect. Our study demonstrates that there is an intriguing interplay between consumer and service provider cultures that may explain disconfirmation(s) on settings that rely on inter-cultural exchange. Therefore, future research can move beyond the service exchange itself towards understanding a) the concomitant effect on service expectation formation, b) the joint culture effect on co-creation practices in service recovery, and c) the joint effect in services associated with business-to-business relationships.

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Index of Tables and Figures

Table 1: Sample characteristics

Total Number of Airlines	489
Total Number of Reviewers	376,519
Total Number of Reviews	557,208
Number of Countries (Reviewers)	203
Number of Countries (Airlines)	147
Number of Country Pairs (Passenger Country (p) – Airline Country (q))	733
Average Flight Distance (km)	4,215
% of Passengers in Premium Economy Class	2.77%
% of Passengers in Business Class	8.24%
% of Passengers in First Class	1.55%
Average Reviewer Contribution (experience in reviewing)	3.83

Table 2: Descriptive statistics and correlation matrix

	Mean (St.Deviation)	Rating	Power Distance (P)	Uncertainty Avoidance (P)	Individualism (P)	Masculinity (P)	Long-Term Orientation (P)	Indulgence (P)	Power Distance (A)	Uncertainty Avoidance (A)	Individualism (A)	Masculinity (A)	Long-Term Orientation (A)	Indulgence (A)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Rating	3.70 (0.44)	1												
Power Distance (P)	53.24 (19.5)	0.25***	1											
Uncertainty Avoidance (P)	64.58 (23.12)	0.13***	0.35***	1										
Individualism (P)	59.38 (23.96)	-0.16***	-0.70***	-0.27***	1									
Masculinity (P)	54.42 (17.72)	-0.08*	-0.12***	0.03	0.22***	1								
Long-Term Orientation (P)	50.87 (22.35)	0.01	0.20***	0.17***	-0.15***	0.21***	1							
Indulgence (P)	52.68 (18.00)	-0.14***	-0.53***	-0.34***	0.40***	-0.01	-0.54***	1						
Power Distance (A)	53.37 (19.02)	-0.02	0.08*	-0.06	-0.06	0.06	0.02	-0.03	1					
Uncertainty Avoidance (A)	59.81 (23.44)	0.03	0.01	0.10**	0.05	0.02	-0.05	0.03	0.13***	1				
Individualism (A)	53.42 (25.56)	-0.20***	-0.05	0.08*	0.02	-0.06	-0.02	0.01	-0.74***	-0.10**	1			
Masculinity (A)	50.65 (19.59)	-0.08*	0.07	0.03	-0.06	0.04	0.01	-0.02	-0.02	0.01	0.11**	1		
Long-Term Orientation (A)	51.23 (22.28)	0.24***	0.07	-0.04	-0.03	0.04	0.12**	-0.12***	0.08*	0.02	-0.09*	0.07*	1	
Indulgence (A)	51.41 (18.00)	0.04	-0.07	0.04	-0.01	-0.05	-0.16***	0.13***	-0.45***	-0.12***	0.41***	-0.06	-0.46***	1

*Notes: Column (1) presents the mean and standard deviation of the passengers' (P) overall satisfaction rating and cultural dimensions and the respective figures for the cultural dimensions of the Airlines (A). The correlation matrix is presented in columns (2)-(14).The total sample covers the period from January 2016 to August 2017 forming 733 (P)-(A) pairs (at least 30 reviews for each pair should be available). *p<0.05, **p<0.01, ***p<0.001 denote the level of significance.*

Table 3: Polynomial regression and response surface analysis. Dependent variable: Overall passengers score.

Variable	Power Distance	Uncertainty Avoidance	Individualism	Masculinity	Long-Term Orientation	Indulgence
Polynomial regression coefficients						
β_0	3.688 (0.024) ***	3.605 (0.026) ***	3.684 (0.032) ***	3.676 (0.021) ***	3.651 (0.026) ***	3.674 (0.024) ***
β_1	-0.007 (0.014)	0.017 (0.016)	-0.090 (0.015) ***	-0.027 (0.019)	0.099 (0.015) ***	0.016 (0.014)
β_2	0.095 (0.016) ***	0.058 (0.017) ***	-0.071 (0.016) ***	-0.038 (0.015) *	-0.015 (0.016)	-0.058 (0.015) ***
β_3	-0.045 (0.013) ***	0.069 (0.015) ***	0.023 (0.019)	0.020 (0.014)	0.017 (0.014)	-0.054 (0.011) ***
β_4	-0.004 (0.014)	-0.008 (0.016)	-0.006 (0.014)	0.003 (0.013)	-0.009 (0.015)	0.034 (0.016) *
β_5	0.037 (0.014) **	0.005 (0.015)	-0.028 (0.018)	-0.018 (0.009) *	0.011 (0.016)	0.054 (0.012) ***
R^2	0.09	0.04	0.07	0.02	0.06	0.08
Surface tests						
α_1	0.087 (0.020) ***	0.075 (0.02) ***	-0.161 (0.022) ***	-0.065 (0.025) **	0.084 (0.021) ***	-0.041 (0.019) *
α_2	-0.013 (0.021)	0.066 (0.023) **	-0.011 (0.030)	0.005 (0.021)	0.019 (0.024)	0.035 (0.019)
α_3	-0.102 (0.022) ***	-0.041 (0.025)	-0.018 (0.021)	0.011 (0.024)	0.114 (0.022) ***	0.074 (0.022) ***
α_4	-0.005 (0.024)	0.083 (0.030) **	0.000 (0.029)	0.000 (0.02)	0.038 (0.028)	-0.034 (0.028)

This Table displays in the upper panel the cofficients along with robust standard errors in parentheses of the polynomial regression expressed in Equation (1). The bottom panel displays the coefficients for the surface response tests. Controls for flight distance and passenger cabin class are also included but the coefficients are not reported. *N = 733* (Country pairs). * p<0.05, ** p<0.01, and *** p<0.001 denote the level of significance.

Figure 1 Example of online review

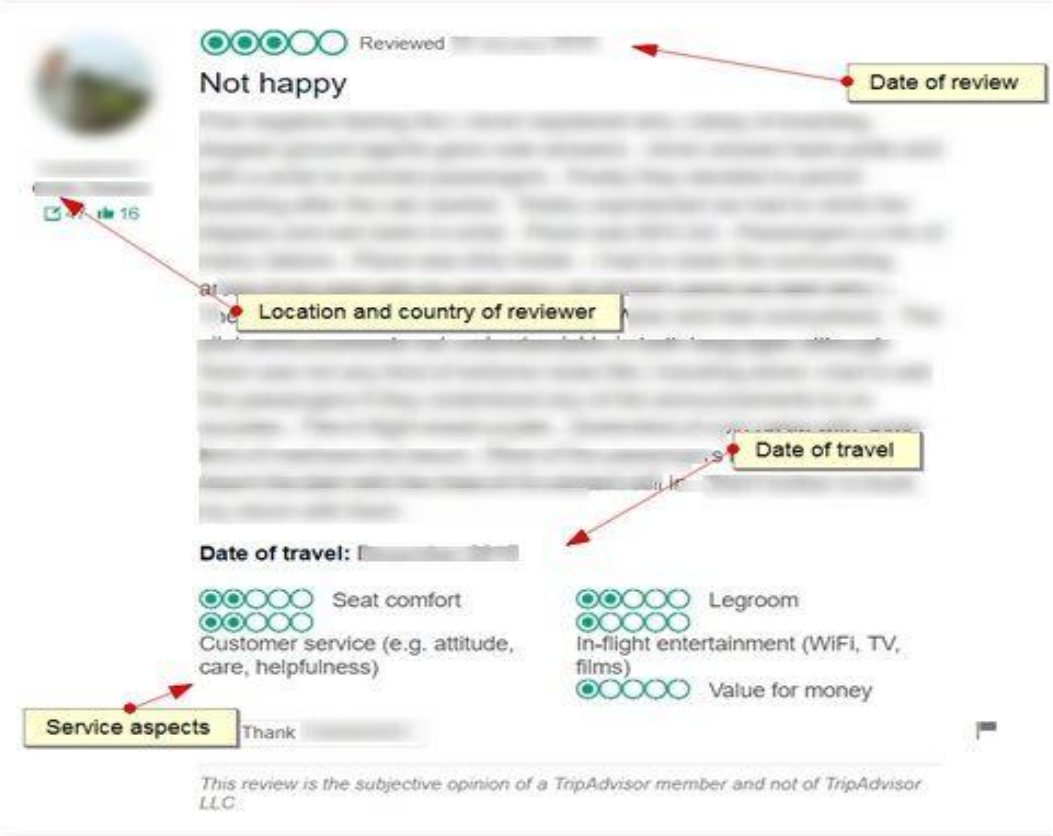
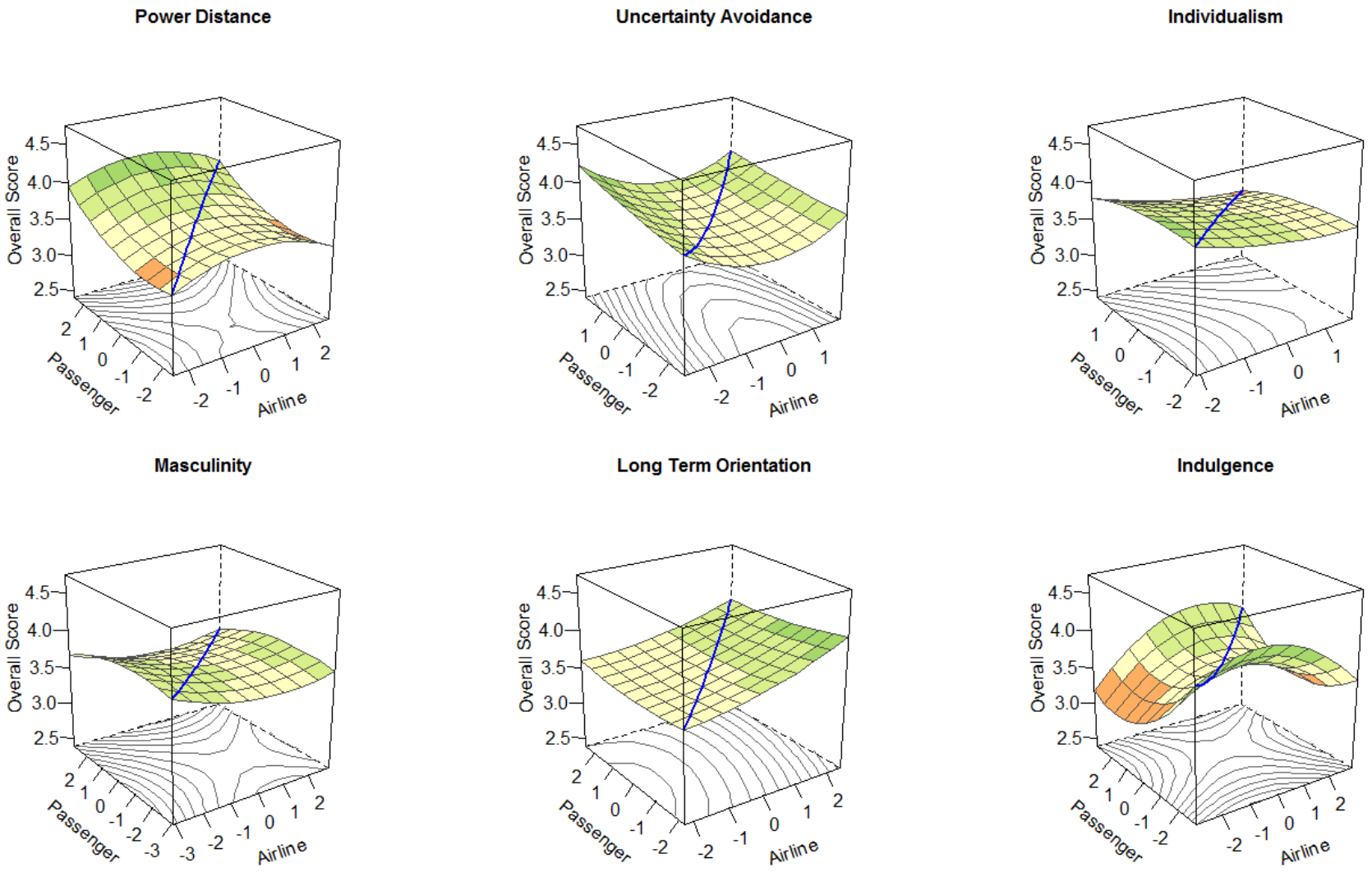


Figure 2 Three-dimensional representation of the combined effect of the passenger-airline cultural traits on the overall satisfaction: Response surface analysis graphs



Note: Country pairs = 733, the line depicted in blue is the line of agreement (or congruence). Contour plots are depicted at the bottom

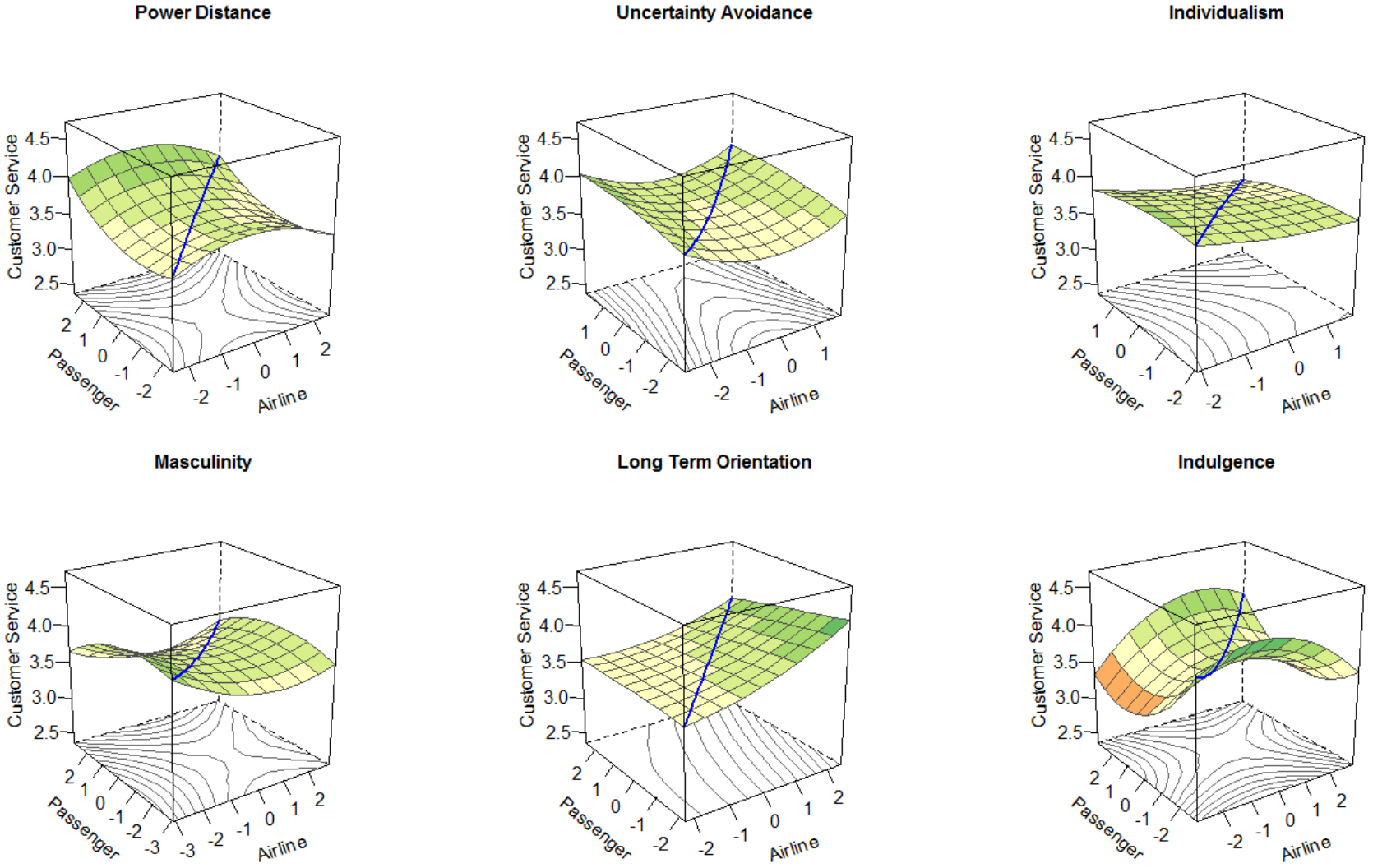
Appendix

Table A1: Polynomial Regression and response surface analysis with dependent variable the satisfaction score with customer service

Variable	Power Distance	Uncertainty Avoidance	Individualism	Masculinity	Long-Term Orientation	Indulgence
β_0	3.713 (0.025) ***	3.66 (0.027) ***	3.717 (0.033) ***	3.705 (0.022) ***	3.69 (0.026) ***	3.699 (0.024) ***
β_1	-0.018 (0.015)	0.031 (0.016)	-0.077 (0.015) ***	-0.029 (0.019)	0.115 (0.015) ***	0.014 (0.015)
β_2	0.077 (0.016) ***	0.046 (0.017) **	-0.051 (0.017) **	-0.052 (0.016) **	-0.037 (0.016) *	-0.039 (0.015) **
β_3	-0.046 (0.013) ***	0.06 (0.016) ***	0.017 (0.02)	0.031 (0.014) *	0.024 (0.014)	-0.053 (0.011) ***
β_4	-0.003 (0.014)	0.002 (0.017)	-0.006 (0.014)	0.009 (0.013)	-0.016 (0.015)	0.034 (0.016) *
β_5	0.043 (0.014) **	-0.01 (0.016)	-0.024 (0.019)	-0.026 (0.009) **	-0.002 (0.016)	0.06 (0.012) ***
R^2	0.07	0.04	0.04	0.04	0.08	0.07
Surface tests						
α_1	0.059 (0.021) **	0.077 (0.021) ***	-0.128 (0.023) ***	-0.081 (0.026) **	0.078 (0.021) ***	-0.025 (0.019)
α_2	-0.006 (0.022)	0.052 (0.025) *	-0.013 (0.031)	0.015 (0.020)	0.006 (0.025)	0.041 (0.018) *
α_3	-0.094 (0.023) ***	-0.014 (0.026)	-0.027 (0.022)	0.023 (0.024)	0.152 (0.022) ***	0.053 (0.023) *
α_4	0.001 (0.025)	0.048 (0.032)	0.000 (0.03)	-0.004 (0.021)	0.038 (0.028)	-0.026 (0.028)

Controls: Flight Distance, Passenger Class Cabin, $N = 733$ (Country pairs). Robust standard errors are reported in parentheses. *p<0.05, **p<0.01,***p<0.001

Figure A1: Three-dimensional representation of the effect of carrier and passenger cultural traits to satisfaction with customer service



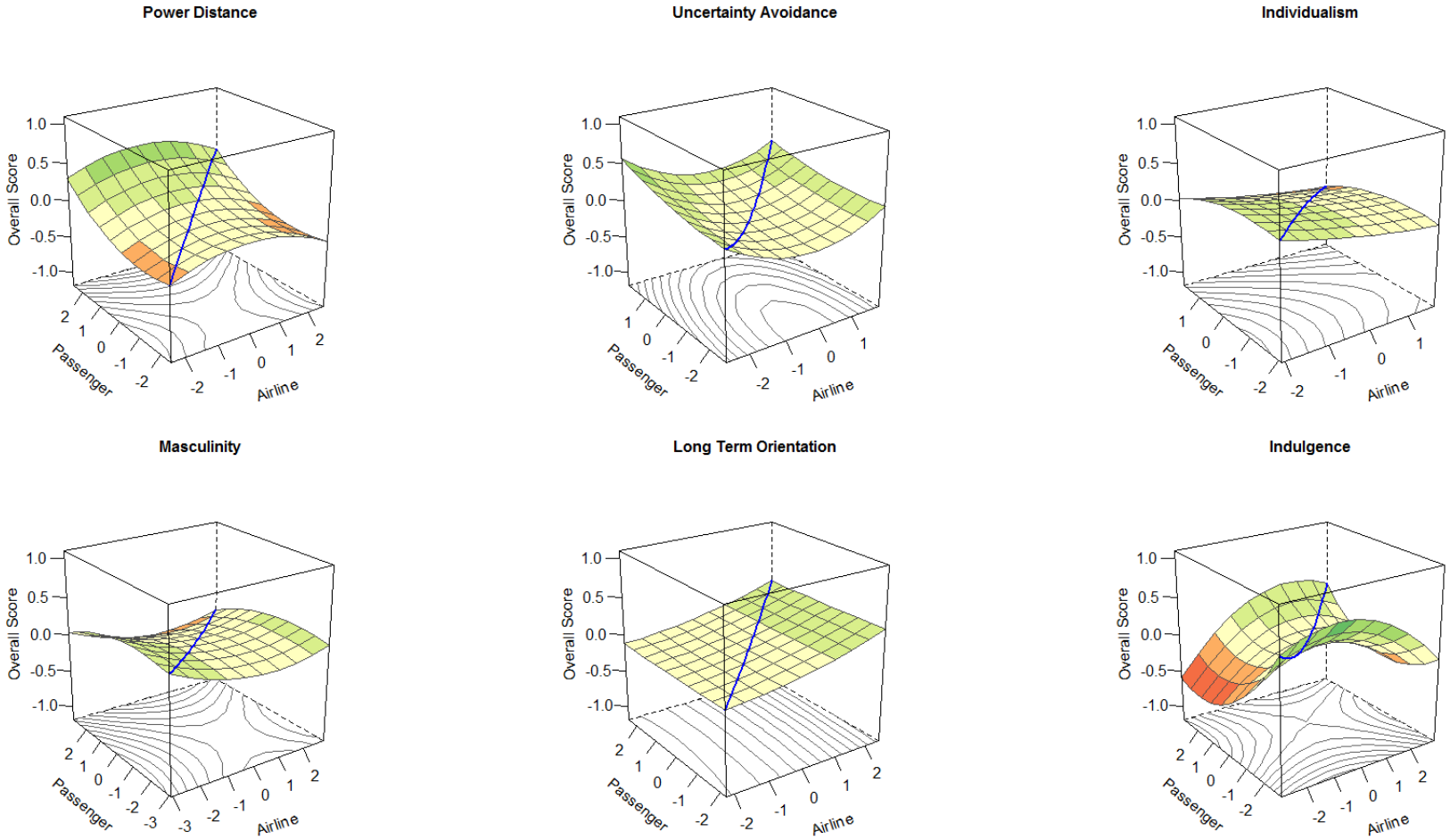
Note: Country pairs = 733, the line depicted is the line of agreement (or congruence). Contour plots are depicted at the bottom.

Table A2: Polynomial Regression and response surface analysis for the overall satisfaction (Two-stage approach)

Variable	Power Distance	Uncertainty Avoidance	Individualism	Masculinity	Long-Term Orientation	Indulgence
β_0	0.019 (0.023)	-0.064 (0.025) *	0.041 (0.031)	0.009 (0.021)	0.002 (0.026)	0.009 (0.024)
β_1	-0.009 (0.014)	0.024 (0.015)	-0.090 (0.014) ***	-0.028 (0.018)	0.084 (0.015) ***	0.021 (0.014)
β_2	0.104 (0.016) ***	0.071 (0.016) ***	-0.081 (0.015) ***	-0.048 (0.015) **	-0.004 (0.016)	-0.071 (0.014) ***
β_3	-0.042 (0.012) ***	0.066 (0.014) ***	0.014 (0.019)	0.025 (0.013)	0.012 (0.014)	-0.054 (0.011) ***
β_4	0.000 (0.014)	-0.007 (0.016)	0.004 (0.013)	0.001 (0.013)	-0.001 (0.015)	0.042 (0.015) **
β_5	0.039 (0.014) **	0.014 (0.015)	-0.039 (0.017) *	-0.018 (0.008) *	0.001 (0.015)	0.056 (0.012) ***
R^2	0.10	0.05	0.08	0.03	0.04	0.01
Surface tests						
α_1	0.095 (0.02) ***	0.095 (0.02) ***	-0.170 (0.021) ***	-0.076 (0.024) **	0.080 (0.021) ***	-0.050 (0.018) **
α_2	-0.003 (0.021)	0.074 (0.022) ***	-0.022 (0.029)	0.008 (0.020)	0.013 (0.024)	0.044 (0.019) *
α_3	-0.112 (0.022) ***	-0.047 (0.025)	-0.009 (0.021)	0.020 (0.023)	0.088 (0.022) ***	0.092 (0.021) ***
α_4	-0.004 (0.024)	0.087 (0.029) **	-0.029 (0.028)	0.006 (0.020)	0.015 (0.027)	-0.040 (0.027)

N = 733 (Country pairs). Robust standard errors are reported in parentheses. *p<0.05, **p<0.01,***p<0.001

Figure A2: Three-dimensional representation of the effect of carrier and passenger cultural traits to overall satisfaction (Two-stage least squares approach)



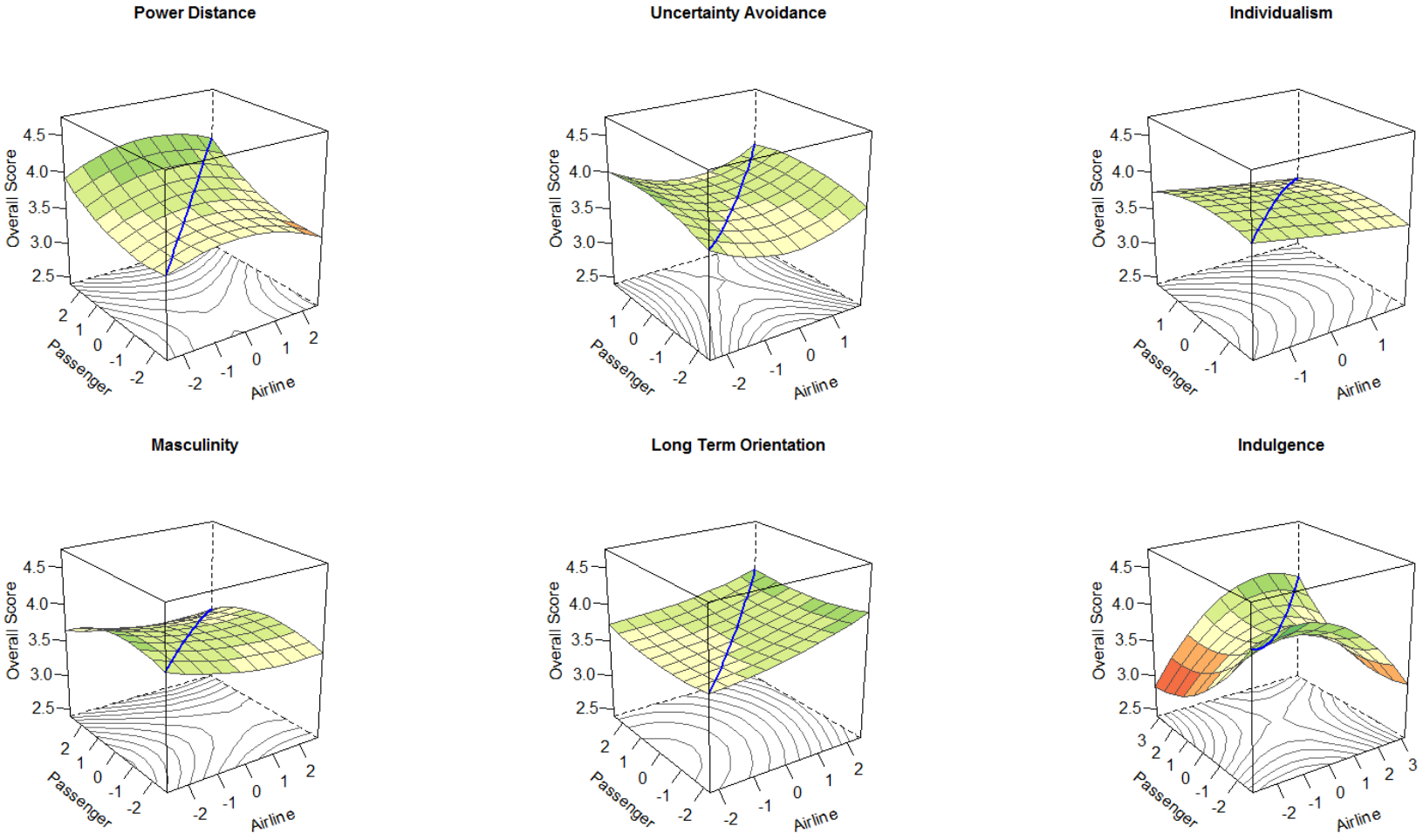
Note: Country pairs = 733, the line depicted in blue is the line of agreement (or congruence). Contour plots are depicted at the bottom

Table A3: Polynomial Regression and response surface analysis with dependent variable the overall satisfaction (Control for Migration)

Variable	Power Distance	Uncertainty Avoidance	Individualism	Masculinity	Long-Term Orientation	Indulgence
β_0	3.745 (0.028) ***	3.699 (0.034) ***	3.777 (0.038) ***	3.753 (0.025) ***	3.709 (0.031) ***	3.753 (0.028) ***
β_1	-0.001 (0.018)	0.026 (0.019)	-0.091 (0.018) ***	-0.05 (0.024) *	0.079 (0.018) ***	0.011 (0.017)
β_2	0.109 (0.019) ***	0.029 (0.024)	-0.032 (0.018)	-0.036 (0.018) *	-0.002 (0.02)	-0.063 (0.019) ***
β_3	-0.039 (0.016) *	0.066 (0.018) ***	0.004 (0.023)	0.015 (0.018)	0.014 (0.018)	-0.061 (0.014) ***
β_4	0.009 (0.017)	-0.002 (0.02)	0.004 (0.017)	0.005 (0.017)	-0.007 (0.019)	0.06 (0.019) **
β_5	0.031 (0.015) *	-0.027 (0.025)	-0.043 (0.02) *	-0.03 (0.011) **	0.016 (0.018)	0.036 (0.013) **
R^2	0.10	0.04	0.07	0.04	0.04	0.08
Surface tests						
α_1	3.745 (0.028) ***	3.699 (0.034) ***	3.777 (0.038) ***	3.753 (0.025) ***	3.709 (0.031) ***	3.753 (0.028) ***
α_2	-0.001 (0.018)	0.026 (0.019)	-0.091 (0.018) ***	-0.05 (0.024) *	0.079 (0.018) ***	0.011 (0.017)
α_3	0.109 (0.019) ***	0.029 (0.024)	-0.032 (0.018)	-0.036 (0.018) *	-0.002 (0.02)	-0.063 (0.019) ***
α_4	-0.039 (0.016) *	0.066 (0.018) ***	0.004 (0.023)	0.015 (0.018)	0.014 (0.018)	-0.061 (0.014) ***

Controls: Flight Distance, Passenger Class Cabin, $N = 471$ (Country pairs). Robust standard errors are reported in parentheses. *p<0.05, **p<0.01, ***p<0.001

Figure A3: Three-dimensional representation of the effect of carrier and passenger cultural traits to overall satisfaction (Control for Migration)



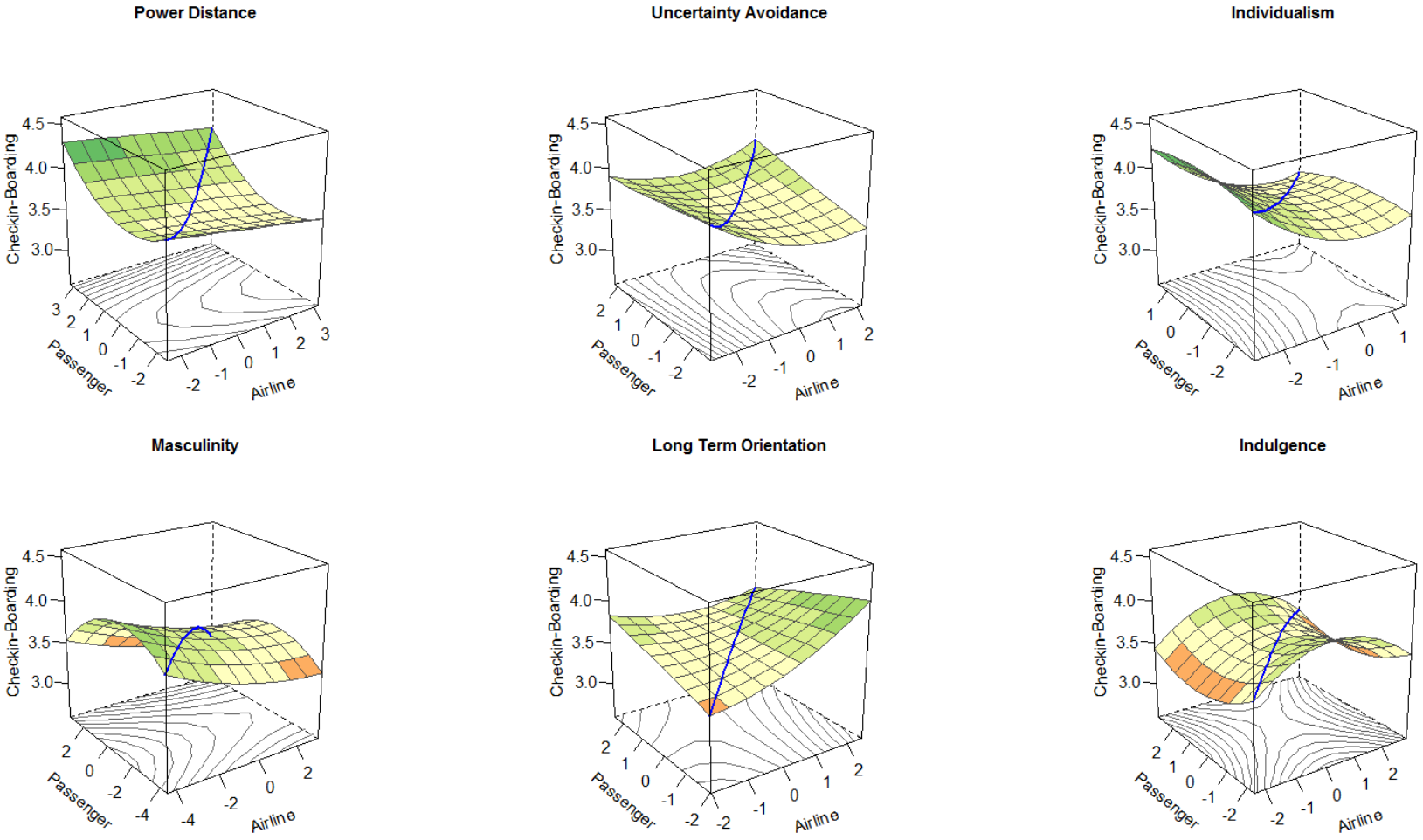
Note: Country pairs = 471, the line depicted in blue is the line of agreement (or congruence). Contour plots are depicted at the bottom

Table A4: Polynomial Regression and response surface analysis with dependent variable the satisfaction score with ground service where departure airport is from the same country with the airline.

Variable	Power Distance	Uncertainty Avoidance	Individualism	Masculinity	Long-Term Orientation	Indulgence
β_0	3.619 (0.046) ***	3.619 (0.048) ***	3.619 (0.059) ***	3.68 (0.04) ***	3.635 (0.054) ***	3.685 (0.048) ***
β_1	-0.042 (0.027)	-0.02 (0.029)	-0.061 (0.028) *	-0.05 (0.042)	0.073 (0.029) *	0.037 (0.028)
β_2	0.052 (0.033)	0.041 (0.031)	-0.049 (0.039)	-0.072 (0.028) **	0.008 (0.03)	-0.043 (0.032)
β_3	-0.001 (0.023)	0.034 (0.025)	0.067 (0.04)	0.008 (0.032)	0.03 (0.028)	-0.06 (0.023) **
β_4	0.002 (0.024)	0.024 (0.035)	-0.01 (0.024)	0.001 (0.033)	-0.041 (0.031)	0.002 (0.028)
β_5	0.042 (0.019) *	0.003 (0.03)	-0.026 (0.03)	-0.028 (0.012) *	-0.002 (0.035)	0.035 (0.026)
R^2	0.07	0.03	0.05	0.06	0.05	0.07
Surface tests						
α_1	0.01 (0.04)	0.02 (0.034)	-0.11 (0.052) *	-0.121 (0.049) *	0.081 (0.038) *	-0.007 (0.043)
α_2	0.044 (0.032)	0.061 (0.039)	0.032 (0.053)	-0.019 (0.043)	-0.012 (0.052)	-0.023 (0.033)
α_3	-0.093 (0.045) *	-0.061 (0.049)	-0.013 (0.043)	0.022 (0.051)	0.065 (0.045)	0.08 (0.043)
α_4	0.039 (0.043)	0.013 (0.066)	0.051 (0.053)	-0.021 (0.05)	0.069 (0.059)	-0.027 (0.056)

Controls: Flight Distance, Passenger Class Cabin, $N = 196$ (Country pairs). Robust standard errors are reported in parentheses. *$p<0.05$, **$p<0.01$, ***$p<0.001$

Figure A4: Three-dimensional representation of the effect of carrier and passenger cultural traits to satisfaction with ground service where departure airport is from the same country with the airline.



Note: Country pairs = 196, the line depicted in blue is the line of agreement (or congruence). Contour plots are depicted at the bottom.

Table A5: List of top 40 countries and airlines with the highest number of reviews in each country.

Country	Airline	Number of reviews
ARGENTINA	Aerolineas Argentinas	5,280
AUSTRALIA	Qantas	5,338
AUSTRIA	Austrian Airlines	2,127
BRAZIL	GOL Airlines	8,413
CANADA	Air Canada	6,872
CHILE	LATAM Airlines	14,814
CHINA	Air China	1,831
COLOMBIA	Avianca	6,734
FRANCE	Air France	9,966
GERMANY	Lufthansa	10,786
GREECE	Aegean Airlines	3,466
HONG KONG	Cathay Pacific	5,052
HUNGARY	Wizz Air	3,681
ICELAND	WOW air	3,822
INDIA	Jet Airways	4,395
INDONESIA	Garuda Indonesia	3,114
IRELAND	Ryanair	21,149
ITALY	Alitalia	6,700
JAPAN	ANA (All Nippon Airways)	3,436
MALAYSIA	Malaysia Airlines	2,407
MEXICO	Aeromexico	3,392
NETHERLANDS	Transavia	20,361
NEW ZEALAND	Air New Zealand	3,881
NORWAY	Norwegian	6,126
PHILIPPINES	Cebu Pacific Air	1,350
PORTUGAL	TAP Portugal	5,059
RUSSIA	Aeroflot	5,450
SINGAPORE	Singapore Airlines	6,785
SOUTH AFRICA	South African Airways	1,672
SOUTH KOREA	Korean Air	1,691
SPAIN	Vueling Airlines	7,538
SWEDEN	SAS	2,980
SWITZERLAND	Swiss International Air Lines	4,311
TAIWAN	EVA Air	1,736
THAILAND	Thai Airways	4,679
TURKEY	Turkish Airlines	8,640
UNITED ARAB EMIRATES	Emirates	18,302
UNITED KINGDOM	British Airways	15,672
UNITED STATES	American Airlines	18,912
VIETNAM	Vietnam Airlines	2,103