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Assessing Airbnb as a disruptive innovation relative to hotels: Substitution and comparative performance expectations

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ABSTRACT

Millions of tourists have used Airbnb accommodations, and Airbnb is frequently discussed in terms of its current or future impacts on hotels. The purpose of this research was to investigate such impacts by determining the extent to which Airbnb is used as a hotel substitute and to examine how Airbnb guests expect their accommodations to perform relative to hotels. Together, these analyses were intended to provide empirical insight into Airbnb's status as a disruptive innovation. The study involved an online survey of over 800 tourists who had used Airbnb within the previous year. Nearly two-thirds had used Airbnb as a hotel substitute. When considering traditional hotel attributes (e.g., cleanliness and comfort), Airbnb was generally expected to outperform budget hotels/motels, underperform upscale hotels, and have mixed outcomes versus mid-range hotels, signalling some – but not complete – consistency with the concept of disruptive innovation. Numerous practical and theoretical implications are discussed.

1. Introduction

Airbnb, a service that allows ordinary people to rent residences to tourists, has quickly become one of the most talked-about topics in the hospitality sector. The service has enjoyed extremely rapid growth since its inception in 2008, with over 100 million guests having stayed in Airbnb accommodations by the summer of 2016 (Chafkin and Newcomer, 2016), and a growing global inventory of over two million listings (Airbnb, 2016a). However, while it is generally accepted that Airbnb has shaken up the tourism accommodation landscape, much debate remains regarding the degree to which Airbnb siphons guests away from existing accommodations, and how the quality of Airbnb accommodations compares to hotel offerings.

Airbnb describes itself as "a trusted community marketplace for people to list, discover, and book unique accommodations around the world" (Airbnb, 2016a). Its accommodations typically involve an entire home (e.g., an apartment or house), or a private room in a residence where the host is also present, and Airbnb's diverse inventory ranges from very modest to extremely luxurious. The Airbnb website (www.airbnb.com) is quite straightforward: a prospective guest searches based on destination, travel dates, and party size; the website then returns a list of available spaces that can be refined by attributes like price, neighbourhood, and amenities; and then individual listings can be selected for greater detail, which includes a description, photographs, and reviews from previous guests. When interested in a listing, the tourist generally sends the host a reservation request and/or message to express interest, possibly to ask questions, and often to provide information about the travel party. The host then may respond and ask any questions of the tourist, or if a reservation request has been made then the host can accept or reject the request. Payments are made through the Airbnb website, with the company charging both guests and hosts a small fee.

Airbnb has continually introduced noteworthy service improvements. For example, to enhance security, Airbnb has introduced numerous identity verification mechanisms, including providing an official form of photo identification and linking one's Airbnb profile with one's Facebook and LinkedIn accounts. In 2011, Airbnb began offering hosts access to free professional photographers whose pictures are verified with an Airbnb watermark (Boyd Myers, 2011), and introduced a 24-hour hotline (Kincaid, 2011). In 2013, Airbnb hired the founder of a major boutique hotel company as its Head of Global Hospitality & Strategy, responsible for promoting key standards in areas such as cleanliness, hosts' response time, and the accuracy of listing descriptions (Geron, 2013). More recently, Airbnb offered free smoke alarms and carbon monoxide detectors to thousands of hosts (Tam, 2014); launched an "Instant booking"

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feature permitting reservations at some rentals to be made immediately, without explicit host approval (Plautz, 2014); introduced a "Superhost" status badge for especially active and well-reviewed hosts (Airbnb, 2016b); and modified the reviewing procedures to encourage more honest (i.e., less positive) reviews (Rubin, 2014). Also, lately Airbnb has made efforts to attract more business travellers (currently a small segment of Airbnb's guests) by setting up a dedicated business travel portal with customized search results and expenditure management tools, by partnering with various corporate travel management firms, and by introducing a "Business Travel Ready" badge that can be earned by listings with characteristics like a designated workspace (Dillet, 2015; Terdiman, 2014).

As Airbnb has expanded, it has triggered significant debate within the hotel industry regarding the threat that Airbnb poses. While some hoteliers and industry analysts perceive Airbnb as a threat, many others question Airbnb's impacts. The skeptics generally argue that Airbnb is inconsequentially small, it provides a distinct and generally lower quality product serving a different market, and it is unappealing to the lucrative business travel market. This attitude is illustrated by a recent comment from Hilton Worldwide's CEO:

> We do not believe there is a material impact on the bulk of our markets or with our core business and leisure customers. . . . I think it's extremely hard for [Airbnb] to replicate what we are doing. And I don't think [our core] customers suddenly woke up . . . and said we really don't care about consistently high quality products and we don't need service and we don't need amenities. (DePillis, 2016)

The purpose of this study was to examine Airbnb's potential to impact hotels. The study firstly involved assessing the degree to which Airbnb is presently used as a substitute for hotels. This substitution question has obvious implications for hotels, but also for destinations more generally. Whereas most analyses of Airbnb substitution have taken a supply-side perspective (e.g., Zervas et al., 2015), this study provides a useful demand-side view. This study secondly compared Airbnb guests' performance expectations for the service with that of hotels in order to better understand both Airbnb's strengths and weaknesses. This analysis complements motivation research on Airbnb choice that has mostly focused on the company's strengths (e.g, Tussyadiah, 2015). Together, these two analyses provide empirical insight into Airbnb's status as a "disruptive innovation," which is a status claimed by Guttentag (2015) and frequently stated in the media, but which has not been tested. Although Airbnb represents part of a broader peer-to-peer tourism accommodation sector, with competitors such as HomeAway and Wimdu, there is noteworthy diversity within the sector (e.g., HomeAway only lists entire homes). To avoid any complications stemming from such differences, this study focused solely on Airbnb, the largest and most prominent company in the sector.

2. Literature review

2.1. Airbnb's impacts on hotels

Existing research has considered the impacts of myriad internal and external factors on hotel performance, such as a hotel's economic environment, geographic location, competitive strategy, and market orientation (Sainaghi, 2010). The emergence of Airbnb represents a novel and unique development with the potential to impact hotels. Research investigating Airbnb's impacts on hotels primarily has taken a supply-side perspective. Most notably, Zervas et al. (2015) examined the relation between changes in Airbnb listing volume and hotel revenues in Texas. They concluded that a 10% increase in Airbnb listings corresponded with a 0.37% decrease in hotel room revenue, a function of both occupancy and, to an even greater degree, rate decreases. The authors also found that the impacts were greater at lower-end hotels, independent hotels, and hotels that did not cater to business travellers. In an unpublished Master's thesis, Neeser (2015) replicated Zervas et al.'s (2015) approach in Scandinavia. He found that Airbnb negatively impacted hotels' average daily rates, but did not impact revenue per available room, suggesting hotels were reducing rates in order to maintain occupancy levels.

Several industry groups also have examined Airbnb's impacts on hotels. Lane and Woodworth (2016), working for the commercial real estate company CBRE, examined U.S. Airbnb and hotel data, and found that Airbnb demand represented (a growing) 1.4% of hotel demand, and that Airbnb's footprint was larger in major urban markets. The authors concluded Airbnb would impact hotels primarily by limiting price premiums during peak periods and by stifling inventory growth. In contrast, the hotel performance tracking firm STR compared Manhattan hotel data and Airbnb data, and found no clear evidence that Airbnb was cannibalizing hotel customers or undermining hotel pricing power even on very high occupancy nights (Haywood, 2016; Haywood et al., 2016). The tourism research firm HVS (2015), commissioned by the Hotel Association of New York City, estimated that in the 12 months ending August 2015 Airbnb resulted in a direct loss of $451 million for New York City hotels, although this figure questionably presumed every dollar spent on Airbnb accommodation would have otherwise been spent in a hotel (Mayock, 2015). Finally, Swig (2014), a hospitality consultant, looked at San Francisco hotel occupancy rates from early 2014 and found weekday rates to be up and weekend rates to be down, which he suggested was due to Airbnb and other similar companies because weekend occupancies are driven more by leisure travellers, who are more likely to use Airbnb.

Nowak et al. (2015), working for the financial services company Morgan Stanley, conducted the only apparent (non-Airbnb) research on Airbnb's substitution that has taken a demand-side view. Nowak et al. asked Airbnb users to indicate any number of accommodation alternatives Airbnb had replaced, and the top four responses were hotel (42%), bed-and-breakfast (36%), friends/family (31%), and extended stay hotel (30%), with 4% claiming they would not have otherwise taken the trip. Even though "hotel" was the most common response, the authors concluded Airbnb would have only a limited impact on hotels due to its focus on longer-duration leisure travellers instead of the short-stay business travellers integral to many hotels.

Finally, Airbnb has produced about two dozen destination-specific economic impact reports, which frequently have stated that around 30% of Airbnb guests would not have otherwise visited a destination or stayed as long without Airbnb. However, combining these two statements into a single category makes it impossible to know the first percentage (of guests who would not have otherwise visited a destination). This figure importantly would help signal the degree to which Airbnb is used as a substitute for existing accommodations.

2.2. Hotel choice and Airbnb choice

There exists a fairly substantial literature exploring the reasons why tourists choose one hotel over another. This research has generally involved respondents rating the importance of different hotel attributes (e.g., Chan and Wong, 2006), and it sometimes focuses on particular types of tourists, such as business travellers (e.g., Lockyer, 2002). Various studies have demonstrated that hotel preferences are influenced by traveller characteristics, including nationality (McCleary et al., 1998) and gender (Cobanoglu et al., 2003). Overall, this research has revealed a variety of primary attributes – cleanliness, location, reputation, price, value, service quality (e.g., staff

friendliness and helpfulness), room comfort, and security. It also has identified various secondary attributes that are noteworthy but tend to be perceived as less important, including restaurant quality, fitness amenities, parking facilities, loyalty programs, and the check-in and check-out procedures (e.g., Chu and Choi, 2000; Dolnicar and Otter, 2003; Sohrabi et al., 2012). Moreover, recent research has stressed the importance of online reviews on hotel decisions (e.g., Gretzel and Yoo, 2008).

A much smaller body of literature has begun examining Airbnb guests' motivations for using the service. Guttentag (2015) provided a conceptual overview of Airbnb and proposed three key appeals of the service – price, household amenities, and authenticity. Tussyadiah (2015) surveyed peer-to-peer short-term rental users (the broader accommodation category in which Airbnb resides), and found they were motivated by three factors – sustainability, community, and economic benefits – with economic benefits being the most significant. Finally, Nowak et al. (2015) surveyed U.S. and European Airbnb users and found that the top five reasons they had chosen the service were "cheaper price," "location," "authentic experience," "own kitchen," and "uniqueness of unit."

Whereas the hotel choice literature has focused on the choice between different hotel properties, the Airbnb choice literature has focused on the choice to use Airbnb more generally. These bodies of research also have examined fairly distinct sets of attributes, with the Airbnb literature focusing on Airbnb's unique set of characteristics, rather than those typically featured in hotel studies. While this distinct approach is understandable, the resulting problem is that the Airbnb choice literature focuses almost entirely on Airbnb's purported strengths. It seems equally important to understand how Airbnb compares with hotels along hotels' traditional attributes, as such knowledge will highlight any weaknesses in the Airbnb product and clarify the degree to which Airbnb guests are willing to tolerate such weaknesses in order to enjoy Airbnb's other benefits.

2.3. Disruptive innovation

The notion that has just been described – tolerating weaknesses in order to enjoy other benefits – perfectly encapsulates the concept of disruptive innovation, which Guttentag (2015) recommended as a useful lens through which to view Airbnb. As outlined by Christensen (1997) and Christensen and Raynor (2003), a disruptive innovation's appeal does not come from improved product performance; somewhat counterintuitively, disruptive innovations actually underperform when compared with existing competitors' primary attributes. Nonetheless, disruptive innovations introduce an alternative package of benefits generally centred on being cheaper, simpler, smaller, and/or more convenient. In other words, disruptive innovations are inferior "good enough" products when compared directly to existing competitors, but their unique set of attributes modifies the prevailing value proposition in a way that appeals to some consumers. Disruptive innovations' initial appeal is typically small, and early consumers consist of low-end consumers and/or previous non-consumers of the incumbent competing product. However, the disruptive product improves over time such that it can satisfy the demands of mainstream consumers. In doing so, it encroaches upon the existing market as it is increasingly adopted as a substitute for the incumbent product, which may be superior along some dimensions but offers a "performance oversupply." Because early on a disruptive innovation appeals only to a small market with minimal profits, it initially tends to be dismissed by leading firms that are content to concentrate on their more profitable market segments. Once these leading firms recognize the threat posed by the disruptive product, it may be so entrenched in the new market it has created that these firms struggle to compete.

The term "disruptive innovation" often is erroneously misapplied to any exceptionally novel product that "disrupts" a market in a more colloquial sense. To clarify, "radical" or "discontinuous" innovations are those that exhibit a significant level of "newness," often in terms of revolutionary technological advancements and/or dramatic changes in customer use, whereas disruptive innovations introduce a new value proposition (Christensen, 1997). In other words, the concepts are based on separate criteria. Also, disruptiveness is not an intrinsic, absolute characteristic of an innovation. Rather, disruptiveness must be relative to an incumbent product, meaning an innovation can be disruptive relative to one product and not another (Christensen, 2006).

As Guttentag (2015) suggested, the disruptive innovation concept seemingly applies directly to Airbnb, which appears to underperform in comparison with hotels when considering traditional hotel performance attributes like cleanliness, quality assurance, and the check in/out process. Nonetheless, for some consumers hotels may offer a "performance oversupply" regarding such attributes, meaning despite Airbnb's purported inferiority it can be appealing due to its alternative set of benefits. Indeed, as is typical of disruptive innovations, Airbnb accommodations often are cheaper than hotels (Guttentag, 2015; Haywood et al., 2016; Hockenson, 2013). Moreover, Airbnb accommodations may provide for a more unique and authentic experience, and they may offer useful household benefits (e.g., a kitchen) not typically available in hotels (Guttentag, 2015).

Nevertheless, Airbnb's status as a disruptive innovation has not been empirically examined. There unfortunately are no precise guidelines for what requisite characteristics define a disruptive innovation. Bower and Christensen (1995) initially explained, "Disruptive technologies introduce a very different package of attributes from the one mainstream customers historically value, and they often perform far worse along one or two dimensions that are particularly important to those customers" (p. 45). Also, Christensen has described disruptive innovations as generally being cheaper, simpler, smaller, and/or more convenient than incumbent products (Christensen, 1997; Christensen et al. 2015). These statements, however, are not precise enough for measurement purposes. Indeed, Danneels (2004) criticized Christensen for using example products with just one or two key performance dimensions, even though many products are far more complex.

Several researchers have attempted to overcome the ambiguities in identifying disruptive innovations, often in research predicting the disruptiveness of a product or a market's susceptibility to disruption. As one component of these assessments, they have generally considered whether a product aligns with the classic characteristics of disruptive innovation, relying on their own market research analysis or the opinions of industry members or experts. Rafii and Kampas (2002) proposed a scorecard for firms to assess disruptive threats, which included rating an innovation on its quality, cost, and ease of use. Hüsig et al. (2005) assessed the disruptive potential of wireless local area network technologies, and included a question about whether the potential disruption was "simpler, cheaper, more reliable or more convenient" (p. 30). Sainio and Puumalainen (2007) assessed the disruptive potential of four information and communication technologies, and included several items focused on whether the products introduced new value propositions. Keller and Hüsig (2009) assessed the disruptive potential of Google's web-based office applications with a scorecard including an item related to overall underperformance and another item related to being "cheaper, simpler, more comfortable or more reliable" (p. 1050). This inclusion of comfort and reliability extends beyond the typical descriptive attributes of disruptive innovation (i.e., cheaper, simpler, smaller, and more convenient),

thereby highlighting that disruptive innovations' new value proposition need not be limited to those four benefits.

3. Methods

3.1. Data collection

Tourists who had stayed in Airbnb accommodation during the previous 12 months were recruited to complete an online survey. Data collection began in July 2015 and ended in October 2015. Two Amazon gift cards of US $50 each (or its international equivalent) were offered as incentives and distributed in lottery draws. Respondents needed to have been significantly involved in the decision to use Airbnb, and only one travel party member (from a respondent's most recent Airbnb stay) could complete the survey.

Because Airbnb is fairly new, has been used by only a small percentage of the population, and has not yet been widely researched, the desired respondents exhibited various characteristics of a "hard-to-reach" population (Marpsat and Razafindratsima, 2010). Consequently, a multiple-frame non-random online sampling approach was deemed necessary. The majority of the respondents were recruited via six travel-themed Facebook groups based around major Canadian cities, and consisting of thousands of members each. Additionally, respondents were recruited through Mechanical Turk (MTurk), an online panel that is increasingly being used for social science research. As recommended by Chen (2012) and Kittur et al. (2008), data quality from MTurk was promoted by paying a relatively high compensation (MTurk respondents were paid per completion, rather than entered in the lottery draws), by including two verifiable questions, and by restricting respondents to certain countries. A handful of other sampling approaches also were used to further bolster and diversify the sample. These approaches involved publishing invitation messages on travel-themed Facebook pages, travel-themed Twitter feeds, and an Airbnb-focused page on Reddit.com; sending invitation messages to a small number of Airbnb hosts and asking them to forward the invitation to their recent guests; sending invitation messages to travel bloggers who had recently used Airbnb; and including a referral link at the end of the survey.

Although the sampling approach was non-random, the combination of different sampling frames was meant to reduce the overall study sample bias. Also, both Facebook and MTurk, where most of the respondents were recruited, have been recognized as recommendable sampling frames that produce high-quality data on a level that is generally comparable to or better than many common alternatives (e.g., Buhrmester et al., 2011; Ramo and Prochaska, 2012). Moreover, as compared to the general population, many of the biases characterizing users of websites like Facebook, MTurk, and Reddit should be consistent with biases found among users of an online service like Airbnb.

3.2. Survey design and data analysis

The survey items were mostly Likert scale and multiple choice. The questions focused primarily on a respondent's most recent Airbnb stay in order to minimize confusion and recall issues. A pretest was conducted with several recent Airbnb guests who were members of the principal researcher's social circle.

To gauge Airbnb's impact on hotel nights, one survey item asked the most likely form of accommodation that would have been used if Airbnb and other similar services did not exist. The "other similar services" phrase was included to avoid respondents simply indicating comparable peer-to-peer short-term rental services. This straightforward approach to gauging substitution has been used previously in studies on car-sharing (e.g., Martin et al., 2010). Pearson's chi-square tests (i.e., goodness-of-fit) were used to compare substitution preferences of different groups, and standardized residuals were used to identify significant group differences (Field, 2013). Also, a question was included on how the choice to use Airbnb affected trip duration, which assessed Airbnb's impact on destination visitor nights and offered insight into Airbnb's combination of these two categories in its economic impact reports.

To better understand how Airbnb is perceived as comparing to hotels, the survey assessed performance expectations of Airbnb, along with a hypothetical nearby budget hotel/motel, mid-range hotel, and upscale hotel, along various attributes. The three hotel classes were compared with Airbnb independently because disruption occurs relative to another product (Christensen, 2006), and different hotel classes represent fairly discrete products. This measure was developed uniquely for this study, but the attributes considered (e.g., cleanliness, comfort, and security) were largely drawn from the hotel choice literature (e.g., Chu and Choi, 2000; Dolnicar and Otter, 2003). However, three items were included relating to Airbnb's supposed unique value proposition – two experiential items related to authenticity and uniqueness, and a third item related to price. Some potentially important attributes, including amenities, staff/host friendliness, and staff/host helpfulness were not included because they would be judged differently for Airbnb and hotels (e.g., some consumers may prefer typical Airbnb amenities like washing machines whereas others may prefer typical hotel amenities like pools). All of these assessments were measured with a six-point Likert scale ranging from "Exceptionally poor" to "Exceptionally good" (except for price, which was measured with a scale ranging from "Very low" to "Very high"). These assessments were intended to explore consumers' perceptions of Airbnb, not to represent objective performance measures, as it is such perceptions that ultimately determine consumers' decisions. The comparative performance expectations of Airbnb and the different hotel classes were analyzed with paired-samples *t*-tests.

An assessment of the applicability of the disruptive innovation concept was based on both the substitution analysis and the performance expectations analysis. Firstly, because the process of disruption is inherently one of substitution, Airbnb's use as a substitute for a given hotel class provided an indication of whether the process was occurring. Secondly, because disruptive innovations underperform along traditional attributes but introduce a new value proposition, Airbnb's performance expectations relative to hotels indicated its consistency with the notion of disruptive innovation. This analysis seems to represent the first attempt at assessing a product's status as a disruptive innovation using consumers' behaviour and product attribute performance evaluations, rather than market research analysis and/or input from industry members or experts.

4. Results

4.1. Sample profile

A total of 923 surveys were received. Data screening eliminated numerous surveys due to issues such as incompleteness, carelessness, and incorrect answers to the verifiable MTurk questions. The final sample consisted of 844 respondents. Of these, 72.4% were from the Canadian travel-themed Facebook groups, 16.4% were from MTurk, 10.3% were from other sampling frames (e.g., Reddit and referrals), and 0.9% were of unspecified origin.

With regards to sample demographics, 67.8% of the respondents were female, 81.9% were between the ages of 21 and 40, 92.8% had at least a university or college degree, and 77.8% perceived their household financial status as at least "just above average" in their home country. Owing to the sampling frames from which most

Table 1
Most likely accommodation choice if Airbnb and other similar services did not exist (N = 842).

	%	n
Would not have taken trip	2.3	19
Friends or family	3.4	29
CouchSurfing	0.8	7
Hostel	16.6	140
Bed-and-breakfast	9.9	83
Budget hotel/motel	17.5	147
Mid-range hotel	43.1	363
Upscale hotel	4.3	36
Other	2.1	18

respondents were recruited, 74.3% of the respondents resided in Canada and 23.0% resided in the U.S. For their most recent Airbnb stay, 80.3% had been travelling for leisure, 59.7% were on an international trip, 18.1% perceived themselves as "backpackers," 70.3% were staying in an entire home (rather than sharing a residence with the host), 62.5% were staying for between two and four nights, 75.5% were staying with between one and three other accompanying guests, and 57.6% were staying with a spouse or partner. Finally, 55.8% had used Airbnb no more than three times, 57.7% had first used Airbnb in 2014 or 2015 (data collection occurred between July and October 2015), and 9.9% had experience as Airbnb hosts.

To assess the representativeness of the sample, various sample characteristics were compared with characteristics of Airbnb's guest population that could be gleaned from Airbnb's various economic impact reports, and a report on its guests during the summer of 2015 (Airbnb, 2015). Airbnb stated in its summer 2015 report that 54% of its guests were female (Airbnb, 2015), in comparison with 67.8% of the present study's respondents. In the same report, Airbnb claimed that its average guest age is 35 (Airbnb, 2015), and estimating the mean age of the present study's respondents using the midpoint of each age group (e.g., 35 for "31–40") resulted in a mean age of 33. Airbnb economic impact reports suggest that about 86% of its visitors are travelling for leisure, in comparison with 80.3% for the present study. Airbnb economic impact reports and claims to the media (Lu, 2015) both indicate that guests' average length of stay is 4.5 nights, and the average length of stay for respondents in the present study was 4.54 nights.

4.2. Hotel substitution

As can be observed in Table 1, when asked what type of accommodation respondents would have used if Airbnb and other similar services did not exist, nearly two-thirds (64.8%) indicated they used Airbnb as a substitute for a hotel. Of these, the vast majority indicated they would have stayed in a mid-range hotel, whereas upscale hotels were the least commonly indicated. Only 2.3% indicated they used Airbnb to take a trip they would not have otherwise taken. Also, when asked how the choice to use Airbnb impacted the number of nights the respondents spent in their destination, 72.7% indicated it had no impact, 26.5% indicated that choosing Airbnb led them to spend more nights, and 0.8% indicated that choosing Airbnb led them to spend fewer nights.

Chi-square tests were conducted to compare substitution behaviour amongst different groups, the results of which can be observed in Table 2. Significant differences were found by age group, but were mostly driven by younger respondents being more likely to use Airbnb as a substitute for hostels and older respondents being more likely to use Airbnb as a substitute for bed-and-breakfasts. Significant differences also were found between groups of different financial status, with a clear pattern demonstrating those of less wealth were more inclined to use Airbnb as a substitute for unpaid accommodation and hostels, whereas those with more wealth were more inclined to use Airbnb as a substitute for bed-and-breakfasts, mid-range hotels, and upscale hotels. Somewhat similarly, significant differences were found between those who did and did not perceive themselves as backpackers, with backpackers nearly five times more likely to have used Airbnb as a substitute for a hostel, and also somewhat more likely to have used it as a substitute for a budget hotel/motel.

Significant differences also were found between respondents who had used different types of Airbnb accommodation, with those who had stayed in shared accommodation significantly more likely to have used Airbnb in place of a hostel, and those who had stayed in an entire home much more likely to have used Airbnb in place of a mid-range or upscale hotel. No significant differences were found when looking at respondents with different lengths of stay in their Airbnb accommodations. Nonetheless, significant differences were found between respondents who were and were not travelling with children. Those with children were significantly more likely to have used Airbnb as a mid-range hotel substitute and significantly less likely to have used it as a hostel substitute. Results also were slightly statistically significant when comparing respondents who had used Airbnb different numbers of times. There was no obvious pattern in the results, although it appeared that guests with less experience were somewhat less likely to use Airbnb as a hostel substitute and more likely to use it as a mid-range hotel substitute. Finally, no significant differences were found when comparing respondents based on the year they first used Airbnb.

4.3. Comparative performance expectations of Airbnb and hotels

Tables 3, 4, and 5 present respondents' performance expectations for Airbnb and hypothetical nearby hotels of different classes. T-tests found nearly every comparison between Airbnb and budget hotels/motels to be significant (Table 3), with Airbnb expected to outperform budget hotels/motels for all but one attribute ('ease of checking in/out'), including the supposed strengths of hotels/motels. Significant differences also were found between the performance expectations of Airbnb and mid-range hotels for every attribute (Table 4). Respondents expected Airbnb to significantly outperform mid-range hotels with regards to Airbnb's supposed strengths ('authenticity,' 'uniqueness,' and 'price') and several supposed hotel strengths ('cleanliness,' 'comfort,' and 'confidence that the overall quality would meet expectations'). On the other hand, respondents expected Airbnb to underperform mid-range hotels with regards to 'ease of placing a reservation,' 'ease of checking in/out,' 'ease of resolving unexpected problems,' and 'security.' Finally, when comparing the expected performance of Airbnb with upscale hotels, *t*-tests again found highly significant differences for every attribute measured (Table 5). Respondents expected Airbnb to underperform upscale hotels with regards to all of the supposed hotel strengths, and to outperform upscale hotels with regards to all of the supposed Airbnb strengths.

5. Discussion

This study offers important insight into how Airbnb guests perceive the service relative to hotels, and the extent to which they use it as a hotel substitute. In doing so, the study also empirically assesses the common characterization of Airbnb as a disruptive innovation. Even though this research used a non-probability sample, numerous parallels were found between the study sample and Airbnb's guest population, which gives confidence to the representativeness of the sample, and therefore the generalizability of the findings.

Table 2
Different groups' use of Airbnb as a substitute for different forms of accommodation.

Variable	No paid accomm	Hostel	B&B	Budget hotel/motel	Mid-range hotel	Upscale hotel	df	χ^2	*p*
Age (N = 817)									
≤30	7.4	23.0**	6.7*	18.6	41.8	2.5	10	49.514	<0.001
31–40	5.0	11.7*	12.1	14.6	48.8	7.9**			
≥41	7.0	7.7**	16.9**	21.8	43.0	3.5			
Household financial status relative to home country (N = 761)									
Below avg	10.1	24.4*	6.5	19.6	36.3	3.0	10	23.022	0.011
Just above avg	6.5	17.2	10.4	18.3	44.2	3.4			
Above/Well above avg	5.0	12.2	11.3	16.8	47.9	6.7			
Backpacking (N = 817)									
No	7.0	10.3***	11.2	16.8	49.9*	4.8	5	134.69	<0.001
Yes	5.4	47.0***	4.7*	22.8	17.4***	2.7			
Airbnb accommodation type (N = 815)									
Entire place	6.7	13.2*	8.4	15.8	50.5*	5.4	5	48.684	<0.001
Shared	6.9	26.1***	13.5	22.4	29.4***	1.6*			
Trip duration (N = 812)									
1 night	3.9	17.1	17.1	21.1	39.5	1.3	20	24.560	0.219
2 nights	8.2	16.5	12.1	18.1	42.3	2.7			
3 nights	6.8	19.8	6.8	13.5	49.5	3.6			
4–5 nights	6.4	14.6	9.6	21.5	43.4	4.6			
≥6 nights	7.0	16.8	8.4	16.8	42.7	8.4			
Travelling with children (N = 824)									
No	6.8	18.7	9.9	18.4	42.1	4.1	5	19.592	0.001
Yes	5.6	3.3**	11.1	13.3	60.0*	6.7			
Total times used Airbnb (N = 811)									
1 time	7.9	13.0	7.3	16.9	50.8	4.0	15	25.505	0.044
2–3 times	7.6	14.1	10.1	17.7	46.9	3.6			
4–5 times	7.5	23.9*	8.8	14.5	39.0	6.3			
≥6 times	3.0	19.2	13.1	21.7	38.9	4.0			
Year first used Airbnb (N = 810)									
2008–2012	7.4	12.1	11.1	17.4	47.4	4.7	15	13.018	0.601
2013	7.1	22.1	10.4	13.6	40.3	6.5			
2014	6.3	18.8	9.0	20.3	42.6	3.1			
2015	5.7	16.7	10.0	17.1	46.7	3.8			

Notes: The "No paid accomm" category includes respondents who indicated they would not have otherwise taken the trip, would have stayed with friends or family, or would have used CouchSurfing. The "Below avg" household financial status group includes respondents who indicated "Well below average," "Below average," or "Just below average." Asterisks signify cells that are significantly different from their expected values, as per their standardized residuals.

* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.

5.1. Airbnb as a hotel substitute

This study found that Airbnb is used almost exclusively as a substitute for existing accommodations, and primarily for hotels. Only a tiny percentage of the respondents indicated that Airbnb allowed them to take a trip they would not have otherwise taken, or that they would have otherwise not used paid accommodation. In contrast, nearly two-thirds indicated they used Airbnb as a hotel substitute, with most indicating they used it as a mid-range hotel substitute, another sizeable portion indicating they used it as a budget hotel/motel substitute, and a small percentage indicating they used it as an upscale hotel substitute. These results are fairly consistent with supply-side research conducted by Zervas et al. (2015), who also found Airbnb's impact to be greater on lower-end hotels. The present study's demand-side analysis offers a valuable complement to such research because hotel performance is influenced by many confounding variables that complicate supply-side analyses. Moreover, demand-side analysis is preferable for estimating Airbnb's future impacts as it continues growing. The only other demand-side look at Airbnb substitution comes from Nowak et al. (2015), who similarly found Airbnb guests use the service as a substitute for hotels more than any other accommodation type. Also, the present study appears to be the first to examine substitution by different types of Airbnb guests. It was found that Airbnb guests who were wealthier, non-backpackers, staying in entire homes, or travelling with children were more likely to use Airbnb as a substitute for mid-range and/or upscale hotels.

From a hotel perspective, the substitution question is critically important. Airbnb initially positioned itself as a hotel alternative (Airbnb, 2016c), but nowadays insists that it complements rather than competes with hotels. For example, an Airbnb co-founder and its Chief Technology Officer stated, "No hotels have gone out of business because of Airbnb . . . Airbnb is not a perfect substitute for a hotel. We excel at different things" (Dingman, 2015). This study's findings question such claims, but Airbnb's messaging is understandable. Even though Airbnb's common role as a hotel substitute reflects well on the service and could be touted in advertising, the more hotels fail to perceive Airbnb as a threat, the more complacent they will be in responding. Additionally, Airbnb's position on this topic is presumably related to its widespread regulatory battles, as policymakers will be much more amenable to Airbnb if it is not simply cannibalizing guests from existing accommodations.

To date, the reaction from the hotel sector to Airbnb has been mixed. Some hoteliers have voiced concerns over Airbnb (e.g., Bryan, 2015), and various hotel associations have advocated stricter regulatory oversight and enforcement (O'Neill, 2014). Nevertheless, many hoteliers have expressed skepticism regarding Airbnb's impacts (e.g., DePillis, 2016). For example, Doubletree's Global

Table. 3
Airbnb performance expectations in comparison with budget hotels/motels.

Attribute	Accommodation	M	SD	df	t	*p*	N
Supposed strengths of hotels/motels (1 = "Exceptionally poor", 6 = "Exceptionally good")							
Cleanliness	Airbnb	4.94	0.84	830	35.00	<0.001	831
	Budget hotel/motel	3.36	1.06				
Comfort	Airbnb	4.81	0.88	821	35.34	<0.001	822
	Budget hotel/motel	3.17	1.05				
Confidence quality would meet expectations	Airbnb	4.61	1.02	822	26.41	<0.001	823
	Budget hotel/motel	3.15	1.29				
Ease of placing reservation	Airbnb	4.93	1.08	822	3.44	0.001	823
	Budget hotel/motel	4.75	1.20				
Ease of checking in/out	Airbnb	4.68	1.21	823	0.40	0.690	824
	Budget hotel/motel	4.70	1.17				
Ease of resolving unexpected problems	Airbnb	4.02	1.31	814	6.71	<0.001	815
	Budget hotel/motel	3.61	1.33				
Security	Airbnb	4.27	1.15	818	17.37	<0.001	819
	Budget hotel/motel	3.31	1.30				
Supposed strengths of Airbnb (1 = "Exceptionally poor", 6 = "Exceptionally good")							
Local authenticity of the experience	Airbnb	5.49	0.77	815	55.03	<0.001	816
	Budget hotel/motel	2.68	1.19				
Uniqueness (non-standardization) of the experience	Airbnb	5.47	0.81	820	63.13	<0.001	821
	Budget hotel/motel	2.21	1.19				
Price (1 = "Very low", 6 = "Very high")	Airbnb	2.78	0.90	820	11.23	<0.001	821
	Budget hotel/motel	3.31	0.99				

Notes: Respondents were asked to rate the performance they expected when booking their most recent Airbnb stay, plus the performance they would have expected in hypothetical nearby hotels of different classes. Price was measured by asking respondents to characterize the price of their Airbnb rental and hypothetical nearby hotels of different classes, relative to all tourism accommodations in the destination.

Table 4
Airbnb performance expectations in comparison with mid-range hotels.

Attribute	Accommodation	M	SD	df	t	*p*	N
Supposed strengths of hotels (1 = "Exceptionally poor", 6 = "Exceptionally good")							
Cleanliness	Airbnb	4.94	0.84	831	8.21	<0.001	832
	Mid-range hotel	4.61	0.88				
Comfort	Airbnb	4.81	0.89	825	10.54	<0.001	826
	Mid-range hotel	4.32	0.98				
Confidence quality would meet expectations	Airbnb	4.60	1.02	822	8.80	<0.001	823
	Mid-range hotel	4.15	1.12				
Ease of placing reservation	Airbnb	4.93	1.08	824	2.97	<0.001	825
	Mid-range hotel	5.07	0.99				
Ease of checking in/out	Airbnb	4.68	1.21	827	6.87	<0.001	828
	Mid-range hotel	5.06	1.00				
Ease of resolving unexpected problems	Airbnb	4.01	1.32	814	10.22	<0.001	815
	Mid-range hotel	4.60	1.08				
Security	Airbnb	4.27	1.15	819	3.91	<0.001	820
	Mid-range hotel	4.48	1.10				
Supposed strengths of Airbnb (1 = "Exceptionally poor", 6 = "Exceptionally good")							
Local authenticity of the experience	Airbnb	5.48	0.78	824	46.02	<0.001	825
	Mid-range hotel	3.06	1.22				
Uniqueness (non-standardization) of the experience	Airbnb	5.47	0.80	824	52.03	<0.001	825
	Mid-range hotel	2.62	1.29				
Price (1 = "Very low", 6 = "Very high")	Airbnb	2.78	0.91	828	29.30	<0.001	829
	Mid-range hotel	4.21	1.07				

Notes: Respondents were asked to rate the performance they expected when booking their most recent Airbnb stay, plus the performance they would have expected in hypothetical nearby hotels of different classes. Price was measured by asking respondents to characterize the price of their Airbnb rental and hypothetical nearby hotels of different classes, relative to all tourism accommodations in the destination.

Head stated, "We haven't seen any effect of [Airbnb] on our business. The research we've done shows it as a different kind of traveller typically for a different trip purpose" (Vivion, 2014). This attitude, at least within the upscale market, is understandable given Airbnb's current limited impact on upscale hotels and its struggle to attract many business travellers. Nonetheless, consistent with the process of disruptive innovation, this attitude highlights how incumbent firms overlook an encroaching threat from below by focusing on their immediate ability to retain their highest value customers (Christensen, 1997). Although there are limits to the degree hotels will be overtaken by Airbnb, the process of disruptive innovation suggests upscale hoteliers should not be content that Airbnb's impacts have so far been mostly limited to budget and mid-range hotels, but should rather view these impacts as a possible harbinger for the future.

From a destination perspective, Airbnb's role as a substitute for existing accommodations means it may reduce visitors' overall expenditure in a destination (assuming they are saving money by using Airbnb). Moreover, Airbnb may have other negative consequences in a community, such as reducing housing stock and hurting the community fabric (Guttentag, 2015). Nevertheless, Airbnb guests may spend their economic savings from using Airbnb elsewhere in a destination, plus Airbnb may provide a destination with additional benefits, such as reducing economic leakages,

Table 5
Airbnb performance expectations in comparison with upscale hotels.

Attribute	Accommodation	M	SD	df	t	*p*	N
Supposed strengths of hotels (1 = "Exceptionally poor", 6 = "Exceptionally good")							
Cleanliness	Airbnb	4.94	0.84	828	22.85	<0.001	829
	Upscale hotel	5.76	0.62				
Comfort	Airbnb	4.81	0.89	822	18.70	<0.001	823
	Upscale hotel	5.60	0.77				
Confidence quality would meet expectations	Airbnb	4.60	1.03	820	14.44	<0.001	821
	Upscale hotel	5.28	0.93				
Ease of placing reservation	Airbnb	4.92	1.08	818	9.46	<0.001	819
	Upscale hotel	5.37	0.94				
Ease of checking in/out	Airbnb	4.68	1.21	823	13.01	<0.001	824
	Upscale hotel	5.39	0.93				
Ease of resolving unexpected problems	Airbnb	4.00	1.31	806	27.72	<0.001	807
	Upscale hotel	5.53	0.81				
Security	Airbnb	4.27	1.16	817	25.30	<0.001	818
	Upscale hotel	5.48	0.78				
Supposed strengths of Airbnb (1 = "Exceptionally poor", 6 = "Exceptionally good")							
Local authenticity of the experience	Airbnb	5.48	0.78	816	34.39	<0.001	817
	Upscale hotel	3.39	1.45				
Uniqueness (non-standardization) of the experience	Airbnb	5.47	0.81	818	30.73	<0.001	819
	Upscale hotel	3.55	1.54				
Price (1 = "Very low", 6 = "Very high")	Airbnb	2.78	0.91	830	40.62	<0.001	831
	Upscale hotel	5.21	1.47				

Notes: Respondents were asked to rate the performance they expected when booking their most recent Airbnb stay, plus the performance they would have expected in hypothetical nearby hotels of different classes. Price was measured by asking respondents to characterize the price of their Airbnb rental and hypothetical nearby hotels of different classes, relative to all tourism accommodations in the destination.

dispersing expenditure throughout residential areas, and engaging residents in the tourism sector. Indeed, this study found that a significant percentage of Airbnb guests increase their trip length because of Airbnb, which is consistent with research on peer-to-peer short-term rentals by Tussyadiah and Pesonen (2015). This noteworthy impact demonstrates Airbnb's ability to benefit local tourism economies and many of their myriad stakeholders (attractions, restaurants, transportation providers, etc.). However, the sizeable percentage of respondents who increased their length of stay due to Airbnb, combined with the much smaller percentage who indicated Airbnb allowed them to take a trip they would not have otherwise taken, raises questions regarding Airbnb's combination of these two groups in its economic impact reports. These findings suggest Airbnb may be combining these groups to obfuscate its data and avoid acknowledging the service's incapacity to stimulate significant additional visitation.

5.2. Performance expectations of Airbnb and hotels

This study examined Airbnb's performance expectations relative to hotels, thereby demonstrating how Airbnb is viewed within the broader tourism accommodation landscape, and highlighting some of Airbnb's potential weaknesses, instead of merely the strengths that have been the focus of Airbnb motivation research. When considering key hotel attributes (e.g., cleanliness and security), it was found that Airbnb significantly outperformed budget hotels/motels, significantly underperformed upscale hotels, and was expected to have mixed outcomes versus mid-range hotels. When considering attributes central to Airbnb's unique value proposition (experiential attributes and low price), Airbnb was expected to significantly outperform all three hotel classes.

These findings reflect very positively on the perceived quality of Airbnb accommodations. Outperforming budget hotels/motels virtually across the board, and outperforming mid-range hotels for many key attributes, is a noteworthy accomplishment for (generally inexpensive) accommodations managed by ordinary people. Nonetheless, the results also highlight some areas where Airbnb could improve. Airbnb's perceived security was only moderately high, which is noteworthy because trust and safety concerns are key barriers to Airbnb adoption (Tussyadiah, 2015). Additionally, the respondents were not especially confident in Airbnb's ability to resolve unexpected problems, which is important because tourists do not want their trips spoiled by accommodation problems. This issue speaks to the delicate balance Airbnb is looking to strike between being a simple matchmaking service and being directly involved in ensuring quality stays. The ease of placing a reservation is a third area where Airbnb could improve, which is noteworthy because Tussyadiah (2015) found "lack of efficacy" to be a key barrier to Airbnb use. The recently introduced "Instant booking" option helps mitigate this issue, but only a limited portion of hosts use this feature. Airbnb likely would benefit from advertising that demonstrates the simplicity of using Airbnb for the first time. Finally, the ease of checking in/out was the one attribute for which Airbnb failed to outperform any of the hotel classes. Airbnb could mitigate this issue by partnering with prevalent businesses like Starbucks and Subway, who could house key boxes that guests could visit with a security code provided by the host.

Looking forward, it seems that Airbnb and hotels will attempt to mimic the other's strengths, leading to increased convergence between them. Airbnb certainly wishes to maintain the authentic, personal touch characterizing its accommodations and brand, but the company also seemingly wishes to provide a more reliable, professionalized guest experience. This desire is signalled by developments like the hiring of a Head of Global Hospitality & Strategy and the introduction of "Instant booking" and "Superhosts." On the hotel side, numerous hotel companies are looking to provide more authentic local character (e.g., Oates, 2016b), and several hotel companies also are launching brands featuring inexpensive rooms and inviting public areas for interaction (e.g., Oates, 2016a). The potential for such developments is that they perform better than traditional properties with regards to characteristics of Airbnb's value proposition, while also outperforming Airbnb along traditional hotel attributes like security.

5.3. Airbnb versus hotels: a disruptive innovation?

Disruptive innovations are adopted by mainstream consumers as substitutes for existing products and are partly defined by their

underperformance along existing products' key attributes, combined with their unique value proposition. This study's findings suggest Airbnb is not truly a disruptive innovation relative to budget hotels/motels, even though it is commonly used as a budget hotel/motel substitute, because Airbnb users perceive it as a superior product, even when considering budget hotels/motels' key performance attributes. On the other hand, respondents' expectations that Airbnb would underperform upscale hotels with regards to traditional hotel attributes, and outperform upscale hotels with regards to Airbnb's unique value proposition, perfectly represents the quintessential performance characteristics of a disruptive innovation. Airbnb's role as a substitute for upscale hotels, however, appears fairly limited, which suggests Airbnb is best considered as a disruptive threat to upscale hotels, rather than a current disruptor.

Airbnb was most commonly used as a substitute for mid-range hotels, but its varied performance expectations in comparison with mid-range hotels suggest some parallels with the disruptive innovation framework, without being fully consistent with the concept. There is no known precedent for determining the number or percentage of key attributes for which a disruptive innovation should underperform. Bower and Christensen (1995) claimed disruptive innovations "often perform far worse along one or two dimensions that are particularly important" (p. 45), and in this case Airbnb was expected to perform significantly worse than mid-range hotels along several important dimensions, including security. Nevertheless, cleanliness, comfort, and quality assurance are all especially important hotel attributes (Chu and Choi, 2000; Dolnicar and Otter, 2003), so Airbnb's expected ability to outperform mid-range hotels along these attributes signifies it does not perfectly represent a disruptive innovation relative to mid-range hotels.

This analysis highlights some key questions and issues regarding the nature of disruptive innovations. The findings underscore the notion that innovations are not intrinsically disruptive, but only relative to another product (Christensen, 2006). Additionally, the findings highlight the common misapplication of the concept to over-performing products. In fact, Govindarajan and Kopalle (2006) advocated recognizing "high-end" disruptions, but Christensen (2006) justifiably opposed this suggestion by stating incumbents' failure to respond to high-end innovations does not result from the same organizational factors. The findings also demonstrate the value in using consumer attitudes in disruptive innovation research. Whereas prior assessments of disruptiveness have been based on market research analysis and/or input from industry members or experts, the consumer perspective is invaluable because it truly signals whether a product is viewed as underperforming. This study's findings likely would have been different if hotel guests were surveyed, and the perceptions of non-users are certainly meaningful, but it is the perceptions of users that provide the optimal assessment of perceived underperformance. Finally, this analysis demonstrates the challenge of establishing a binary disruptiveness test when products have myriad subjective attributes. There is no straightforward way to determine what attributes ought to be inferior, meaning the onus is on the researcher to make a judgement call, and it seems worthwhile to note gradations of consistency with the concept, rather than subscribing to a dichotomous classification.

6. Conclusion

Airbnb represents an innovative accommodation product that has shifted perceptions of hospitality throughout the hotel industry. While Airbnb remains a topic of significant attention within the sector, there is little understanding of the degree to which it is used as a hotel substitute, or how Airbnb guests view the service relative to hotels. This study offers important insight into these questions by showing that many Airbnb guests use the service in place of a hotel, and especially mid-range hotels. Moreover, the study demonstrates that Airbnb guests tend to have fairly high expectations of the service, even when considering traditional hotel attributes. This study also shows that the concept of disruptive innovation is only somewhat applicable to discussions of Airbnb's competition with hotels.

There are various limitations to this research. The use of an online non-probability sample means sample biases could have impacted the results, owing to biases associated with the sampling frames that were used and the resultant Airbnb users who responded to the survey. Even though various parallels were detected between the overall sample and Airbnb's guest population, thereby giving confidence to the generalizeability of the findings, there are still inherent limitations with a non-random sample. Also, nearly all of the respondents were North American. Additionally, respondents' performance expectations for Airbnb may have been influenced by their actual Airbnb experiences. Moreover, it should be noted that this analysis only examined two components of disruptive innovation – whether substitution was occurring and whether the innovation itself exhibited characteristics of a disruptive innovation – but did not assess the disruptive process comprehensively (e.g., the response from existing firms).

This research highlights various possible directions for future research. It would be beneficial to achieve a more complete understanding of the Airbnb choice process to better show why it is used as a substitute for hotels. For example, it is unclear if Airbnb guests tend to seriously investigate and consider hotel options before choosing Airbnb. Longitudinal research tracking Airbnb guests' substitution patterns over time also would prove quite useful, as it would indicate whether Airbnb is increasingly being used as a substitute for certain types of accommodation. Furthermore, it would be interesting to compare Airbnb guests' hotel performance expectations with that of hotel guests. It also would be useful to assess the Airbnb performance expectations of tourists who considered Airbnb but ultimately chose a different accommodation. Finally, this study introduced a new consumer-based strategy for helping to classify innovations as disruptive. This general approach can be applied to other apparent disruptive innovations in tourism and beyond.

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