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Implications of the ageing society and internationalisation for airport services: A perspective on passenger demand for personal space at airport terminals

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ABSTRACT

"Per-passenger-space" has been used as one of the fundamental units of Level of Service (LOS) measurement to evaluate the capacity of airport terminals for passenger comfort and service satisfaction. This study addresses the questions of how air passengers perceive personal space as an airport service attribute, and how the territoriality of passengers is moderated by their age and cultural background. Participants were grouped depending on their age and nationality for a comparative study. The results from the Repertory Grid Technique (RGT) and open-ended questions supported the conclusion that passengers of different age and cultural backgrounds perceive personal space differently, and their service satisfaction would be partially affected by the availability of personal space within the airport terminal. These findings suggest a necessity for alternative LOS standards that are cost-effective and able to reflect changing age structure and cultural composition of air passengers.

1. Introduction

It is forecasted that 22% of the global population will be aged over 60 by 2050, growing from 8% in 1950 (Chang, 2013). According to [1]the ABS (2012a), the number of air passengers aged over 60 ('senior passengers' or 'SPs' hereafter) has almost tripled between 2001 and 2011, accounting for 15.8% of the total arrivals in Australia. Despite the increasing importance of SPs, relatively little attention has been given to the implications of this growing population for transport facility planning (Van den Berg et al., 2011).

Ageing of the population will mean that services at airports will need to evolve as well. According to a recent Australian census (ABS, 2012b), more than 30% of Australians aged over 60 have at least one disability, and this rate increases to two-thirds for Australians aged over 80. Some of the likely physical and psychological changes due to ageing include vision and hearing loss, impairment of the shoulder joint, reduced cognitive functions and stamina, and greater cautiousness and anxiety (White, 2004; Wolfe, 2003). The effect of age in related studies suggests that, compared to younger passengers, on average, SPs are more likely to experience challenges for airport activities such as walking, standing in a queue, and using self-check-in kiosks (ABS, 2009; Metz, 2000; White, 2004; Wolfe, 2003).

In particular, the changes in human functioning due to ageing may necessitate modifications in airport designs such as terminal layout, lighting, signage, acoustics, and waking distance (Wolfe, 2003). As a result, the ageing of passengers would increase the importance of the ergonomics of devices and facilities, as well as the service strategies of operators (Caves and Pickard, 2001; Chang and Chen, 2012; Wolfe, 2003). Thus, identifying the different service needs of older passengers and younger passengers is important from the passenger service satisfaction perspective. Furthermore, the airport experience may affect the overall travel experience of passengers because the long-distance travel experience of passengers often begins and ends at the airport (Martín-Cejas, 2006). Consequently, the airport experience of international visitors would be of interest to all providers within the tourism supply chain.

In practise, the Airports Council International (ACI) and the International Air Transport Association (IATA) suggest "per-passenger-space" as an airport service indicator. Per-passenger-space is defined as the service area divided by the number of occupants. Since Fruin, 1971 study on pedestrian planning and design, per-passenger-space has remained as a fundamental measurement of

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[1] Australian Bureau of Statistics.

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service level in many public areas, including the airport terminals for more than three or four decades to measure operational performance and efficiency within terminals (Ashford, 1988; ACI&IATA, 1996; IATA, 2004). For instance, if the space available per passenger is less than 0.6 m^2, the airport is considered to be in a state of 'system breakdown', where the comfort and safety of passengers cannot be guaranteed (Correia and Wirasinghe, 2004). However, while this approach to per-passenger-space might be appropriate from an operational management perspective, it assumes passengers have homogenous preferences in regards to their personal space and mobility demands.

The 9th IATA ADRM[2] (2004) (the 9th ADRM hereafter) suggests that the space required to offer an economic level of comfort for passengers should be determined with passengers' behaviours and expectations in mind. Comfort is defined as 'the pleasant state of physiological, psychological, and physical harmony between human beings and their environment' (Slater, 1985). Ahmadpour et al. (2014) categorised passenger's perceptions in relation to comfort experience during the flight in eight themes, including peace of mind, physical wellbeing, proxemics, satisfaction, pleasure, social (e.g., neighbours and crew), aesthetics, and association. In particular, the term 'proxemics' is defined in relation to concerns for autonomy, control, and privacy that the passengers potentially achieve within the limits of their given personal space (Ahmadpour et al., 2016; Hall, 1963). Early on, Hall (1966) emphasised that different cultures have different proxemics patterns with wide individual and cultural differences in spatial needs. Hall and Hall's study (1990) suggests the possibility that the adequacy of per-passenger-space may vary depending on their socio-demographic characteristics such as age and national culture, and the size of personal space that individuals prefer in a crowd is linked to the discomfort when others intrude it.

From observations and interviews with American adults, Hall (1966) also compiled the descriptions of the four interpersonal distance zones. At an intimate distance (up to 0.45 m), the presence of the other person is clear and may at times be overwhelming. Personal distance (up to 1.2 m) is reserved for family and friends, while social distance (up to 3.6 m) is for impersonal business. At a public distance (up to 7.5 m), fine details of the skin and eyes, or even the details of facial expression and movement, are no longer visible. In the aviation context, Ahmadpour et al. (2014) have used the intimate distance (0.45 m) as an optimum personal space guideline for the leg space and the average lateral distance between two passengers in economy class of modern aircraft. It should be noted, however, that the estimates of the four interpersonal distance zones might vary with differences in personality and environmental factors (Hall, 1966). Although there have been several other studies dealing with aviation service quality in a cross-cultural setting (Cunningham et al., 2002; Park, 2007; Park et al., 2005), passengers' profiles such as age and cultural background have rarely been reflected in the assessment of terminal capacity along with the service expectations of passengers. One exception is Ahmadpour et al., 2014 study, which addresses the impact of personal space for passenger comfort in the context of the aircraft cabin space.

This paper aims to establish whether, and to what extent, passengers perceive personal space as a service attribute at airports. In addition, the paper attempts to examine how this relationship between personal space and service level is moderated by age and cultural background, by gauging the size of the minimum personal space preferred by passengers and examining the extent to which passengers would try to protect their personal comfort zones. We also discuss the findings' potential implications for future design standards of airport terminals and facilities. If the size of the minimum personal space preferred by passengers varies depending on the passenger profiles such as age and cultural background, the uniform application of the IATA's terminal design standard is not necessarily appropriate for all airports around the world.

[2] Airport Development Reference Manual.

2. Related studies

2.1. Level of service (LOS)

Service satisfaction can be defined as "a function of a consumer's experience and reactions to a service provider's behaviour during the service encounter, and also a function of the service setting" (Nicholls et al., 1998). Barsky (1995) defines consumer satisfaction as "the meeting and/or exceeding of customer expectations". Word-of-mouth communications in a face-to-face manner often have a stronger impact than any forms of advertisements or promotions (Herr et al., 1991). This is particularly the case in an era of social media where people search online for travel information and listen to others (Xiang and Gretzel, 2010). In the case of airport operation, creating a good reputation can distinguish an airport from its competitors (Park et al., 2005). Satisfied air travellers may return to an airport, or recommend the airport to others with favourable comments (Pearce, 1988). On the other hand, dissatisfied air travellers may find alternatives on their next trip, and some of these travellers might damage the airport's reputation in the industry via word-of-mouth communications (Reisinger and Turner, 2003). Level of service ('LOS' hereafter) in the aviation context has been a research interest of scholars over the past three decades (Ashford, 1988; Brunetta et al., 1999; Correia and Wirasinghe, 2004, 2007, 2008; Yen et al., 2001; Yen and Teng, 2003). In fact, in an airport setting it is common to associate airport service quality with the operational performance and the passenger capacity of airport passenger terminals. For example, Kiyildi and Karasahin (2008) proposed a fuzzy model to calculate the required number of check-in counters to provide passengers with a suitable and facilitated terminal environment.

The widely applied IATA standard of airport terminal design uses per-passenger-space as the fundamental unit of LOS measurement. LOS is more or less affected by the available personal space and widths of pathways within the terminal (ACI&IATA, 1996; Correia and Wirasinghe, 2007). This is then used to design airport terminals in order to meet passenger comfort and service satisfaction (ACI&IATA, 1996). The 9th ADRM defines LOS as a range of values that indicate the ability of supply to meet demand depending on the levels of delays, passenger flows, and comfort. In the 10th edition of the ADRM, IATA (2014) recommends LOS standard in the waiting areas and processing facilities for departure terminals. Table 1 shows how the most recent LOS standard from IATA are segmented into three levels—overdesign, optimum, and suboptimum—for space provision and waiting time. Temporal LOS is measured by the amount of time that passengers need to wait to be served, while spatial LOS is measured by square metre per occupant or occupancy rate of seated passengers.

Passengers prefer to maintain a buffer zone at all times in order to secure freedom of movement and to avoid chances of physical contact with other passengers (IATA, 2004). The buffer zone concept can be operationalised by measuring inter-person spacing (hereafter 'IPS'), which is the distance between the centre points of the bodies of two individuals. The 9th ADRM recommends IPS of at least 0.8 m–0.9 m between passengers. If passengers were inadvertently forced to stand closely due to high traffic at the check-in area, then IPS would be almost equal to the body depth so that passengers would be unable to move (Thompson and Marchant,