Airport security and screening satisfaction: A case study of U.S.

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ABSTRACT

The study analyzes the perception of airport safety by travelers, and how it is related to satisfaction with passenger screening experiences and the perception of public transit safety. It uses the Omnibus Household Survey data collected by the U.S. Bureau of Transportation Statistics and estimates a structural equations model. It finds a positive relationship between Screening Satisfaction and Screening Safety and a positive relationship between the perception of Public Transit Safety and Screening Safety. A lack of experience with using public transit is also found to contribute to travelers perceiving lower levels of Screening Safety at airports, and females compared to males perceive a lower level of Screening Safety. Finally, the study finds causality from a traveler's satisfaction with the screening process to safety perception.

1. Introduction

Airport security and screening were significantly enhanced after the events of September 11, 2001. However, they caused long waiting lines at screening points and unpleasant experiences for some travelers leading Blalock et al. (2007) to argue that the inconvenience it creates could reduce travel demand and satisfaction with airport security. Indeed these authors report that baggage screening, for instance, reduces passenger volume at all originating airports by 6% and 9% at the 50 largest U.S. airports. The General Accounting Office (2001) also adds that it could lead to travelers switching to driving and increasing fatalities from highway crashes. And, a recent survey by the Travel Leaders Group (2015) found that 88.4% of American consumers were satisfied with or neutral about airport security measures, while 44.4% were satisfied with how long it took to get through airport security, thus suggesting a need to improve and shorten the length of the screening process. Doing so even at one airport could reduce travel delays, improve on-time performance and as Coughlin et al. (2002) note, lead to a feeling by passengers that air travel is safe, as well as to beneficial spillover effects at other airports. However, shortening the screening process may increase security problems at the airports, as would be the case if it results in lowering security levels especially at the airports

having problems with their security screening processes, and that means many airports. For example, the American Broadcasting Corporation (ABC) News (2015) reported an internal investigation of the TSA which revealed a potential security problem with the screening processes at many U.S. airports. Therefore, a potential trade-off exists between increasing traveler satisfaction by shortening the TSA screening process, and increasing it through detailed passenger screening thereby increasing safety. If one views the screening process as a deterrent then it becomes difficult to determine this tradeoff because of the uncertainty which characterizes security and makes it difficult to predict the impact of deterrence and determine its effectiveness (OECD, 2009).

Because travelers do not know the exact level of the security which the TSA provides, they perceive their confidence in it on the basis of their observations and experiences at the screening points as well as information from other sources. Although the actual level of security is important to prevent any physical harm to travelers, from the airline industry, the airport authority and TSA standpoints a traveler's perception of safety is of utmost importance because it determines travelers' willingness to take airplanes and pay for the cost of the screening process. Therefore, the question is how satisfied are travelers with the safety processes at the airports and how is this satisfaction related to their perception of airport safety? The objective of this study is to answer this question and identify the factors affecting traveler satisfaction with the TSA screening process and traveler confidence in TSA's safety measures in ensuring airport safety. In particular, this study examines how

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travelers' satisfaction with TSA's screening may affect their perceptions of the safety of traveling by an airplane.

It contributes to the existing literature on airport safety and more generally to the literature on safety and satisfaction with services by examining not only the direct relationship between satisfaction and safety in the context of air travel, but explicitly, how the general perception of travelers toward transit safety contributes to their perception of airport safety. It identifies the factors which may contribute to a traveler's dissatisfaction with the airport screening process and a traveler's confidence in screening safety. Furthermore, it examines the causality between screening satisfaction and safety perception and its findings can be used by the TSA and airport authorities to improve passenger satisfaction and safety perception at airports. The rest of the paper is organized as follows. The next section deals with literature review and it is followed by the conceptual framework, data, estimation and results, hypotheses testing, discussion and conclusion.

2. Literature review

Among the few studies on airport security screening and traveler experience is that of Babu et al. (2006) who suggest that airline passengers should be classified into different groups, for example by putting different color codes on their boarding passes to signal their threat probability levels, and then varying the number of checks for each group. They argue that their approach is beneficial when the threat probability is constant for all passengers. Along similar lines Veisten et al. (2011) suggest adopting a risk-based airport security process whereby passengers apply online to be pre-qualified for different levels of screening. After background checks, most of those classified as low risk will then go through reduced screening at checkpoints while a random sample goes through detailed screening. A variation of these approaches is already used in the US by the Transportation Security Administration (TSA) "based upon presumed difference in risk levels for passengers" (Babu et al., 2006, p. 635). Travelers presumed as posing security risks are sent to different check stations and subjected to detailed body searches and pat downs. Since it is difficult to know with certainty the individuals who pose the most risk, this approach has the undesirable effect of subjecting wrong people to excessive searches. Cox et al. (2011) also note another risk, which is that terrorists may modify or adapt their activities to existing security efforts making their detection difficult. And, according to O'Malley (2006), they may change their tactics by recruiting people who do not meet existing profiles resulting in missing those who should be subjected to extensive searches. McLay et al. (2005), referencing Barnett (2001) and Chakrabarti and Strauss (2002), also note that passengers can defeat such a system through trial and error. These suggest that perhaps a rule-based approach which accords everyone the same degree of risk and scrutiny (O'Malley, 2006) be used or as Garrick (2004) suggests, focusing on actions with bigger payoffs such as using technology to speed up passenger screening, controlling personnel access to aircrafts, and reducing missile attacks.

Around the same time as Garrick (2004) made his suggestions, the TSA introduced more advanced screening equipment and improved employee training to shorten waiting times and increase traveler satisfaction with the screening process. For example, it introduced a computer-assisted passenger prescreening system (CAPPS) which partitioned travelers into two groups, then CAPPS II which partitioned travelers into three groups and finally Secure Flight designed to partition travelers into risk classes including those not permitted to fly. And, it required that the airlines flying to the U.S. submit their passenger lists to U.S. immigration 30 min before departing. These increased screenings have potential to affect passenger waiting times, the level of passenger satisfaction with the screening process and its consequent effect on a passenger's perception of screening safety as some studies have shown. For example, Gkritza et al. (2006) using U.S. data for 2002 and 2003, found that in both years waiting times at security screening check points were significant determinants of passenger satisfaction.

Complementing the results of these studies Beck et al. (2016) show that passengers prefer shorter times at check points and Alards-Tomalin et al. (2014) found that those who perceived higher levels of threats to their dignity had lower levels of safety feelings, and those who perceived higher levels of professionalism of the airport security officers had higher levels of safety feeling and flying intentions. Although they found that those showing high levels of enplanement intentions perceived high levels of safety, age did not affect these intentions. However, those perceiving threats to their dignity had low levels of enplaning intentions, and there was no positive relationship between perceived professionalism of security officers and women's safety feelings. Additionally, Hasisi and Weisburd (2011) found that safety checks contributed positively to passenger safety feeling during flights, while Güreş et al. (2011) found that those highly satisfied with waiting time perceived safety as high, and no relationship between passengers' socio-demographic characteristics and their perception of safety.

Another dimension of airport security is how it affects the utility of travel and mode choice. Srinivasan et al. (2006) studied this dimension and found that those who had a high perception of security also had higher levels of utility for air travel and were more likely to fly. They also found that the utility of air travel decreased with increases in screening and boarding times, perhaps due to the rigorous screening processes at airports and that there are no "differences in the impact of security perceptions on mode choice based on demographic characteristics such as gender and marital status" (p. 14). These findings led Srinivasan et al. (2006) to suggest that the success of any aviation security strategy in causing passenger diversion between the modes depends upon how travelers perceive it and that the TSA should use advertising to educate the public on the merits of the security measures at the airports. Further, they suggest that the perceptions of travelers about airport security could be important in mode choice. If so, it would be consistent with Rossiter and Dresner (2004) finding that direct charges for airport security and longer passenger screening time result in substantial traffic diversion and increase highway fatalities. If this traffic diversion and its consequent safety effects are to be avoided then a need exists to change the un-paced airport passenger screening process currently used whereby screening time per passenger is flexible, to a paced screening process which limits screening time per passenger. Although such a change could compromise security somewhat, Leone and Liu (2011) show that it could reduce waiting time by 40% and cut cost by 1%, and serve 200 passengers per hour. Adding to these studies, Ringle et al. (2011) found a positive relationship (causality) between the perception of safety by airline passengers and customer satisfaction, as well as a significant positive causation from safety perception to customer satisfaction among leisure travelers but not among business travelers. And, Tasci and Boylu (2010) found that a positive perception of safety and security led to a greater trip satisfaction while Song and Schwarz (2009) found that unfamiliarity with one's environment resulted in higher levels of perceived risk, a result relevant to irregular airport users.

Though few, the existing literature reveals various aspects of airport safety perception and satisfaction and point to some potential factors which could affect them. Combining these factors and expanding them, this study examines their causal relationships with passenger satisfaction with airport screening processes and safety perception, and formulates a conceptual model to link them.