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Abstract: This paper deals with the passenger screening procedure at airports. A survey on the acceptability of security scanners was conducted in France in July 2012 with a sample of 458 air travellers. Acceptability was operationalized in terms of behavioural intention to undergo scanning if such scanners were implemented at French airports. The great majority of the respondents would choose to pass through a security scanner whatever the representation used by the system to display potential hidden objects (a fuzzy image of the body of the passenger or a generic avatar). Despite their possible lack of knowledge on the efficiency of the technology, most of the respondents trusted security scanners to detect hidden explosives. Finally, the majority of the respondents did not perceive such scanning as a breach of fundamental rights. By way of discussion, a model is proposed which expresses that acceptance would emerge from a cognitive compromise between expected benefits, accepted risks, and tolerated constraints. The compromise would be shaped by trust and perceptions, which would themselves be shaped by knowledge and socially shared affect and values.

Keywords: Acceptability; Acceptance; Cognitive compromise; Opinion survey; Trust; Security scanner.

1. Introduction

France, as a Member State of the European Union (EU), the European Civil Aviation Conference (ECAC), and the International Civil Aviation Organization (ICAO), has become involved in strengthening aviation security measures. This paper focuses on a specific ground security measure at airports, namely the passenger body screening.

Indeed, international airports have progressively been equipped with walk-through body screening scanners based on X-ray or millimeter wave technologies. These systems are officially termed 'security scanners' in the EU (see European Commission, 2010).

Security scanners are capable of detecting objects under clothes; not only metallic objects such as knives and arms but also non-metallic objects such as plastic and liquid explosives. These imaging technologies provide either images of the body of the person who is scanned or images of a generic avatar that resembles a human outline.

Advanced imaging technology being at the heart of security scanners, these systems are a source of controversy, notably in the form of privacy, health, and performance issues. Public concern about these issues raises the problem of the acceptance of security scanners.

The present paper aims to consider the psychological aspects of the acceptability and acceptance of security scanners at airports. Acceptability and acceptance can be operationalized in terms of intentional behaviour (e.g. Ausserer and Risser, 2005). When air travellers' intentional behaviour is considered before the deployment of the technology, it is termed acceptability; after the deployment, it is termed acceptance (Schade and Schlag, 2010).

Section 2 deals with three issues that may influence air travellers' acceptability and acceptance of security scanners: the privacy and fundamental rights; the passenger's health; the systems' performance. Section 3 presents two empirical studies of the literature on the acceptance of security body scanners. The first study was carried out with air travellers in New York City and Tel Aviv, the second one with air travellers in the UK. Section 4 presents and discusses the results of an opinion survey on the acceptability of security scanners carried out in France in July 2012. A model of acceptance that takes into account the results of the three studies is proposed at the end of the paper.

2. Issues that may influence the acceptance of security scanners

2.1. Privacy and fundamental rights issues

The protection of privacy and fundamental rights is recognized by governmental institutions as being a primary issue with the use of security scanners (e.g. Cavoukian, 2009; UK Department for Transport, 2010; U.S. Department of Homeland Security, 2011).

About Europe, the following parts of the Charter of Fundamental Rights of the European Union are pertained to the use of security scanners: human dignity; respect for private and family life; freedom of thoughts, conscience, and religion; non-discrimination; the rights of child; ensuring a high level of human health protection; protection of personal data (European Commission, 2010, p. 4).

Whatever the representation displayed on the screen, personal data are processed. According to the European Union, "personal data" means any information relating to an identified or identifiable individual ("data subject"), and "automatic processing" includes the following operations if carried out in whole or in part by automated means: data storage, carrying out logical and/or arithmetical operations on those data, and their alteration, erasure, retrieval or dissemination (Council of Europe, 1981).

From the researchers' point of view, for example, Olga Mironenko from the University

of Oslo (Norway), the use of body scanners seriously impacts the rights to privacy and data protection even if it may contribute to maintaining a high level of security, notably regarding terrorism (Mironenko, 2011). She noticed that the images created by body scanners could be considered personal data and that the use of these data, even not recorded, fell within the definition of processing (i.e. any operation performed upon personal data). Finally, she emphasizes that the storage and retrieval of images is the most controversial point for discussion.

According to Raphael Gellert and Serge Gutwirth from Vrije Universiteit Brussel (Belgium), even though the images produced by body scanners are anonymous, they "must not necessarily be considered as non-personal data" (Geller and Gutwirth, 2013, p. 527).

In view to these conclusions, it would be interesting to know the passengers' opinions on breaches of privacy and fundamental rights regarding the use of security scanners. It would also be interesting to know their trust in airport authorities to protect personal data. Indeed, the points of view of experts and the public may not coincide. It may be that the problem of the acceptability of security scanners in terms of privacy is not a real one for the majority of passengers. An argument for this view is the case of video surveillance. It is possible that the decisions made by institutions to increase aviation safety are seen by citizens as justified because the threats are objectivized (Dumoulin *et al.*, 2010). Another argument comes from the domain of biometric technologies: people tend to consider being under surveillance as natural (Crampton, 2007) and adopt a level of social indifference (Van Den Hoogen, 2009).

Therefore, besides investigating the air travellers' views on potential breaches of fundamental rights, it would be interesting to know whether they consider passing through security scanner to be normal and unquestionable regarding the threat of terrorism.

2.2. Health issues

Security scanners also raise health concerns because they are based on technologies exposing the passenger to electromagnetic radiation. Two reports about health risks are presented, one based on X-ray backscatter technology and the other on millimeter wave technology.

The Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR), an advisory structure of scientific committees and experts in the field of consumer safety, public health and the environment, was requested by the European Commission to identify and quantify the health risks related to the use of security body scanners based on X-ray technology. According to the report of the SCENHIR published in 2012, cancer risks cannot be entirely excluded from body scanning technology, but if they exist, their magnitude would be below the baseline cancer risk due to other factors.

A second report issued by the French Agency for Environmental and Occupational Health (AFSSET) in 2010 at the request of the French government focused on acquiring a complete understanding of the use of security body scanners based on active millimeter-wave technology. The Agency Concerning concluded that no thermal effect on exposed tissue was expected following a security body scan. The agency reported that the power radiated by such a body scanner was much weaker than the power radiated by other sources of radio frequencies used in everyday activities, such as microwave ovens or cell phones.

The conclusion emerging from the two reports is that both backscatter and active millimeter-wave security body scanners are nearly harmless to the health of passengers. However, another interesting conclusion comes from David J. Brenner in his paper of 2011 on X-ray backscatter scanners. According to him, the radiation doses associated with backscatter scanners that are probably safe for

most of individuals may have long-term effects on the entire exposed population. Dr. Brenner added that what one could argue is that risk among population would be more than balanced by the benefits of reducing the risk of a terrorism event.

In the light of those conclusions contrasting with the alarmist titles in the mass media (e.g. "Radiation doctor says TSA naked body scanners can cause cancer"; NaturalNews, January 05, 2012), it would be interesting to investigate the passengers' views about the effect of passing through a scanner on their health.

2.3. Performance issues

With regard to the performance of security scanners, there are two major issues: the capability to detect metallic and non-metallic objects carried under clothing; the rapidity of the algorithms used to analyze data and provide the results displayed on the screen.

First, the capability to detect hidden objects is a matter of contrast, and explanations of that topic are beyond the scope of this paper (for details see, for example, Appleby and Anderton, 2007). However, if a potential threat is identified, the passenger is invited to undergo a manual search by a security officer. In addition to being less efficient and more time consuming than scanning, a manual search is presumed to be highly intrusive (e.g. Langerman, 2010). The benefits gained by using security scanners would be negated if the systems are not reliable. A security scanner can be considered unreliable if the rate of false positives and/or the rate of false negatives are too high. False positives occur when a security scanner highlights objects that do not constitute threats and false negatives when threats are not detected.

Second, the rapidity of data processing will have an impact on passenger flow. Using security scanners is presumed to be faster than performing manual searches: delays are in the terms of seconds for scanning, and of minutes for manual search. Short rapid inspection times would likely account for an enhanced passenger's acceptance of security body screening as well as it would be a benefit in terms of airport authorities (Holguín-Veras *et al.*, 2012).

To recap, the ideal performance of security scanners would be their ability to detect both metallic and non-metallic threats in a few seconds with a high detection rate and low false-alarm rate. That kind of technical acceptance should intersect with the psychological acceptance of security scanners to ensure harmonious and efficient security controls. Hence, it would be interesting to investigate the passengers' views about the performance of security scanners.

The next sections deal with three studies on passengers' views of those technologies. The first study was carried out with air travellers in New York City and Tel Aviv, the second one in the UK. Both studies come from the review of the literature on security body scanners. The presentation of the third study that was carried out in France in 2012 is the primary goal of the present paper.

3. Two empirical studies in the literature on acceptance of security body scanners

3.1. Leo and Lawler's study with air travellers in the USA and Israel

The first study, reported by Leo and Lawler (2007), focuses on the acceptance of backscatter machines. The investigated factors were sensitivity to privacy; perception of a security threat; knowledge of the functionality of screening technologies; knowledge of imaging and information storage by screening technologies and of their usage. The participants were experienced air travellers and they received the instrument survey questionnaire by e-mail. The responses were scored on a 6-point Likert-type scale going from none to very high, and the means (*M*) were calculated.

The survey conducted in New York shows that the 25 participants were not highly sensitive either to privacy (M = 3.84) or to the severity of the threat of terrorism (M = 3.64). They were less perceptive of the effectiveness of screening technologies (M = 2.68), less knowledgeable about the functioning of screening technologies (M = 1.52), and less knowledgeable about information storage by such technologies (M = 0.84).

The survey conducted in Tel Aviv shows a very high perceived security threat (M = 5.00) and perception of the effectiveness of screening technologies (M = 5.00) despite no knowledge of the data storage, techniques, or usage of the technologies (M = 0.00) and no privacy sensitivity (M = 0.00). The willingness to accept the personal intrusion presented by screening technologies was very high (M = 5.00).

Leo and Lawler concluded that the "culture of security alert, if not fear, and the tangibility of security threats in Israel" (Leo and Lawler, 2007, p. 17) might have made knowledge of screening technology not necessary for the Tel Aviv participants' receptivity of the technology.

The above study is very interesting because it illustrates the relationship between perceived risk and willingness to accept personal intrusion by screening technologies. Leo and Lawler's study shows also the possible absence of relationship between the knowledge of screening technologies and the acceptance of them. If acceptance of security scanners (i.e. intention to undergo scanning) is considered as the result of a decision-making process, then the acceptance might be influenced by the affect heuristic. The affect heuristic, which is a mental shortcut that relies on salient affective sides of mental imagery, is used in decision-making involving judgment of risks and benefits (Finucane *et al.*, 2000; Slovic *et al.*, 2004). In other words, the differences between participants' attitudes in New York and Tel Aviv may be explained by the use of a shortcut based on affect (here, fear) which would have biased the responses in Tel Aviv's study.

3.2. Mitchener-Nissen, Bower, and Ketty's study with air travellers in the UK

The second study, reported in Mitchener-Nissen *et al.*, (2012), was conducted in July 2010 at Manchester Airport. Two questionnaires were used to investigate the passengers' attitudes towards whole-body scanners: the first questionnaire comprised two central questions on whether being for or against those scanners and the preference between a scan and a pat down; the second questionnaire included 10 opinion statements about the necessity of such scanners with regard to threat of terrorism; their impact on flight safety; issues of dignity and privacy; perception of threat to health.

Regarding the first questionnaire (N = 225), 88 percent of the respondents would choose a scan over a pat-down. The main reasons of their choice are, in order of frequency: less intrusiveness; speed; safety/security. The main criteria for those who preferred the pat-down option were familiarity with pat-down search and health concern about scans.

Regarding the second questionnaire (N = 186), there were two groups: one group was provided detailed information on backscatter whole-body scanners, whereas the control group did not receive any information. The results show that the participants who received information had more positive attitudes towards body scanners than those who did not.

The paper of Mitchener-Nissen *et al.* (2012) is interesting because the preference between scanners and manual searches was investigated in detail; the reasons of the preference were questioned. Their study shows the impact of knowledge on attitudes, whereas having knowledge seems not to have been a major factor in Leo and Lawler's study. The comparison of the two papers suggests that the culture and society under study have to be

taken into account to understand how acceptance is formed.

4. A French opinion survey on the acceptability of security scanners at airports

The study carried out in France in 2012 aimed at analyzing air travellers' acceptability of security scanners. The term acceptability is chosen because security scanners are not still deployed at French airports. The intention to undergo scanning and other topics reviewed in the previous sections were investigated using a survey questionnaire.

4.1. Method

The method consisted of a face-to-face survey conducted by the public poll institute TNS Sofres in July 2012. Outsourcing the survey to a research institute was motivated by a concern of representativeness of the results. Respondents were interviewed at home. The weighted sample size of those who had flown at least once in the previous 12 months was N = 458 (234 men and 223 women). This was derived from a representative national sample of 2000 people aged 15 and over (quota sampling approach).

The questionnaire contained 14 closed items that were developed from the literature reviewed in the previous section and discussed with TNS Sofres.

Two items were expressed in terms of trust. Indeed, trust can be defined as "a psychological state, resulting from knowledge, beliefs, and assessments related to the decision-making situation, which creates confident expectations" (Rajaonah, Anceaux, and Vienne, 2006, p. 102). Therefore, perceived security scanner technology's ability to detect hidden threats as well as perceived airport authorities' performance to ensure confidentiality of data provided by the scanner may be investigated through the concept of trust.

Three items were related to the perceived breaches of privacy and fundamental rights posed by security scanning. A YES/NO response format was used according to an implicit assumption that a violation of fundamental rights would not be perceived in degrees.

Two items on the acceptability of security scanners investigated behavioural intention between three alternatives: undergoing scanning, undergoing a hand search, or giving up flying (multi-choice response). The first item focused on security scanners providing a fuzzy image of the body of the passenger, the second on those providing an avatar. The English translations of the items are presented in Table 1.

A brief presentation of the topic was introduced to the participants, with no information concerning advanced imaging technologies. The English translation of the presentation is as follows: "The authorities are examining the possibility of deploying security scanners at French airports. As these scanners are capable of detecting explosives, they are much more than portal metal detector systems. Potential threats are visualized on a screen that displays either a fuzzy image of the body of the passenger or a generic avatar that is identical for all passengers. Only authorized security officers are allowed to examine what is displayed on the screen. Lastly, the data provided by the scanners are not stored".

The questions were asked in a different random order for each interview. Slides of a fuzzy image and of an avatar were shown three times to the participant: at the introduction of the questionnaire and at each of the two questions on acceptability.

Table 1: Items of the questionnaire: the studied factors underlying the questions are in the left column, the items of the questionnaire translated from French in the middle, and the response categories in the right column.

Studied factors	Items of the questionnaire	Response categories
1. Perceived threat of terrorism	*You feel terrorism threat as present*	4-point scale plus a 'No opinion' category: 'Strongly agree', 'Rather agree', 'Rather disagree' 'Strongly disagree',
2. Perceived health risk	*Passing through security scanners will have effect on your health*	
3. Perceived efficiency of using security scanners	*The use of security scanners would enhance control procedure times*	
4. Perceived social norm to undergo scanning	*Passing through security scanners is normal in the fight against insecurity*	
5. Trust in the technology	*You trust the security scanner technology to detect hidden explosives*	
6. Trust in institutions and organizations	*You trust airport authorities to guarantee anonymity and confidentiality of data provided by the scanner*	
7. Anticipated experience of embarrassment	*The visualization of a fuzzy image of your body on a screen by a security officer is embarrassing*	
	The visualization of a representation of your silhouette by a generic avatar is embarrassing	
	Manual search on your body by a security officer is embarrassing	
8. Perceived breaches of fundamental rights	*Security scanner inspection invades private life ('la vie privée' in the French version)*	YES/NO response
	Security scanner inspection invades freedoms ('les libertés')	
	Security scanner inspection invades dignity ('la dignité humaine')	
9. Acceptability of security scanners	*If security scanners providing a fuzzy image of the body of the passenger were installed at French airports, what would you do?*	Multiple-choice response (one response only): -Undergoing scanning -Undergoing a hand search -Giving up flying
	If security scanners providing a generic avatar were installed at French airports, what would you do?	

4.2. Results and Discussion

The results are divided into four sub-sections: acceptability; privacy and fundamental rights issues; health issues; and performance issues.

The percentage distributions of responses to the questions on perceptions and trust are presented in Table 2.

Acceptability

The acceptability of security scanners was investigated in terms of behavioural intention to undergo scanning if such systems were implemented at French airports.

More precisely, the respondents had to select one response among three alternatives: undergoing scanning, undergoing a hand search, or giving up flying (multi-choice response).

Two kinds of security scanner were investigated depending on the representation used by the system to display potential hidden objects, either a fuzzy image of the body of the passenger or a generic avatar. The results are shown in Figure 1.

With regard to security scanners providing a fuzzy image of the body of the passenger, most of the respondents (83.3 percent) would undergo scanning, whereas 13.4 percent would prefer a manual search, and two respondents would give up flying. In other words, the percentage of the respondents who were resistant to the scanning procedure, that is to say, those who chose either undergoing a manual search or giving up flying, was of 14 percent. On the other hand, the percentage of the respondents who intended to fly whatever the procedure at security control (either passing through a scanner providing a fuzzy image or undergoing a manual search) was 96.8 percent.

With regard to security scanners providing a generic avatar, the great majority of the respondents (84.6 percent) would undergo scanning, whereas 11.5 percent would prefer a manual search and one respondent would give up flying. The percentage of the respondents who were resistant to the scanning procedure was 11.7 percent, and those who intended to fly whatever the procedure at security control were made up 96.1 percent.

To recap, the great majority of the respondents would undergo scanning whatever the representation. These findings are remarkably similar to those in Mitchener-Nissen *et al*. (2012). Indeed, their study shows that the great majority of the passengers interviewed were in favour of the use of whole body scanners in airports, and they preferred a scan to a pat-down.

However, cause-effect relationships between perceptions and acceptability of security scanners were not investigated in this French study, whereas they were in Mitchener-Nissen *et al.*'s one. For example, these authors showed that the safety and security issues were the most frequently cited reason for explaining preference for whole body scanners, while the most cited reason for choosing a scan over a pat-down was intrusiveness of pat-down search.

Most of the respondents in France (70.2 percent) agreed with the statement that they felt the threat of terrorism to be present, whereas 27.1 percent disagreed. Furthermore, a very strong majority of the respondents (91.6 percent) agreed with the statement that passing through a security scanner was normal in the fight against insecurity (i.e. insecurity in a general way). It might be hypothesized from the results that perceived threat of terrorism and perceived social norm to undergo scanning had influenced the participants' intention to undergo scanning.

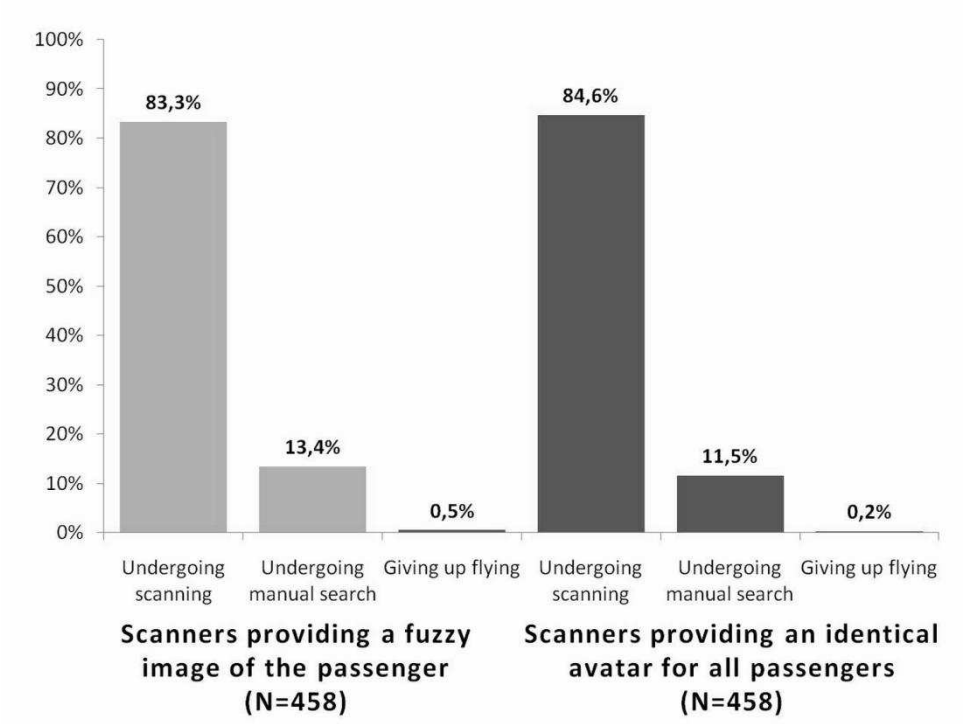

Figure 1: Percentage distribution of responses regarding intentional behaviour at the passenger screening procedure by security scanner type (one providing a fuzzy image and the other an avatar). The respondent had to select only one response from among the three proposed alternatives: undergoing scanning, undergoing a manual search, or giving up flying.

Table 2: Percentage distributions of responses to the questions using a 4-point scale.

Items	*Strongly agree*	*Rather agree*	*Rather disagree*	*Strongly disagree*	*No opinion*
Perceived presence of terrorism threat	28.8%	41.4%	18.7%	8.5%	2.7%
Perceived effect on health	6.2%	21.2%	28.9%	35.9%	7.8%
Perceived efficiency of using security scanners	22.1%	41.1%	19.6%	10.1%	7.1%
Perceived normality to undergo scanning	54.5%	37.1%	5%	2.1%	1.3%
Trust in security scanners	32.1%	48.8%	11.7%	4.8%	2.5%
Trust in airport authorities	31.2%	42%	17.3%	6.7%	2.8%
Embarrassment with a fuzzy image	6.4%	13.7%	31.9%	47.6%	0.3%
Embarrassment with an avatar	2.1%	11.9%	26.4%	58.4%	1.3%
Embarrassment with manual search	12.8%	27.3%	26.6%	32.5%	0.8%

Health issues

With regard to health issues, nearly two-thirds of the respondents disagreed with the statement that passing through a security scanner would have an effect on their health (Figure 2 and Table 2).

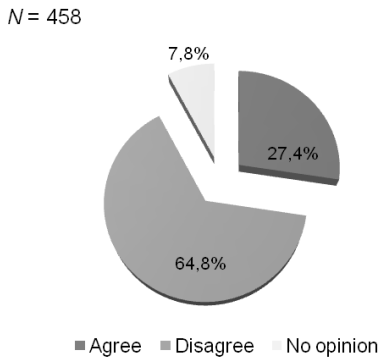

Figure 2: Percentage distribution of responses to perceived effects on health of passing through a security scanner ($N = 458$).

It is important to notice that more than half of the participants who were resistant to scan perceived that passing through a security scanner would have an effect on their health: 59.2 percent of the respondents resistant to the scanner providing a fuzzy image; 62.8 percent for the scanner providing an avatar.

In Mitchener-Nissen *et al*. (2012), only 2.7 percent of the respondents chose the pat-down option because of health concerns. Hence, their results are not fully similar to those of the French study, but it might be that they are not comparable. Indeed, the cause-effect relationship between resistance to the scanning procedure and health concerns can just be hypothesized in the French study.

Privacy and fundamental rights issues

Results on privacy and fundamental rights issues include three parts: perceived breach of dignity, freedom, and private life; perceived embarrassment due to the visualization of passengers' images by security officers and perceived embarrassment due to manual search; trust in airports' authorities to protect private personal data.

❖ As in shown in Figure 3, the great majority of the respondents perceived breaches of neither private life nor freedoms or dignity (respectively, 83.3 percent, 81.4 percent, and 79.9 percent of disagreement with the statement of perceived breaches).

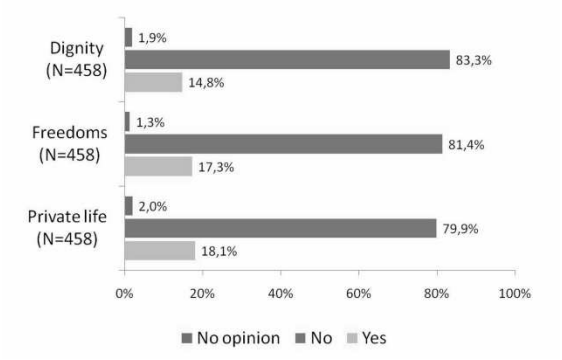

Figure 3: Percentages of the respondents who perceived a breach to the right to a private life, freedom, or human dignity.

Nevertheless, comparing the results of the 12.8% of the respondents who seemed to have been resistant to the scanning procedure with those of all the respondents, it seems that the "opponents" might have tended to be a bit more sensitive to breaches of their fundamental rights (Figure 4).

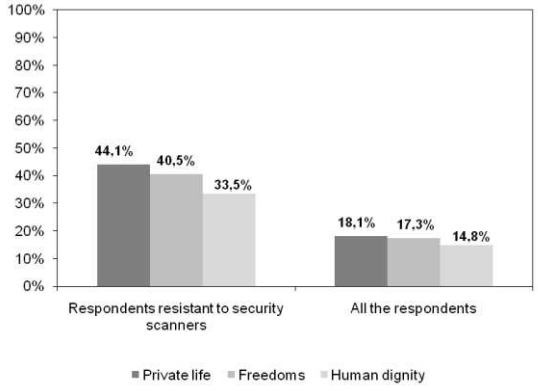

Figure 4. Perceived breaches of fundamental rights: Means of the percentages between responses regarding scanners providing image of the body of the passenger and responses regarding scanners providing a generic avatar: on the right, all the respondents; on the left, the respondents who were resistant to the scanning procedure.

❖ Concerning embarrassment due to scanning, as shown in Table 2, perceived embarrassment tended to occur more frequently with an image of the body of the passenger (20.1 percent) than with an avatar (14 percent).

However that may be, most of the respondents disagreed with the statement on embarrassment due to the visualization of image by a security officer (79.5 percent in the case of an image of the passenger; 84.8 percent in the case of a generic avatar).

Opinions on manual search were less clear-cut. Indeed, 40.1 percent of the respondents globally agreed with the statement that manual search was embarrassing and 59.1 percent disagreed.

❖ Concerning data protection, the majority of the respondents (71.3 percent) agreed with the statement that they would trust airport authorities to guarantee the anonymity and confidentiality of the data provided by security scanners (Table 2).

To recap the results, privacy and fundamental rights might have not been a problem for most of the participants. The question is thus whether there is a gap between experts and public's views of privacy and fundamental rights issues. The response may be that two levels of explanation are involved, namely the psychological and legal levels. The focus of research in the field of psychology is on passenger's perceptions, while the focus at the legal level is on the protection of the citizens according to the precautionary principle.

Performance

Performance issues were investigated with two items: trust in security scanners to perform required functions and the perceived efficiency of using security scanners to move the passengers through the security system. The responses are shown in Table 2.

A great majority of the respondents (80.9%) agreed to the statement that they would trust security scanners to detect hidden explosives. The statement that the use of security scanners would enhance control procedure times at airports was agreed with by 63.3 percent of the respondents.

Security scanners were thus perceived positively, despite the possible lack of knowledge of the respondents about the efficiency of the technology. Indeed, as mentioned earlier, no information about the functioning of security scanners was provided to the participants.

Recall that the Tel Aviv participants in the Leo and Lawler's study perceived the highest level of the effectiveness of screening technologies, despite no knowledge of their functioning (Leo and Lawler, 2007). Recall also that Mitchener-Nissen *et al*. (2012) showed that providing information to the passengers in the UK enhanced their attitudes toward backscatter scanners. The differences between those two studies plus the results in the French study reinforce the idea that the psychological process of acceptance of security scanners might not be based only on knowledge. How the acceptance of security scanners is formed might also involve specific values and beliefs shared among the members of the society and/or culture under study.

5. Conclusion

The study presented in this paper aimed to investigate the acceptability of security scanners at French airports. The results show that undergoing scanning would be chosen by the passengers rather than undergoing manual search, whatever the representation used by the system to display potential hidden objects (a fuzzy image of the body of the passenger or a generic avatar). The great majority of the respondents perceived breaches of neither their private life nor their freedoms or human dignity. Lastly, despite their possible lack of knowledge on the efficiency of the technology, most of the respondents trusted security scanners to detect hidden explosives.

The findings, especially in the light of those of the literature on security scanners, suggest that studying the acceptance of new technologies such as security scanners is more relevant if they are considered within their sociotechnical environment. Indeed, that provides other explanatory factors than perceived performance as traditionally studied in research on the acceptance. That is illustrated on Figure 5.

The hypothesis could be that the passenger's response to the stimulus of terrorism threat would emerge from the most satisfactory cognitive compromise between expected benefits, accepted risks, and tolerated constraints regarding each alternative (e.g. undergoing scanning, undergoing manual search, or giving up flying). The compromise would be shaped by individual's trust and perceptions that are themselves shaped by knowledge based on information from the decision-makers as well as by social and cultural values including socially-shared affect and worldviews (Peters and Slovic, 1996; Slovic, 1999).

The socially shared values might be the chief influence on the cognitive compromise that underlies the passengers' acceptance. The first implication of that viewpoint is the importance of taking into account the social and cultural factors for providing information to the citizens, particularly those who may be resistant to the scanning procedure.

The findings have also implication in terms of trust. Indeed, the results show that the respondents might have tended to trust both technology and institutions in the fight against terrorism. Nevertheless, trust is fragile and hard to be restored (Muir and Moray, 1996; Slovic, 1999). Therefore, recommendations should include guidelines to ensure public awareness of technologies limitations as well as security costs.

To conclude, the objective of future works is to use the proposed model in studies within sociotechnical environments of security at airports, concerning other technologies of security and/or other actors than passengers.

Qualitative approaches of social sciences will be prioritized through techniques such as face-to-face semi-directed interviews and/or focus-group discussions. Both techniques allow researchers to collect in-depth information, especially responses to such questions of "why" and "how", which would have been very useful to complement the quantitative analysis in the French study.

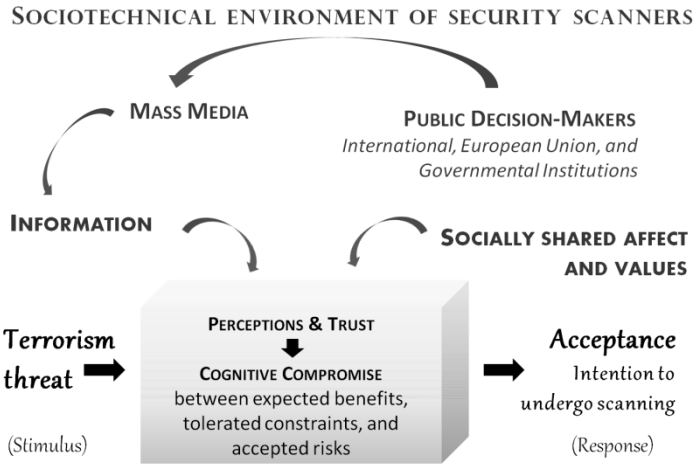

Figure 5: The passenger's acceptance of security scanners: Taking into account the influence of knowledge based on information from the decision-makers and the socially shared affect and values on the cognitive compromise that underlies acceptance.

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