ON THE CORRELATION BETWEEN CULTURAL BACKGROUND AND THE COMMERICAL AIRCRAFT ACCIDENTS

Hung-Sying Jing, Shang-Jee Peng, C. Joseph Lu
Institute of Aeronautics and Astronautics, Depertment of Statistics
National Cheng Kung University, Tainan, Taiwan, R.O. China

Abstract

Indirect proof of the relation between the world aircraft accident rates and the cultural background is established with the correlation study in this research. The most important culture variable found in this study is authoritarianism. The second is the favor. The authoritarianism is about three times more important than the favor. Combination of these two features can explain more then half of the tendency of the accident rates. Further study with more complete data is needed to make more concrete conclusion.

1. Introduction

Culture has been an issue in the community of aviation for several years. There are many discussions about the role of culture in aircraft accidents. However, it is seldom mentioned as a factor causing accidents. The basic requirement of accident investigation is to raise the fact with evidence. For the hardware part, it is always easier to identify the cause with factual proof. Unfortunately, more and more accidents are caused by lifeware, i.e., human, as the technology improved continuously. Talking about human, maybe it is still easy to identify the behavior of the crew causing the accident. However, the hidden defects of human are not easy to be found as external behavior. The culture is consequently used as the explanation of some peculiar behavior pattern.

Culture to us is like water to fish. When we live in it, we have no feeling about the existence of culture. Culture is the way of life, way of thinking, and the personality of a group of people. As accepted generally, culture includes three layers of meaning [1]. The outer layer is about explicit products. It contains the observable reality of language, building, art…, etc.. It is about the artifacts and products of a group of people. These explicit products represent the symbols of a deeper level of culture, i.e., the norms and values. It tells the sense of "right and wrong" of a group. It also determines the definition of "good and bad". Therefore, it is closely related to what in the mind of people is. Deep in the heart of a culture is the core which is about the existence. To answer the differences in values between cultures, it is necessary to face the basic problem of human existence.

The most basic motivation of life is to survive. It is also reasonable to say the basic goal of any gene is to keep on living. From time to time, every civilization fights daily with nature. With limited resources, human has to organize themselves to find the way to deal with the environments, solve the problems. When the problems of daily life are solved, people learned that the technique can be used again and again when the same problems are encountered. The rules are formulated thereafter. Further, if the rule of solving problems repeats again and again, it disappears from our awareness. It becomes part of our system of absolute assumptions. The same learning pattern exists in either each individual and a group of people. From the science of psychology, the learning behavior of human can be categorized by Rasmussen's knowledge-rule-skill framework [2]. The three levels of human performance correspond to increasing levels of familiarity with the environment or task. As a way of solving problem is used over and over again, it becomes skill-based and we don't have to pay attention to it. The unaware basic behavior of individual is called personality. On the other hand, the

unconscious basic assumption of the behavior of a group of people is called culture.

Culture is under awareness and also the root of action. Culture is man-made, confirmed by others, and passed on for next generation and newcomers to learn. Culture is the means by which people communicate and develop their knowledge about attitudes towards life. Culture is the fabric of meaning in terms of which human beings interpret their experience and guide their action [3].

2. Importance of cultural issue

Although the safe flight is a common goal of the international aviation community, the outcomes are different. It is generally acknowledged that degrees of aviation safety are not the same in different regions of the world. From the data collected by Boeing company [4], the accident rates, expressed by the number of fatal events per millions of departure, are quite different. The rates in Asia and Africa are obviously higher then which from Europe and America. This is attributed to many reasons. Human error is the one usually blamed. From the analysis of Boeing, one of the error frequently made by pilots is "flying pilot not adhere to procedures". Even the percentages of this error is again higher in Asia then in America. That is to say, although human plays a predominant role in aircraft accident, it is probably more reasonable to say that the "difference" of human is more fundamental to induce error.

The regional difference of accident rates represents there are something underneath the so called "human error" to cause accidents. From the history of aviation, it is worthwhile to note that the airplane is invented in the west. Those modern commercial airplanes are designed by the west also. The regulations are set by western countries. Moreover, even the standard operation procedures are also established in the same culture. It is fair to say that the whole system of civil aviation are constructed by the western people. By doing this, the way of solving problems is so natural for the west will be a big problem for the eastern people, which the western people may not even notice. So, it is not

correct to say that eastern people make more "error". It is quite possible that the higher accident rate for the east is only a problem of "culture conflict [5]"!

There is no doubt that the culture is an issue talking about flight safety. From the eyes of an oriental researcher as the author, culture conflict is a more appropriate view point to proceed the discussion. If the culture can be viewed as a variable [6][7], what would be the most significant one which can categorize the difference between cultures related to accident. From a Chinese mind, there are many "variables" mentioned to be related to the higher rates in Taiwan or Mainland China. For example, authoritarianism is one of them. Face is the other one. Favor is also mentioned as one of the variables. There are also other variables used to explain the culture influence on flight safety [8] [9], such as individualism. Although there are also several other articles talking about culture issue in flight safety [10][11][12], the more thorough study is still lacking. The goal of this research is to identify the culture variables from the correlation study on the accident rates of the world. Together with the database of cross-cultural study from the business [1], the meaningful questions are chosen from the database. The accident rates of the airlines from the world are collected through the world wide web. Basic statistical study is performed with discussions.

3. Method of Research

First of all, the accident rates from the airlines all over the world are collected. They are reorganized by the name of the country. Only the data of the past twenty years are used [13] because those accidents are more stabilized as technology improved and can be attributed mostly to human. On the other hand, the database of Trompenaars [1] including a survey of 15000 business staffs around the world is used as the culture bank. There are many questions about the relationships and rules, group and the individual…, etc.. To establish the correlation, ten questions are chosen to cover the culture dimensions as much as possible. The

results representing the culture difference of these questions from different countries are plotted in Fig.4.1, Fig.4.2, Fig.5.1, Fig.5.3, Fig.7.3, Fig.7.6, Fig.10.1, Fig.10.2, Fig.11.2, Fig.11.4 [1]. Combining the numbers from these figures and the accident rates, Table 1 is constructed. The numbers in parentheses in each column represent the mean value plus or minus the difference.

Because of the incompleteness of Table 1, only 14 countries have the data of all these ten questions. Since these questions are not equally important, the method of stepwise selection in regression analysis is used to find the most appropriate group of questions related to the rates. The Mini-tab software is used in this analysis. The results are listed in Table 2. It is found that the combination of questions Q4.2, Q5.1, Q5.3, Q7.3, Q11.4 has the lowest variation and the highest adjusted R square. The same questions are also selected with different method and different software S-Plus. That is to say, from the data given here, the questions related most to the accident rates are these five.

After recheck the data shown in Table 1, it is found that in total there are 21 countries answering these five questions. The regression analysis is again performed to analyze the correlation between the accident rates from these 21 countries and 5 questions. Tables 3 and 4 show the results. Tables 3 and 4 reveal the correlation of each question and different number of questions. It is interesting that, no matter from Table 2 or 3 or 4, the first question to be singled out is always Q7.3 with the highest R square and the lowest variation. Hence, the first meaningful question is Q7.3. Looking at the R square, here is the correlation coefficient, it is only 0.582 and the variations as high as 0.86946. Further, Table 4 contains the variations of different numbers of questions included. From this, it is found that the second question to be included to have the highest R square and the lowest variation is the Q11.4. The third is Q4.2. It is worthwhile to note, the R square and the variation changed very little when more questions are included. That means Q11.4 and Q4.2 are mostly incorporated in Q7.3. Again, Q7.3 is the most important question.

The meaning of Q7.3 can explain the tendency of accident rates to the degree only a little bit over 50%. The inclusion of Q11.4 and Q4.2 increases the explanation power only to a negligible degree. From the data given above, Q7.3 is uniquely important. If only one question, Q7.3, is used to find the regression line, the result is

$$Y = 4.994 - 0.0548X \qquad (1)$$
$$Y: accident\ rate$$
$$X: data\ from\ Fig.\ 7.3$$
$$Variation:\ 0.86946$$

4. Interpretation

The most meaningful question is singled out as Q7.3 although the correlation is only 0.582 and the variation is as high as 0.86946. From the technical point of view, it means the data is still far from being sufficient. Further, the number of fatal events per million departures only is also far too simple to describe the flight safety. On the other hand, the contents included in these ten questions are definitely not enough to cover the cultural background involved in aircraft accidents. Even so, Q7.3 is still the most important one compared to the others.

Now, it is very interesting to look at the meaning of Q7.3. This question is very simple. The boss asks a subordinate to help him painting his house. Obviously, most of the people from Europe and America would not paint the house. On the other hand, people from Asia would do it. Maybe western people will think this question is not a big deal. However, it represents more than half correlation with the aircraft accident rates all over the world. That is to say, the meaning of this question can explain more than half of the tendency of the world aircraft accidents.

To Chinese, this question means a lot about how Chinese people estimate benefit from doing something. Culture, from an operational point of view, is a way of estimating benefit and risk. When a man confront the problem of surviving in a given environment, he has to estimate what he can get and what he has to pay for what he does. In order to survive, every body hopes to

maximize the benefit and minimize the risk. If most of the people in a society have the same way of doing things, it becomes the content of culture.

The first thing this question represents is authoritarianism. China has a long history of 5000 years. China in the east is just like Greece in the west. Most of the eastern countries are more or less influenced by Chinese culture. Under the long lasted Chinese feudal system, most of the Chinese people are taught from childhood to worship the leadership no matter it takes places in family, school, or working place. The authoritarianism reaches its greatest strength in the Chinese bureaucracy. The reason for this is that Chinese people are educated by the feudal system that the authority will bring you more benefit and lower the risk in somewhere you can't imagine. It is always correct to behave like this. In this question, a subordinate is asked to do something not included in his normal work at his normal time. Further, it is personal to his boss. When Chinese face this condition, the first thing into his mind is "he is my boss". My boss has power to bring me trouble if I do not obey him. The psychological pressure builds up. For the sake of benefit and the risk, even the work is not right, the subordinate will do it. Power distance is another word for authoritarianism. It is doubted that several accidents were reported to be related to the high power distance in the cockpit [8]. Statistical results in this research provide another indirect proof for this.

The second thing that Q7.3 infers is the favor. The boss asks the subordinate to do him a favor. For Chinese, most of the people like to give their boss a favor. It is because a payback from the boss can be expected, especially when needed. Favor is a very fundamental feature deeply incorporated in Chinese culture. In the resource theory of social exchange [14], favor is a resource somebody pays to the people around him. Favor includes money, goods, service, and even emotional feeling. It is just like an investment. When the favor is paid, something in exchange is expected. This already becomes a social rule of Chinese people. To have a good relation with the people is more important than to get things done. Sometimes, paying favor to

expect something in return from some particular individual can be done by sacrificing public interests. This feature is revealed exactly in Q4.2, From the analysis shown in Table 3, Q4.2 also related to accident rates. Although the correlation is only 0.159, it is still the second highest. Further, as again confirmed in Table 4, most of the content in Q4.2 is already included in Q7.3. Q7.3 represents the correlation of 0.582 and Q4.2 0.159. If Q4.2 clearly represents the favor, it can be said that favor along has the correlation of 0.159 with the accident rates. Since it is included in Q7.3, which represents authoritarianism and favor, authoritarianism can be said to have the correlation of 0.423. If authoritarianism and favor are separable, authoritarianism will be almost three times more important than favor.

If somebody controls the distribution of some social resources, like the boss, the expectation is even higher. That is to say, most of the people like to give favor to anybody having power since more payback can be expected. Here, favor is then further strengthened by authoritarianism. They are inter-related and difficult to separate. Once the boss is expected to pay favor back to some of his subordinates, it will be very difficult for him to enforce the regulations. A person grows up in this kind of society, he will be educated not to pay too much attention to the laws, regulations, and procedures. Adhering to the boss is better than adhering to the procedures. Sometimes, this behavior is viewed as human error and causes accidents. Q11.4, the third highest correlation among the five questions, is a test for this attitude. Again, the meaning represented by Q11.4 is a natural result of Q7.3. It is also confirmed in Table 4.

5. Summary

The accident rates of the countries are collected in this research. Problems related to cultural background are combined with the rates to find the correlation between them. From the results of this study, it can be stated with some degree of confidence that the culture can not be ignored in the study of flight safety and culture is an indirect factor of aircraft accidents. Further, it is

found that the most important culture variables are authoritarianism and favor. The authoritarianism is about three times more important than the favor. Combination of these two can explain more than half of the tendency of the world aircraft accident rates. The correlation in this paper does not indicate any direct causal relation between culture and accidents. What it really means is that it points out the feasibility and the direction of further research.

References

[1] Trompenaars, F., Hampden–Turner C., Riding the waves of culture understanding diversity in global business, 2nd edition, McGraw-Hill, 1998.

[2] Rasmussen J, Jensen A. Mental procedures in real–life tasks: A case study of electronic troubleshooting. *Ergonomics*, Vol. 17, pp 293-307, 1974.

[3] Greertz C, *The Interpretation of Cultures*, Basic Books, New York, 1973.

[4] Statistical Summary of Commercial Jet Aircraft Accident–Worldwide Operations 1959–1993, Workshop about Flight Safety and Accident Investigation given by Boeing Commercial Airplane Group, National Cheng Kung University, 1994.

[5] Jing, H.–S., "The Oriental Culture can't Fly the Western Aircraft"(in Chinese), Science, China Times, January 1995.

[6] Roberts J, Golder T, Chick G. Judgement, oversight and skill: A cultural analysis of P–3 pilot error, *Human Organization*, Vol.39, pp.5-21,1980.

[7] Johnston N. CRM : Cross–cultural perspectives, *Cockpit Resource Management*, Academic Press Inc., 1993.

[8] Helmreich R, Merritt A. *Culture at work in aviation and medicine*, Ashgate, 1998.

[9] Braithwaite G, Caves R. Airline safety–some lessons from Australia, *The Aeronautical Journal*, pp.29-32, January 1997.

[10] Merritt A. Cross–cultural issues in CRM training, *Air Line Pilot*, pp.32-35, May 1995.

[11] Lehman C. How safe is our culture ? *The Journal for Civil Aviation Training*, pp.38-40, September 1999.

[12] Wang H. Culture in the cockpit–A study of Taiwaness pilots with different training background, MS Thesis, Embry-Riddle Aeronautical University, April 2000.

[13] Website: http://planecrashinfo.com/rates.htm

[14] Foa E, Foa U. Resource theory of social exchange. *Contemporary topics in social psychology*, edited by J. W. Thibaut, et al. General Learning, 1976.

Table 1 National accident rates and cultural background questions

Region (Region Accident Rate)	Country	AR	Fig 4.1	Fig 4.2	Fig 5.1	Fig 5.3	Fig 7.3	Fig 7.6	Fig 10.1	Fig 10.2	Fig 11.2	Fig11.4
Asia-Australia (1.79)	Australia	0	91(71+20)	69(58+11)	63(54+9)	58(45+13)	78(72+5)	82(61+21)	36(33+3)	82(68+14)	97(66+31)	98(84+14)
	China	2.96	47(71-24)	50(58-8)	41(54-13)	37(45-8)	32(72-40)	18(61-43)	22(33-11)	39(68-29)	57(66-9)	85(84+1)
	Hong Kong	0					73(72+1)	82(61+21)		65(68-3)	45(66-21)	89(84+5)
	India	3.45	54(71-17)	48(58-10)	37(54-17)	36(45-9)	66(72-6)	46(61-15)	30(33-3)	63(68-5)		91(84+7)
	Indonesia	3.25	57(71-14)	54(58-4)	44(54-10)	16(45-29)	58(72-14)	32(61-29)	25(33-8)	71(68+3)	52(66-14)	89(84+5)
	Japan	0.39	68(71-3)	55(58-3)	39(54-15)	32(45-13)	71(72-1)	45(61-16)	19(33-14)	63(68-5)	69(66+3)	80(84-4)
	Korea	2.83	37(71-34)	45(58-13)		41(45-4)	65(72-7)	35(61-26)	39(33+6)	72(68+4)		
	Malaysia	0.39		62(58+4)	45(54-9)	42(45-3)	72(72+0)	75(61+14)	26(33-7)		63(66-3)	100(84+16)
	Nepal		36(71-35)		31(54-23)	28(45-17)	40(72-32)	62(61+1)		40(68-28)	43(66-23)	61(84-23)
	New Zealand	0.7					70(72-2)		38(33+5)	80(68+12)		
	Pakistan	2.73			52(54-2)	38(45-7)	74(72+2)	65(61+4)			75(66+9)	91(84+7)
	Philippines	4.3			40(54-14)	37(45-8)	78(72+6)	72(61+11)	26(33-7)		47(66-19)	90(84+6)
	Singapore	1.11	69(71-2)	52(58-6)	42(54-12)	31(45-14)	58(72-14)	72(61+11)	20(33-13)	57(68-11)	38(66-28)	70(84-14)
	Thailand	1.83				45(45+0)	65(72-7)		36(33-3)	73(68+5)	67(66+1)	83(84-1)
Europe(0.45)	Austria	1.11					65(72-7)	79(61+18)	38(33+5)	75(68+7)	75(66+9)	94(84+10)
	Belgium			62(58+4)	57(54+3)	43(45-2)	83(72+11)		31(33-2)	72(68+4)	76(66+10)	95(84+11)
	Bulgaria		54(71-17)		59(54+5)	59(45+14)	89(72+17)		30(33-3)	56(68-12)	67(66+1)	73(84-11)
	Czech Republic		83(71+12)	49(58-9)	68(54+14)	63(45+18)	89(72+17)	24(61-37)		59(68-9)	64(66-2)	70(84-14)

Group	Country	AR	71	58	54	45	72	61	33	68	66	84
	Denmark			62(58+4)	67(54+13)	53(45+8)	89(72+17)	84(61+23)	45(33+12)	73(68+5)	87(66+21)	100(84+16)
	Finland	0		75(58+17)	64(54+10)	38(45-7)	89(72+17)	70(61+9)	32(33-1)	68(68+0)	85(66+19)	98(84+14)
	France	1.13	73(71+2)	63(58+5)	41(54-13)		88(72+16)	81(61+20)	46(33+13)	76(68+8)	89(66+23)	95(84+11)
	Germany	0.35	87(71+16)	61(58+3)	53(54-1)	36(45-9)	83(72+11)	75(61+14)	30(33-3)	66(68-2)	87(66+21)	92(84+8)
	Greece	0.68	61(71-10)	57(58-1)	46(54-8)	39(45-6)	67(72-5)	70(61+9)	40(33+7)	67(68-1)	75(66+9)	89(84+5)
	Hungary	0	85(71+14)	67(58+9)	56(54+2)	66(45+21)	89(72+17)	17(61-44)	28(33-5)		62(66-4)	82(84-2)
	Ireland	0	92(71+21)	57(58-1)	50(54-4)	45(45+0)	84(72+12)		38(33+5)	77(68+9)	63(66+3)	93(84+9)
	Italy	0.34		66(58+8)	52(54-2)	32(45-13)		75(61+14)	31(33-2)	72(68+4)	77(66+11)	88(84+4)
	Netherlands	1.33	90(71+19)	61(58+3)	65(54+11)	43(45-2)	91(72+19)	83(61+22)	33(33+0)	75(68+7)	81(66+15)	92(84+8)
	Norway	0			54(54+0)		80(72+8)	77(61+16)	43(33+10)	86(68+18)	87(66+21)	97(84+13)
	Poland		74(71+3)	43(58-15)	59(54+5)	60(45+15)	76(72+4)	71(61+10)	38(33+5)	66(68-2)	74(66+8)	77(84-7)
	Portugal	0			44(54-10)	55(45+10)	73(72+1)		44(33+11)	62(68-6)	68(66+2)	98(84+14)
	Romania		88(71+17)	68(58+10)	81(54+27)	64(45+19)			68(33+35)	70(68+2)	48(66-18)	66(84-18)
	Russia	0	44(71-27)	47(58-11)	60(54+6)	69(45+24)	86(72+14)	22(61-39)	28(33-5)	49(68-19)	53(66-13)	80(84-4)
	Serbia			24(58-34)		46(45+1)		11(61-50)			47(66-19)	84(84+0)
	Spain	0.61	75(71+4)	54(58-4)	63(54+9)	46(45+1)	71(72-1)		50(33+17)	76(68+8)	71(66+5)	83(84-1)
	Sweden	0	92(71+21)	65(58-7)	60(54+6)	40(45-5)	91(72-19)	89(61+28)	21(33-12)	71(68+3)	73(66+7)	89(84+5)
	Switzerland	0.55	97(71+26)	71(58+13)	66(54+12)		90(72-18)	83(61+22)	30(33-3)	77(68+9)	92(66+26)	92(84+8)
	Turkey	2									62(66-4)	83(84-1)
	UK	0.35	91(71+20)	58(58+0)	61(54+7)	48(45+3)	88(72+16)	82(61+21)	36(33+3)	77(68+9)	78(66+12)	93(84+9)
North American (0.29)	Canada	0.2	93(71+22)	69(58+11)	71(54+17)	53(45+8)	87(72+15)	77(61+16)	42(33+9)	79(68+11)	95(66+29)	96(84+12)
	USA	0.3	93(71+93)	66(58+8)	69(54+15)	54(58-4)	82(72+10)	85(61+24)	32(33-1)	82(68+14)	83(66+17)	92(84+8)
Africa-Middle East(1.63)	Bahrain				44(54-10)		63(72-9)		9(33-24)			
	Burkina Faso						41(72-31)	72(61+11)			48(66-18)	88(84+4)
	Egypt	4.62			30(54-24)	44(54-10)	63(72-9)		9(33-24)	49(68-19)	32(66-34)	95(84+11)
	Ethiopia						66(72-6)	73(61+12)	28(33-5)	64(68-4)	81(66+15)	96(84+12)
	Israel	0			89(54+35)		75(72+3)		33(33+0)	88(68+20)		
	Kenya	0					53(72-19)			66(68-2)		
	Kuwait	0					47(72-25)	55(61-6)	18(33-15)	55(68-13)	47(66-19)	68(84+16)
	Nigeria	4.44	73(71+2)	60(58+2)	74(54+20)	61(45+16)	46(72-26)	55(61-6)	47(33+14)	69(68+1)	56(66-10)	90(84+6)
	Oman	0					78(72+6)		11(33-22)	53(68-15)	35(66-31)	78(84-6)
	Saudi Arabia	0.57					67(72-5)		33(33+0)	52(68-16)		
	South Africa	1.02									80(66+14)	100(84+16)
	UAE (United Arab Emirates)						76(72+4)	37(61-24)	32(33-1)	64(68-4)	57(66-9)	65(84-19)
South/Central America-Caribbean(2.56)	Argentina	0	70(71+1)			43(45-2)			36(33+3)	75(68+7)	73(66+7)	91(84+7)
	Brazil	2.3	79(71+8)		40(54-14)	33(45-12)	77(72+5)		39(33+6)	76(68+8)	74(66+8)	91(84+7)
	Cuba	25	65(71-6)			69(45+24)	67(72-5)		56(33+23)	72(68+4)		
	Curacao							70(61+9)			81(66+15)	93(84+9)
	Mexico	1.55	64(71-7)	59(58+1)	32(54-22)	40(45-5)	70(72-2)		34(33+1)		80(66+14)	88(84+4)
	Uruguay						85(72+13)			88(68+20)	80(66+14)	55(84-29)
	Venezuela		32(71-39)		53(54-1)	27(45-18)	51(72-21)			33(68-35)	41(66-25)	44(84-40)

(AR: Accident Rates)

Table 2 Correlation between 14 countries and 10 questions

Vars	R-Sq	R-Sq (adj)	C-p	s	Q4.1	Q4.2	Q5.1	Q5.3	Q7.3	Q7.6	Q10.1	Q10.2	Q11.2	Q11.4
1	63.6	60.6	19.4	0.89087					✓					
2	74.1	69.4	12.9	0.78463			✓		✓					
3	87.1	83.2	4.5	0.58197					✓				✓	✓
4	94.5	92.0	0.5	0.40116		✓	✓	✓	✓					
5	95.7	93.0	1.5	0.37662		✓	✓	✓	✓					✓
6	95.6	92.4	3.3	0.39229		✓	✓	✓	✓	✓				✓
7	96.2	91.7	5.1	0.40883		✓	✓	✓	✓	✓		✓		✓
8	96.2	90.1	7.1	0.44607		✓	✓	✓	✓	✓	✓	✓		✓
9	96.3	87.8	9.0	0.49485		✓	✓	✓	✓	✓	✓		✓	✓
10	96.3	83.9	11.0	0.56912	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Table 3 Correlation between 21 countries and each of 5 questions

Vars	R-Sq	R-Sq (adj)	C-p	s	Q4.2	Q5.1	Q5.3	Q7.3	Q11.4
1	60.2	58.2	1.6	0.86946				✓	
1	20.1	15.9	20.4	1.2327	✓				
1	8.1	3.2	26.1	1.3221			✓		
1	5.1	0.1	27.5	1.3437		✓			
1	0.9	0.0	29.4	1.3727					✓

Table 4 Correlation between 14 countries and 5 questions

Vars	R-Sq	R-Sq (adj)	C-p	s	Q4.2	Q5.1	Q5.3	Q7.3	Q11.4
1	60.2	58.2	1.6	0.86946				✓	
2	62.6	58.4	2.5	0.86652				✓	✓
3	64.9	58.7	3.4	0.86342	✓			✓	✓
4	66.9	58.7	4.5	0.86417	✓	✓		✓	✓
5	68.0	57.3	6.0	0.87804	✓	✓	✓	✓	✓