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Attitudes Towards Information Privacy

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Abstract

This paper presents the results of a cross-cultural study into attitudes towards information privacy. Based on an instrument developed and validated by Smith, Milburg and Burke (Smith et al., 1996), this study sets out to measure individual concerns regarding organisational use of information along four dimensions: collection, errors, unauthorised secondary use, and improper access. The survey was completed by 52 undergraduate and postgraduate students enrolled in an e-commerce security subject at the University of Queensland. Comparisons are drawn between the results of this study and an identical one carried out at the University of North Alabama. Whilst it is too early to draw conclusions about the impact of these attitudes on the success of e-commerce in general, the results should be of interest to those within universities seeking to expand the use of networking technologies for handling sensitive information such as enrolment and fee processing.

Keywords

IS Security, Information Policy, Managing IS

INTRODUCTION

The "information age" and the expansion of telecommunications capabilities, have made it easy for firms to gather and store vast amounts of consumer data. Whilst this can lead to competitive advantage for the firms concerned it heightens concerns over information privacy for the individual. This study aims to explore the level of concern regarding information privacy issues and to identify factors associated with possible differences in those attitudes. The study is based on an instrument that has already been used at the University of North Alabama (UNA) (Alexander, 1998). The Instrument was originally developed and validated by Smith, Milberg and Burke (Smith et al., 1996) (1996). It was also used in an earlier study by the same authors (Milberg et al., 1995).

The paper is organised as follows. In the following section the theoretical framework of the study is laid down. Next, research process is described. In the penultimate section the key findings are presented and compared with findings in the two earlier studies that used the same instrument. Finally the contributions of the study and suggestions for further work are explored.

INFORMATION PRIVACY

Legal background

In the past ten years there has been increasing global interest in privacy. Media attention has focussed people's attention on information privacy and their right to it (Henderson, 1999). There are two broad means by which personal information privacy can be achieved; company self regulation, and government legislation. An appropriate level of privacy protection is essential for successful E-commerce (Forder and Quirk, 2001). The European Union and the United States lie at two ends of the spectrum regarding their approaches. In the US the Clinton administration saw privacy concerns as a threat to the development of e-commerce. It considered that private industry working in cooperation with consumer groups was preferable to government regulation (Culnan, 2000). Europe has taken a much more hands on approach with the passing of the EU directive on privacy that came into effect in 1998 (EU, 1998). This directive established minimum standards for processing and use of personal data. In Australia the Privacy act of 1988 applied only to federal government agencies. There was a long period in which state and federal governments have been uncertain whether to introduce legislation that applies to the public and private sectors. This uncertainty was resolved in 1999 when the privacy amendment act (private sector) was proposed. This will come into force in December 2001 (Australian Privacy Commissioner, 2000). Given that e-commerce has to occur in a global environment, these differing approaches seem likely to cause some conflict, or at least hinder the smooth running of commercial operations. It is imperative that there is coorperation between citizens, merchants and governments of different nations. A full

examination of the legal implications of assuring privacy is beyond the scope of this paper. It is the role of *citizens* in this three-way cooperation that is of interest here.

The main aim is to take a closer look at individuals privacy concerns, and to contribute to the body of research that informs regulation, both self and governmental. A key feature of the study is the use of a validated instrument, which makes the results readily comparable to past and future studies.

Like the previous study mentioned, (Alexander, 1998), this study uses students as its subject. Whilst the results of this study may not necessarily be generalised to the population as a whole, they are likely, at the least, to be of interest to system developers and policy makers within the university setting. Records maintained by universities are, by their nature and by law, private. However universities are increasingly expected to provide access to information through networking technologies these include systems for managing enrolment, grades and payment of fees. For example at the University of Queensland a recent initiative has been the introduction of the SI-Net (Student Systems Group, 2001). Initiatives such as these heighten the need for vigilance regarding the security of these records.

The role of social and demographic factors

Researchers in this area have identified a number of factors influencing individuals attitudes to information privacy. In particular frequency of use has been associated with lower levels of concern about privacy issues, and less experience with higher levels of anxiety (reported in (Alexander, 1998)). Researchers have also explored the effects of gender, age and personality type on attitudes to information privacy (Vance, 2000). Of interest in Australia was the Roy Morgan Poll which found that younger Australians (14-24) were least fearful, and women were more inclined to be worried about privacy issues (Morgan, 1999). Culnan (1993) (Culnan, 1993) made a particular study of secondary information use which she defined as

"the use of personal information for other purposes subsequent to the original transaction between an individual and an organization when the information was collected" (Culnan, 1993) P342.

The key finding of this study was that concern over secondary use was correlated with the level of control the individual has over the secondary use. This type of control is exemplified by American Express which agreed to inform its customers that it tracked their buying habits and used the data to compile mailing lists, which it sold to other companies. American Express further agreed to notify card holders of their ability to "opt out" of such lists (Crenshaw, 1992) in (Culnan, 1993) P342 .

Milberg et al (Milberg et al., 1995) 1995 investigated cultural influences on attitudes to privacy amongst members of the Information Systems Audit and Control Associations in a number of countries. One of their key findings was that lower levels of privacy concern were associated with countries with no privacy regulation and in countries which have the highest level of government involvement in corporate privacy management. This is a complex relationship indicating that where there is little awareness there is little concern and increasing levels of concern result in increasing legislation to the point where concern again drops off. In order to classify the level of government involvement in corporate privacy management they developed the scale illustrated in Figure 1. Australia was placed in the middle of the scale under Data Commissioner, and the US was placed lower down the scale under Voluntary control.

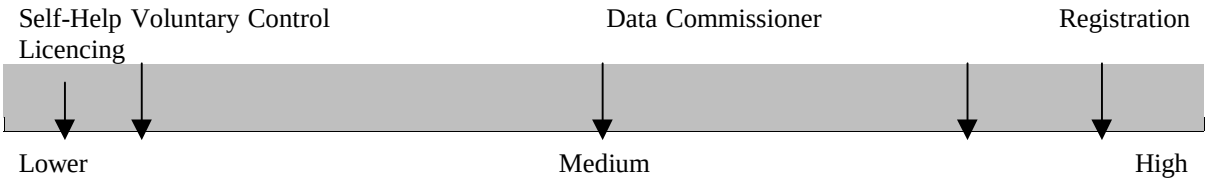

Figure 1: Level of Government Involvement in Corporate Privacy Management (Milberg et al., 1995) p66

With the exception of the last example, which used an earlier version of the Smith Milberg and Burke instrument, the studies mentioned above are hard to compare because they all used different instruments and reviewed different dimensions. The following section explains how some of the factors identified in earlier studies were tested, and how comparisons were made with studies using the same instrument.

RESEARCH METHOD

The survey was made available to the 100 students of a postgraduate subject "Securing the Commercial Internet" and the 70 students in the undergraduate subject of the same name. There were 35 valid responses in the postgraduate subject giving a response rate of 35% and 15 in the undergraduate subject giving a response rate of 21% and an overall response rate of 29%. There were 20 women in the survey and 29 men and one

person did not state their gender In the sample there were 26 students who identified themselves as being of Asian origin, 13 who identified themselves as European/Australian and 10 who did not state their race/ethnicity. The survey was delivered via WebCT which has built in survey software that ensures the responses are anonymous. Ethical approval was granted and students were given and overview of the project and assured that their participation in no way related to the marks for the course, and that they could withdraw at any time. Following this a consent form was signed.

The survey is based on a parsimonious 15 question instrument developed by Smith Milberg and Burke (Smith et al., 1996) (See Figure 3). In addition questions were asked about demographics and other background factors described in the previous section and often associated with attitudes to privacy. The supplementary questions selected here, followed those of Alexander (Alexander, 1998) who carried out a comparable university based study and related to skill level, and work environment. The questionnaire measures participants' attitudes along four dimensions, which are briefly described here and illustrated in figure 1. For a full explanation of the dimensions the reader is referred to (Smith et al., 1996).

Collection:

These questions deal with concerns about the volume of data being collected and the reasons for its collection,

Errors:

These questions examine participants attitudes towards errors, both accidental and maliciously planted, and the steps companies are taking to avoid them

Improper access:

The questions on improper access probe participants attitudes to who has access to their information within the organisation that collects and stores it.

Secondary use:

These questions relate to the common practice of using data for purposes other than those for which it was collected. E.g collecting it for research and using it for marketing, or collecting data in the course of normal credit card transactions and using it for marketing.

The analysis was conducted in two parts. First, comparisons were made between the results of this study, and two previous studies that used the same instrument. Second with reference to the literature review above, six factors were identified which have been shown to have an effect on attitudes to privacy. These are illustrated in Figure 2 and the relevant research propositions are numerated below. These factors were tested using one-way ANOVA.

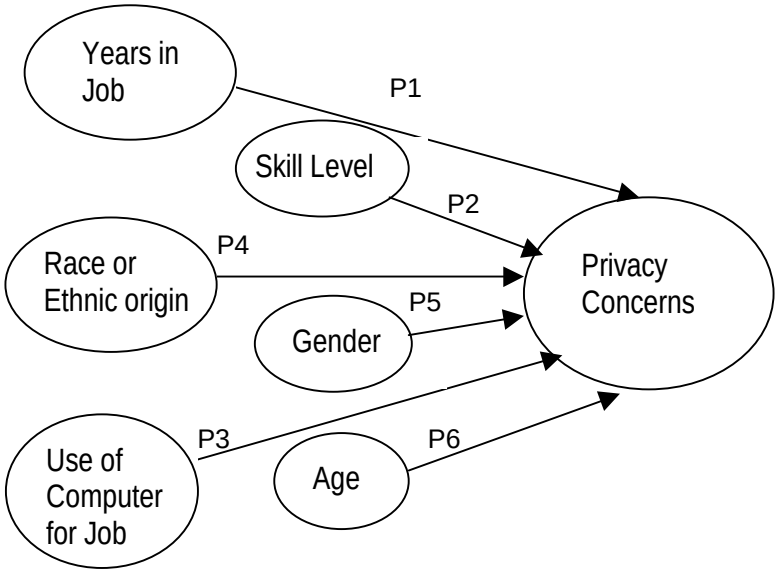

Figure 2: Factors proposed to be associated with privacy concerns

Research propositions:

P1 More years at work is negatively associated with high levels of privacy concern, (Vance, 2000) (Alexander, 1998)

P2 Self-reported skill level will be negatively associated high levels of privacy concern, (Alexander, 1998)

P3 Use of a computer at work will be negatively associated with high levels of privacy concern, (Vance, 2000) (Alexander, 1998)

P4 Race or ethnic origin significantly affects levels of privacy concern, (Milberg et al., 1995) (Whitman et al., 1999)

P5 Gender significantly affects levels of privacy concern, (Morgan, 1999)

P6 Age is negatively associated with high levels of privacy concern. (Morgan, 1999)

Table 1. Final Instrument

Here are some statements about *personal information*. From the standpoint of personal privacy, please indicate the extent to which you, *as an individual*, **agree** or **disagree** with each statement by circling the appropriate number.*

A. It usually bothers me when companies ask me for personal information.
B. All the personal information in computer databases should be double-checked for accuracy—no matter how much this costs.
C. Companies should not use personal information for any purpose unless it has been authorized by the individuals who provided the information.
D. Companies should devote more time and effort to preventing unauthorized access to personal information.
E. When companies ask me for personal information, I sometimes think twice before providing it.
F. Companies should take more steps to make sure that the personal information in their files is accurate.
G. When people give personal information to a company for some reason, the company should never use the information for any other reason.
H. Companies should have better procedures to correct errors in personal information.
I. Computer databases that contain personal information should be protected from unauthorized access—no matter how much it costs.
J. It bothers me to give personal information to so many companies.
K. Companies should never sell the personal information in their computer databases to other companies.
L. Companies should devote more time and effort to verifying the accuracy of the personal information in their databases.
M. Companies should never share personal information with other companies unless it has been authorized by the individuals who provided the information.
N. Companies should take more steps to make sure that unauthorized people cannot access personal information in their computers.
O. I'm concerned that companies are collecting too much personal information about me.

Items A, E, J, and O comprise the "Collection" subscale; items B, F, H, and L comprise the "Errors" subscale; items C, G, K, and M comprise the "Unauthorized Secondary Use" subscale; and items D, I, and N comprise the "Improper Access" subscale. Subscale scores are calculated by averaging the responses to the items for each subscale; an overall score is then calculated by averaging the subscale scores.

Figure 3: Survey questions (Smith et al., 1996) p170

FINDINGS

The findings of this study will be addressed as under three headings, first in comparison to the Alabama study, second with the 1995 Milberg study and finally in terms of testing the research propositions identified.

Comparison with Alabama study

	Undergraduate UQ N=15		Postgraduate UQ N=34		Overall UQ N=49		Overall UNA N=124	
	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation
ERROR	5.97	0.70	5.58	0.91	5.70	0.86	5.51	1.15
SECOND	6.52	0.59	6.19	0.71	6.29	0.69	6.1	1.24
IMPROPER	6.36	0.84	6.19	0.78	6.24	0.79	6.03	1.25
COLLECT	5.50	1.18	5.56	0.81	5.55	0.92	4.59	1.3
OVERALL	6.08	0.55	5.88	0.62	5.94	0.60	5.56	0.99

Table 1: Comparison with Alabama study (Alexander, 1998)

Table 1 shows the attitudes of students in this survey as compared to business students at the university of Alabama. University of Queensland students illustrate higher levels of concern in all dimensions.

It will be noted that American students are generally less concerned about privacy which fits with the Milberg study described earlier (Milberg et al., 1995). In addition postgraduate students appear to be less concerned about privacy than undergraduate students on all dimensions except collection. This is illustrated in Figure 4.

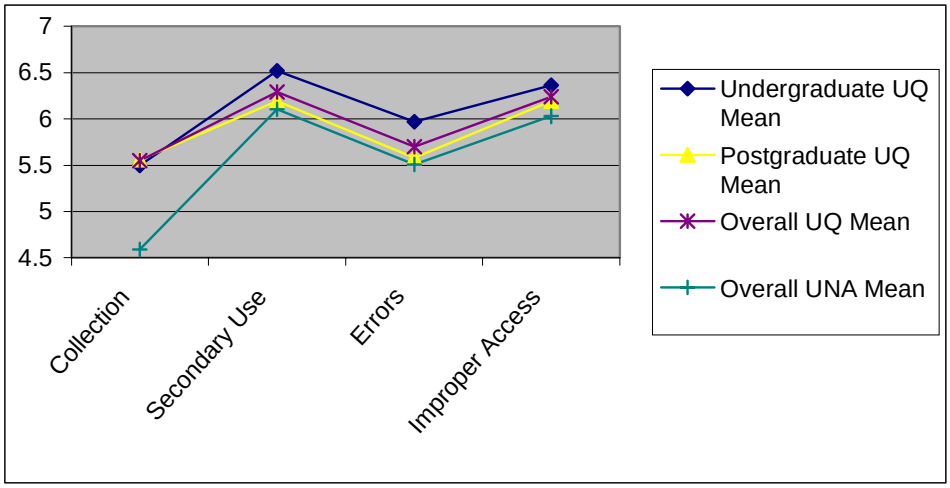

Figure 4: Privacy concerns among business student at UNA and E-commerce Students at UQ

In comparison to the Milberg study (1995): Privacy, values and regulatory approaches

	Collection	Secondary Use	Errors	Improper Access
Thailand	4.7(4)	5.8(2)	5.2(3)	6(1)
France	5(4)	6.6(1)	5.5(3)	6.2(2)
Japan	4.9(4)	6.3(2)	5.6(3)	6.5(1)
United States	5.4(4)	6.1(1)	5.5(3)	5.9(2)
United States (UNA)	4.59(4)	6.10(1)	5.51(3)	6.03(2)
Australia	5.6(3)	6.6(1)	5.3(4)	5.8(2)
Australia (UQ)	5.55(4)	6.29(1)	5.7(3)	6.24(2)
Canada	5.7(4)	6.4(1)	5.6(3)	6.1(2)
New Zealand	5.3(3)	6.4(1)	5.2(4)	5.9(2)
Denmark	4.8(4)	6.2(1)	5.5(3)	6.1(2)
United Kingdom	5.2(4)	6(1)	5.6(3)	5.8(2)

Table 2: Level of information privacy concern by dimension in countries (adapted from (Milberg et al., 1995))

First number represents the mean on a scale of 1-7 the second number represents the dimensions rank in a given country.

The original table in (Milberg et al., 1995) , on which Table 2 is based, served to support the hypothesis in that levels of concern are lower at each end of the governmental regulatory scale illustrated in Figure 1 and higher in the middle. In this adapted table, countries are listed top-down in the order of government involvement Australia, Canada and New Zealand find themselves in the middle ground. The University of Queensland students go against their national trend in terms of how the concerns are ranked. American students, as expected, appear to be less concerned about privacy than Australian students. It is hard to judge the significance of this without further study of the make up of these student groups, as we will see the UQ group was far from homogenous. The highlighted part of the table is illustrated graphically in Figure 5.

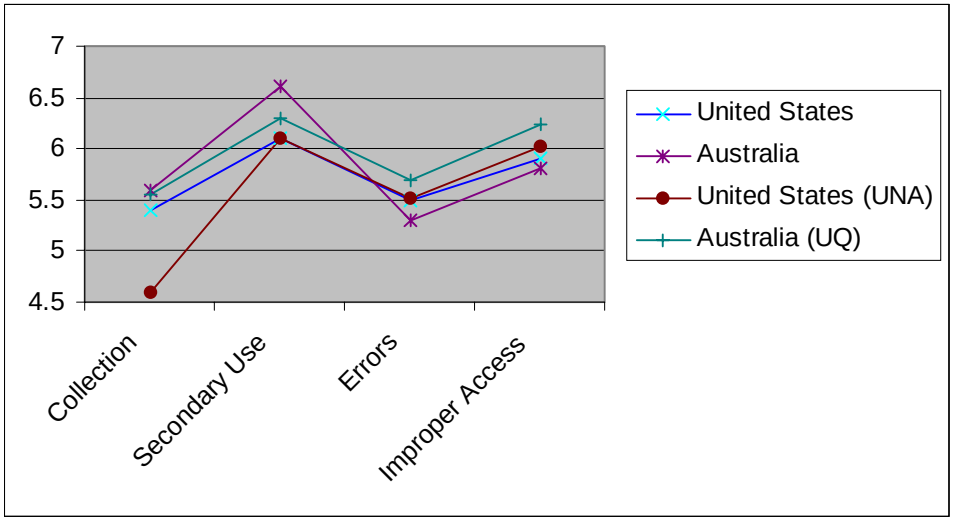

Figure 5 Australian and US attitudes to privacy. Mainstream data taken from (Milberg et al., 1995). Student data taken from (Alexander, 1998) at the University of North Alabama and the current study.

Testing of research propositions

The six propositions identified were tested using analysis of variance (see Appendix). P1 was rejected, as in this sample more years at work was positively correlated with higher levels of concern. P2 was rejected. Those reporting a higher level of skill were not significantly less concerned about privacy. P3 was found to be true only in one dimension. - those who use a computer at work are more likely to be concerned about improper access. P4 was rejected, there was no relationship between race and privacy concerns. P5 was true in one dimension females in the study were more likely to be concerned about secondary usage. P6 was rejected there was no effect due to age.

DISCUSSION

The U.S. and Europe exhibit very different approaches to information privacy from both regulatory and managerial perspectives. It seems that these differences are grounded in different cultural values and assumptions about the meaning of privacy (a "human rights" issue in Europe versus a contractual issue in the U.S.). Australia falls between the two.

This study supports earlier work in that the students in this study exhibited levels of privacy concern appropriate to the cultural setting within which they find themselves ie Australia. A closer examination of the make up of the class brings into focus one of the limitations of the study. Two thirds of the sample are of Asian decent, and it is impossible to tell whether this will affect their attitudes since those who were brought up in Asia cannot be distinguished from those who are born or naturalized Australians. The crude division of Asian vs non-Asian is not reliable since the data was gathered with a free-text field and respondents entered a variety of answers. If we stick with this division two further findings emerge. Students of Asian origin are less concerned about privacy than those of non-Asian origin, and if the non-responders are left in the analysis race also becomes a significant determinant of attitude to the "Collection" dimension.

The two other key findings were that those who used a computer at work were more likely to be concerned about improper access - this probably reflects a high level of concern relating to a broader class of data than just

their own personal data, but the management of data in a work setting in general and its protection from hackers and other unauthorised access.

Women were found to be more concerned about secondary use, this finding would require further study to validate its relevance.

A further interesting and possibly confounding factor is that these students were at the start of a required course in security in e-commerce. This could have resulted in heightened awareness of privacy and security in general. One aim of this study was to provide the students with an opportunity to examine their own values and concerns in relation to privacy.

This study contributes to the body of knowledge in the area, it identifies information practices that have the potential cause public concern along predefined dimensions. Firms can use this information to self-regulate and develop and promulgate proactive privacy policies as opposed to fielding complaints in reactive mode. Further work will include a study directed at a wider base within Australia.

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APPENDIX 1

Secondary Usage Of Information

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
GENDER	Between Groups	4.118	9	.458	2.312	.034
	Within Groups	7.719	39	.198		
	Total	11.837	48			
AGE	Between Groups	183.809	9	20.423	.415	.919
	Within Groups	1820.617	37	49.206		
	Total	2004.426	46			
RACE2	Between Groups	5.299	9	.589	.901	.534
	Within Groups	25.477	39	.653		
	Total	30.776	48			
YEARSJOB	Between Groups	159.006	9	17.667	.859	.570
	Within Groups	657.970	32	20.562		
	Total	816.976	41			
COMPJOB	Between Groups	14.850	9	1.650	1.104	.384
	Within Groups	56.817	38	1.495		
	Total	71.667	47			
SkillLevel	Between Groups	4.472	9	.497	.670	.730
	Within Groups	28.916	39	.741		
	Total	33.388	48			

Collection

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
GENDER	Between Groups	4.245	14	.303	1.358	.227
	Within Groups	7.592	34	.223		
	Total	11.837	48			
AGE	Between Groups	465.242	14	33.232	.691	.766
	Within Groups	1539.183	32	48.099		
	Total	2004.426	46			
RACE2	Between Groups	2.769	14	.198	.805	.657
	Within Groups	5.898	24	.246		
	Total	8.667	38			
YEARSJOB	Between Groups	167.298	14	11.950	.497	.915
	Within Groups	649.679	27	24.062		
	Total	816.976	41			
COMPJOB	Between Groups	30.865	14	2.205	1.829	.075
	Within Groups	40.972	34	1.205		
	Total	71.837	48			
SkillLevel	Between Groups	10.104	14	.722	1.054	.429
	Within Groups	23.283	34	.685		
	Total	33.388	48			

Improper Access

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
GENDER	Between Groups	2.437	8	.305	1.296	.273
	Within Groups	9.400	40	.235		
	Total	11.837	48			
AGE	Between Groups	231.922	8	28.990	.622	.754
	Within Groups	1772.503	38	46.645		
	Total	2004.426	46			
RACE2	Between Groups	5.500	8	.687	1.088	.391
	Within Groups	25.276	40	.632		
	Total	30.776	48			
YEARSJOB	Between Groups	188.969	8	23.621	1.241	.307
	Within Groups	628.008	33	19.031		
	Total	816.976	41			
COMPJOB	Between Groups	23.500	8	2.938	2.378	.034
	Within Groups	48.167	39	1.235		
	Total	71.667	47			
SkillLevel	Between Groups	3.854	8	.482	.652	.729
	Within Groups	29.534	40	.738		
	Total	33.388	48			

Errors

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
GENDER	Between Groups	2.281	11	.207	.803	.636
	Within Groups	9.556	37	.258		
	Total	11.837	48			
AGE	Between Groups	312.292	11	28.390	.587	.826
	Within Groups	1692.133	35	48.347		
	Total	2004.426	46			
RACE2	Between Groups	9.687	11	.881	1.545	.157
	Within Groups	21.089	37	.570		
	Total	30.776	48			
YEARSJOB	Between Groups	102.971	11	9.361	.393	.948
	Within Groups	714.006	30	23.800		
	Total	816.976	41			
COMPJOB	Between Groups	19.394	11	1.763	1.214	.313
	Within Groups	52.272	36	1.452		
	Total	71.667	47			
SkillLevel	Between Groups	10.499	11	.954	1.543	.158
	Within Groups	22.889	37	.619		
	Total	33.388	48			

Overall

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
GENDER	Between Groups	7.803	35	.223	.719	.788
	Within Groups	4.033	13	.310		
	Total	11.837	48			
AGE	Between Groups	1418.792	35	40.537	.761	.742
	Within Groups	585.633	11	53.239		
	Total	2004.426	46			
RACE2	Between Groups	22.409	35	.640	.995	.533
	Within Groups	8.367	13	.644		
	Total	30.776	48			
YEARSJOB	Between Groups	785.051	35	22.430	4.216	.039
	Within Groups	31.925	6	5.321		
	Total	816.976	41			
COMPJOB	Between Groups	55.700	35	1.591	1.196	.386
	Within Groups	15.967	12	1.331		
	Total	71.667	47			
SkillLevel	Between Groups	21.921	35	.626	.710	.795
	Within Groups	11.467	13	.882		
	Total	33.388	48			

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