

The Effects of the Ability to Choose the Type of Human Resources System on Perceptions of Invasion of Privacy and System Satisfaction

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Abstract Using data from employed participants in two separate studies, we examined the effects of (a) the ability to choose the type of human resource system, and (b) the type of information disclosed on perceptions of invasion of privacy and satisfaction with the human resource system. Results of both studies revealed that individuals were more satisfied with human resource services and less likely to perceive that the disclosure of data was invasive of privacy when (a) they had the ability to choose the type of system through which data were disclosed, and (b) the information disclosed was non-medical as opposed to medical in nature. The results have important implications for safeguarding employee privacy, developing privacy policies in organizations, and enhancing employee satisfaction with human resource services. Implications for theory, research, and practice are discussed.

Keywords Human resource technology · Privacy · Satisfaction · System choice

Introduction

In an effort to increase the efficiency and effectiveness of human resource (HR) practices, organizations are transitioning from traditional, paper-based systems (also referred to as traditional HR systems or THRSSs) to systems that are

web-based HR information system (also referred to as web-based systems or WBHRISs). These WBHRISs are used for collecting, storing and retrieving data about employees in a web-based environment (Gueutal and Stone 2005).

There are several reasons for the move to WBHRISs. First, several analysts have argued that they allow HR managers to engage more freely in HR planning and contribute to the overall business-related goals of a firm (Dulebohn and Marler 2005; Gueutal and Stone 2005; Walker 1993). Second, some have argued that WBHRISs have helped HR departments provide better service to nonmanagerial and managerial employees by enabling them to streamline such HR functions as recruitment, selection, performance management, compensation, and benefits administration (Cardy and Miller 2003; Dulebohn 2003; Gueutal 2003; Stone et al. 2003).

Self-service Web-based Systems

A growing number of WBHRISs involve self-service applications that (a) allow employees to update their records and enroll in benefit programs, and (b) provide managers with reports and a variety of decision-support tools aimed at improving decision-making and insuring compliance with government regulations (Marler and Dulebohn 2005; Gueutal and Falbe 2005). The overall objectives of WBHRISs include enhancing the functionality of HR departments, providing cost savings to the company, and enabling employees to take ownership of their personal information (Gueutal and Falbe 2005).

Dysfunctional Consequences of Web-based Systems

Despite the many benefits and increased use of WBHRISs, there are growing concerns about the extent to which they

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have the potential to violate employees' actual or perceived rights to privacy (Stone and Stone 1990; Stone and Stone-Romero 1998). In addition, there are concerns that such systems may decrease employee satisfaction with the services provided by HR departments (Bloom 2001; Gutek 1995; Stone et al. 2003). Given these arguments, we believe that individuals may be less likely to accept WBHRISs when they perceive these systems invade privacy or reduce the level of HR service provided. As a result, WBHRISs are likely to be less effective if individuals do not accept or use the new systems. Survey research has shown that employee acceptance of WBHRISs is a key factor affecting the successful implementation of such systems (Cedarcrestone 2006; Stone et al. 2003). In view of these arguments, we conducted two experimental studies focusing on factors thought to affect individuals' reactions to HR systems.

Study 1

The primary purpose of Study 1 was to assess the impact of two factors associated with a HR system (i.e., type of information disclosed, and the ability to choose the type of system) on two important outcomes, i.e., invasion of privacy and HR service satisfaction. The HR systems included in this study were a paper-based file system (THRS) or a web-based HR information system (WBHRIS). In the paragraphs that follow, we consider literature related to these outcomes. We then review literature relevant to the study's independent variables and present hypotheses associated with the same variables.

Privacy in Organizational Contexts

Privacy is typically viewed in terms of an individual's (a) values regarding control over personal information, (b) beliefs about their ability to control information, and (c) views about the consequences that will result from releases of the information (Stone 1981; Stone and Stone 1990). The information control perspective is important because employees often release large amounts of information about themselves (e.g. marital status, training and experience, names of dependents, health data) to employers in exchange for employment and employment-related benefits. In addition, when disclosing the information, they do so with several privacy-related expectations in mind, among them being that (a) the data will be treated confidentially, and (b) employers will only use information for legitimate, job-related purposes and will prevent improper uses of it (Lederer 1992; Stone and Stone 1990; Stone and Stone-Romero 1998).

Research on Privacy

Research on privacy shows that employers often believe they have not only a need to collect personal data about employees to make employment-related decisions, but that they also have a right to determine how such data will be collected, stored, used, or released to third parties (Lederer 1992; Linowes 1996; Privacy Protection Study Commission 1977; Stone and Stone 1990; Stone and Stone-Romero 1998). However, the practices and methods that organizations use to protect the privacy of their employees vary considerably (Linowes 1989, 1996; Piller 1993; SHRM and West Group 2000; Smith 1993). For example, research by the Society of Human Resources Management (SHRM) and West Group (2000) found that only 34% of the approximately 700 companies surveyed had formal written policies regarding the collection of medical information from employees, and 60% did not inform employees about disclosures of their data. In addition, a survey of Fortune 500 companies (Linowes 1996) found that 72% of firms did not allow employees to access their records, 24% did not permit corrections, 38% did not inform employees about data stored in them, and 42% did not have established privacy policies.

The Stigmatization of Individuals

Given the increased use of WBHRISs and the lack of privacy policies in many organizations, Linowes (1989) and others (e.g., Stone and Stone 1990) warned that the proliferation of databases and computer networks gives employers access to data that may unfairly stigmatize employees, and negatively affect organizational decisions (e.g., promotion, layoff) about them. For example, the use of WBHRISs may give managers access to employee medical data, employee assistance claims, and background data that may have little or no bearing on job performance. In addition, the use of WBHRISs may create permanent marks or stigmas that employees cannot overcome easily (Stone and Stone-Romero 1998). Despite the use of firewalls and other security systems, medical data used for hiring or insurance purposes may be accessed by individuals who do not have "a need to know" and it may affect career decisions about individuals (Wolfe, personal communication, October 12, 2005). Moreover, employers who ignore privacy issues may pay a price in terms of employee resentment, dissatisfaction, low productivity, turnover, and even sabotage (Stone and Stone 1990; Stone & Stone-Romero 1998).

Fair Information Policies

Over 20 years ago, the Privacy Protection Study Commission (1977) argued that technological advances require

that organizations balance their needs for information against employees' expectations of and/or rights to privacy. Moreover, it recommended that when employers develop or implement a computerized HR information system they also should develop fair information policies regarding employee records.

The need for privacy policies is also evidenced by the results of a survey by Pew Internet and American Life showing that Americans are increasingly concerned about placing their information in web-based systems (Kornblum 2001). Kornblum (2001) argued that in the US, the use of technology in HR systems, including WBHRISs, has increased at a much more rapid pace than the formulation of policies on access to employee data. This is important because even though the Privacy Act of 1974 controls the access and release of employee data in the public sector, at present there is no federal legislation concerned with the protection of privacy in the private sector. It merits noting, however, that the results of a recent survey indicate that 62% of the US respondents supported the need for privacy laws and the protection of privacy in the US (Kornblum 2001).

Despite the fact that there are no private sector privacy laws in the US, the European Community recently passed legislation (i.e., The European Union Directive on Data Privacy, 1998) restricting the flow of employee data across national boundaries. Thus, in response to concerns about privacy, there are already restrictions on the access or disclosure of employee data in multinational firms conducting business in Europe.

Satisfaction with Human Resource Services

The satisfaction of employees with the services provided by a HR department is a function of a number of factors, one of which is the means through which employees obtain such services. Of particular relevance to our research is the distinction between service relationships and service encounters. Gutek (1995) defines a service *relationship* as an ongoing series of transactions in which a particular service provider and particular customer (client) become known to each other and expect continued interaction in the future. In contrast, we define a computer system service *encounter* as an interaction between a client (e.g., an employee) and a computer system service provider (e.g., a WBHRIS) in which (a) the client has no direct, face-to-face communication with the service provider, (b) the client must respond to a series of computer-generated prompts in order to obtain needed services, and (c) the service provider does not allow the client to deviate from pre-programmed options or alternatives. As a result, computer system service providers (e.g., WBHRIS) offer clients virtually no flexibility in the way that services are provided.

In THRSs, there is a service relationship, and employees can contact HR professionals for help on such issues as choosing benefit plans and enrolling in them. However, with a WBHRIS, the traditional service relationship between an employee and a HR professional is replaced with a service encounter with an impersonal, computerized system. Overall, Gutek's theory and research suggests that the use of WBHRISs might decrease service satisfaction. More specifically, research by Gutek and her colleagues (Gutek 1995; Gutek et al. 1999, 2000) showed that customer satisfaction may suffer when automated encounters replace service-oriented relationships with people. However, contrary to Gutek's arguments, some researchers (Gueutal 2003; Cedar 2001) suggest that the use of WBHRISs may increase service satisfaction because employees can easily (a) control their HR transactions, and (b) complete such transactions as benefits enrollment and changes in retirement plans at their convenience.

In spite of the growing use of WBHRIS and concerns about their potential to invade privacy, only a handful of studies have examined the effects of information policies on this outcome (Eddy et al. 1999; Kallman and Smith 1995; Stone et al. 1998; Taylor and Davis 1989). In addition, there is virtually no research that deals with the impact of information policies and procedures on service satisfaction. Thus, a major purpose of Study 1 was to examine the effects of two factors that may affect invasiveness and service satisfaction: (a) system choice, i.e., the ability to choose the type of HR system (i.e., WBHRIS vs. THRS) used in disclosing information, and (b) information type, i.e., the type of information revealed to the HR system.

System Choice

The ability of employees to choose the type of system through which information is disclosed is likely to affect both invasion of privacy and service satisfaction. Organizations vary in the degree to which they give employees the ability to choose the type of HR system. In some cases companies implement new WBHRISs and require that employees use only the new systems (Cedar 2002). One consequence of this that individuals may perceive they will lose control over their personal information and fear their privacy will be invaded. However, other companies including Pepsi Bottling Group, Ball Corporation, Frensenius Medical Care of North America, and the States of Texas and Florida allow employees to choose between a WBHRIS and a THRS (International Human Resources Information Management Association, personal communication, August 12, 2004). As a result of their ability to choose between a WBHRIS and a THRS, individuals may perceive they have greater control over the disclosure of

personal information. Furthermore, they may be less likely to believe their privacy will be invaded, and should be more satisfied with the HR service provided. In view of these arguments, we consider the effects of the ability to choose the type of HR system on these outcomes below.

Effects on Invasion of Privacy

Models of privacy (Stone and Stone 1990) and research on privacy (Eddy et al. 1999; Kallman and Smith 1995; Taylor and Davis 1989) indicate that the greater the degree of control that employees have over the release of their personal information, the lesser the degree to which they will perceive that their privacy has been invaded. Furthermore, research on privacy has shown that giving employees a choice about how their data are disclosed gives them a sense of control over information, and decreases perceptions of invasiveness (Fusilier and Hoyer 1980; Tolchinsky et al. 1981).

Also, with regard to invasiveness, employees may believe that they are less likely to be stigmatized when providing sensitive information to a HR professional for a THRS than when submitting it to a WBHRIS. The reason for this is that employees may believe that HR professionals are less likely to reveal personal information to third parties than is a networked WBHRIS. Therefore, employees may prefer to disclose sensitive data (e.g., information about illnesses) to a HR professional than to a WBHRIS.

Note, moreover, that research on reactance (Brehm 1966) suggests that when organizations change from a THRS to a WBHRIS without giving employees options, they will react negatively if they believe that the switch serves to reduce their personal freedom or control. In addition, if they believe that control over information is vital to protecting their privacy (e.g., prevent them from experiencing embarrassment or stigmatization) they may also perceive a WBHRIS to be more invasive than a THRS.

In view of the above, in Study 1 we tested the following hypothesis:

Hypothesis 1 Individuals will be less likely to perceive their privacy has been invaded when they have the ability to choose the type of HR system (i.e., THRS versus WBHRIS) for disclosing data than when they lack this ability (i.e., they must use a WBHRIS).

Effects on Service Satisfaction

Although many companies are implementing WBHRISs, it is unclear that they actually promote service satisfaction. For example, in some cases the use of technology may increase service satisfaction because employees can

quickly update their records or benefits at any time of the day or night (Gueutal 2003). However, in other situations, service satisfaction may decrease because WBHRISs may prevent employees from getting assistance from HR professionals on such important issues as medical benefits or retirement benefit (Bloom 2001; Stone et al. 2003). In addition, employees may perceive that WBHRISs are inflexible and fail to provide the types of services that are typically provided by HR professionals (Gutek 1995; Stone et al. 2003). Moreover, some employees may lack the skills or computer hardware needed to use WBHRISs. For example, recent research suggests that older workers, women, and some minorities (e.g., African-Americans, Hispanic-Americans) may have more difficulty using computer systems than others (McManus and Ferguson 2003; Johnson et al. 2005). Therefore, the use of WBHRISs may decrease service satisfaction.

A recent survey (Cedar 2002) revealed that about 46% of 299 companies surveyed use WBHRISs. The same companies argue that such systems not only reduce costs, but also improve service to employees. However, when implementing these systems, most organizations just switch to the new WBHRIS, without giving employees the option of choosing the type of HR system they want to use (International Human Resources Information Management Association, personal communication, August 12, 2004). As a result, the use of only self-service WBHRISs may reduce service satisfaction.

In terms of the service satisfaction criterion, employees may prefer a relationship-based meeting with an expert HR professional to an encounter with a WBHRIS. However, they may want to use a WBHRIS when a transaction is fairly routine and does not involve the disclosure of sensitive information (e.g., change of address or telephone number). In these cases, employees may prefer the use of a WBHRIS over a THRS in order to avoid delays caused by having to schedule and attend one or more meetings with a HR professional. In short, providing employees with a *choice* of HR system may increase service satisfaction.

Although the switch from THRSs to WBHRISs may have important consequences for service satisfaction, no research has been conducted on this issue. Thus, a major purpose of Study 1 was to assess how service satisfaction is affected by employee discretion over the type of HR system used in collecting data about them. To do so, we tested the following hypothesis in Study 1:

Hypothesis 2 Service satisfaction will be greater when individuals have the ability to choose the type of HR system for disclosing data (THRS or WBHRIS) than when they do not have this ability (i.e., they must use a WBHRIS).

Type of Information Disclosed

Effects on Invasion of Privacy

As noted previously, privacy theorists argue that the type of information disclosed is an important determinant of invasiveness (Stone and Stone 1990; Stone-Romero et al. 2003). Furthermore, research suggests that some types of employee information are more sensitive than others (e.g., financial data, medical data, family background data) because the same information has a greater potential to stigmatize individuals in the employment process than other types of information (Rosenbaum 1973; Stone and Stone 1990; Stone-Romero et al. 2003). It is also clear that disclosing some types of data leads to greater perceptions of invasiveness than others (Stone and Stone 1990; Stone-Romero et al. 2003). For example, research by Kallman and Smith (1995) showed that medical, salary, and performance data are the most sensitive types of data stored in a computerized HR information system. In addition, research has shown that individuals are more concerned about controlling information about finances (e.g. salary), family background, personality, arrests and convictions, sexual orientation, and lifestyle (e.g., same sex domestic partners) than information about employment history, educational background or references (Harris and Westin 1979; Rosenbaum 1973; Simmons 1968; Stone and Stone 1990; Tolchinsky et al. 1981). Moreover, research by Stone-Romero et al. (2003) showed that the type of information revealed by various personnel selection procedures influences invasiveness. For example, invasiveness was greater for procedures involving medical data than for procedures concerned with data about physical abilities.

The differential invasiveness of different types of information is important because a HR system often includes data about such factors as training, experience, job performance, salary, benefits, racial and ethnic background, health, accidents, and emergency contacts. Moreover, despite the use of security devices in WBHRISs there is frequently the ability to link records of a non-medical nature with records that are medically related (e.g., information about health insurance coverage, chronic illnesses). Thus, employees may perceive that such systems have a greater potential to reveal sensitive data to others than do THRSs. As a consequence, they may be more reluctant to use WBHRISs than THRSs for various purposes (e.g., to enroll in benefits or health insurance coverage). The primary reason for this is that employees may believe that when medical data are stored in a WBHRIS, they may be more likely to suffer embarrassment or loss of privacy than when such data are stored in a THRS. Therefore, they may also be less

satisfied with a HR system when medical (as opposed to non-medical) data are stored in such a system. However, only one previous study (Kallman and Smith 1995) has examined the extent to which the type of data stored in a computerized HR information system influences invasiveness. In view of the paucity of research on this issue, another purpose of Study 1 was to test the following hypothesis:

Hypothesis 3 Individuals will be more likely to perceive that their privacy has been invaded when medical data are disclosed to a HR system than when non-medical data are disclosed.

Effects on Service Satisfaction

To the degree that individuals feel that disclosing information to a HR system is invasive, they also will be likely to express dissatisfaction with the HR system and the services of a firm's HRs department. And because the disclosure of medical data will be viewed as more invasive of privacy than the disclosure of non-medical data, service satisfaction will be lower when medical data are disclosed than when non-medical data are disclosed. Thus, Study 1 also tested the following hypothesis:

Hypothesis 4 Service satisfaction will be greater when non-medical data are disclosed to a HR system than when medical data are disclosed.

Relation Between Invasiveness and Service Satisfaction

Because invasion of privacy entails the loss of control over information, both reactance theory (Brehm 1966) and models of privacy (Stone and Stone 1990) suggest that the same loss will reduce service satisfaction. However, no research has specifically examined the relation between invasiveness and service satisfaction. This is unfortunate because one of the major goals of many HR systems is to increase service satisfaction.

In view of the fact that no previous research has considered the relation between invasiveness and service satisfaction, in Study 1 we tested the following hypothesis:

Hypothesis 5 Invasiveness will correlate negatively with service satisfaction.

Moreover, previous theory and research on privacy (e.g., Eddy et al. 1999; Stone and Stone 1990), is consistent with the proposition that system choice causes invasiveness, which in turn causes service satisfaction. Thus, we also tested the following hypothesis:

Hypothesis 6 The relation between system choice and service satisfaction will be mediated by invasiveness.

Method

Overview

Using a 2×2 experimental design, Study 1 examined the effects of (a) ability to choose the type of HR system to which data would be disclosed (choice vs. no choice), and (b) type of information disclosed (medical vs. non-medical) on invasiveness and service satisfaction.

Participants

Participants were 71 employed individuals from the Northeastern and Southeastern areas of the United States. The sample included 31 men and 40 women. Their average age was 28.73 years, and their ages ranged from 21 to 56. They had an average of 6.68 years of work experience. Sixty-three of the participants were White, 4 were African-American, 3 were Asian, and 1 was Hispanic-American. They were employed in a variety of positions, including manager, computer analyst, engineer, salesperson, consultant, administrative assistant, and teacher. Fifty-six had a bachelor's degree and 45 had completed some graduate-level coursework.

Procedures

Participants were (a) given a consent form specifying the purpose of the study and its procedures, (b) randomly assigned to one of four treatment conditions, (c) asked to assume the role of a new employee in a firm completing forms for a HR system and enrollment in benefit programs, (d) asked to read a set of policies used to govern the disclosure of data to the HR system, (e) asked to complete employment forms needed for the HR system and enrollment in the benefit programs, (f) asked to complete questionnaires designed to assess perceptions of invasion of privacy and satisfaction with the services provided by the HR department, (g) asked to complete questionnaires containing manipulation checks and demographic items, and (h) thanked for their participation and debriefed on the purpose and procedures used in the study.

Manipulations

As noted above, in order to manipulate the study's independent variables, participants were given and asked to assume the role of an employee who had just been hired by a firm. The organization was described and the scenarios indicated that the HR department required that they complete forms for record keeping, benefits enrollment, and emergencies. The scenario also specified that all data collected would be stored in the organization's HR system.

Ability to choose type of human resource information system. System choice was manipulated by varying information in the scenario. In the *choice* condition, participants were informed that they had the opportunity to choose the type of HR system involved in the disclosure of data, i.e., they could either (a) meet with a HR professional or (b) use a web-based self-service system. If they chose to meet with a HR professional they were told they would need to make an appointment at their earliest convenience. In the *no choice* condition, participants were told that they would use a WBHRIS to submit their data. All participants were told they would be given an account number and password for the system.

Type of information disclosed. Information type was manipulated by varying the information requested from participants. In the *non-medical information* condition, they were given an employment form for new hires and asked to provide such non-medical information as their home address, telephone number, educational background, previous work experience, insurance preferences and policy beneficiaries. In the *medical information* condition, they were given an employment form for new hires that asked for such medical information as their own illnesses, allergies, and prescription drugs they used. They also were asked to indicate their insurance preferences and policy beneficiaries.

Measures

Invasion of Privacy. Invasiveness was measured with a summated scale developed by Stone et al. (1983). Participants responded to the items using seven-point Likert-type scales with response alternatives that ranged from "strongly disagree" to "strongly agree." A sample item included "I feel the data collection is a violation of my rights." It merits noting that previous research (Eddy et al. 1999) has shown that scores on this measure were related to policies regarding the unauthorized release of HRIS-related data. In addition, scores on the measure were related to perceived fairness of an human resource information system (Eddy et al. 1999). The coefficient alpha reliability estimate for this scale was .91.

Satisfaction with human resource services. Service satisfaction was measured with a nine-item summated scale that used items adapted from the service quality scale of Parasuraman et al. (1988). Note that items in the service satisfaction scale were modified so as to focus on the quality of service provided by a HR department. Participants responded to the items using seven-point Likert-type scales with alternatives ranging from "strongly disagree" to "strongly agree." Examples of items are "I would be very satisfied with the service provided by the Human Resource Department in this organization" and "The

methods used to provide services to employees were extremely annoying.” The coefficient alpha reliability estimate for this measure was .93.

Analyses

Hypotheses 1–4 were tested by assessing the statistical significance of the standard partial regression coefficients (β s) for the separate regressions of invasiveness and system satisfaction on the independent variables. Hypothesis 5 was tested by assessing the statistical significance of the product-moment correlation between service satisfaction and invasiveness. Finally, Hypothesis 6 was tested using the regression-based strategy for testing for mediation outlined by Cohen et al. (2003). The test for mediation involves two regression analyses. In the first, system satisfaction (the assumed effect) is regressed on system choice (the assumed cause). The regression coefficient for choice is presumed to indicate the effect of this variable on satisfaction. In the second analysis, the assumed mediator (invasiveness) is added to the regression equation, and mediation is inferred from a drop in the magnitude of the regression coefficient for the assumed cause. If it is no longer statistically significant, the inference is that mediation is complete; if it drops in magnitude, but remains statistically significant, the inference is that mediation is partial. Note that there is no test to determine if the decrease in the value of the coefficient is statistically significant (Stone-Romero and Rosopa 2004).

Results

Table 1 provides descriptive statistics on invasiveness and service satisfaction for each of the study’s conditions. The upper triangle of Table 2 shows correlations among the manipulated and measured variables. Tables 3 and 4, respectively, show the results of the regression analyses for the outcomes of invasiveness, and system satisfaction.

Finally, Table 5 shows the results of the regression analyses used to test for mediation.

Tests of Hypotheses

Hypothesis 1 Hypothesis 1 argued that invasiveness would be lower in the choice than the no choice condition. As can be seen in Table 3, consistent with this hypothesis, the regression analysis showed that system choice influenced invasiveness, $\beta = -.19$, $t = -1.71$, $p < .05$. Furthermore, as the results in Table 1 reveal, invasiveness was lower when individuals had a choice ($M = 98.77$) than when they didn’t ($M = 107.95$).

Hypothesis 2 Hypothesis 2 predicted that service satisfaction would be greater when individuals had a choice than when they didn’t. In agreement with this hypothesis, the results of the regression analysis shown in Table 4 reveal that system choice was positively related to service satisfaction, $\beta = .37$, $t = 3.49$, $p = .000$. In addition, as the results in Table 1 show, service satisfaction was greater in the choice condition ($M = 46.53$) than in the no choice condition ($M = 38.07$).

Hypothesis 3 Hypothesis 3 argued that invasiveness would be greater for medical information than for non-medical information. In accordance with this hypothesis, the results in Table 3 show that information type affected invasiveness, $\beta = .33$, $t = 2.97$, $p \leq .01$. In addition, as can be seen in Table 1, invasiveness was greater in the medical information condition ($M = 112.12$) than in non-medical information condition ($M = 96.68$).

Hypothesis 4 Hypothesis 4 predicted that service satisfaction would be greater in the non-medical information condition than in the medical information condition. In support of this hypothesis, the results in Table 4 show that information type influenced service satisfaction, $\beta = -.30$,

Table 1 Descriptive statistics for dependent variables

Independent variable	Study 1					Study 2				
	Invasiveness			Service satisfaction		Invasiveness			Service satisfaction	
	<i>N</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
System choice (choice)	30	98.77	22.01	46.53	8.23	37	98.84	25.05	43.24	10.77
Non-medical information	16	90.06	18.69	49.75	6.07	19	88.42	18.69	47.00	9.99
Medical information	14	108.71	21.86	42.86	9.01	18	109.83	26.63	39.28	10.37
System choice (no choice)	41	107.95	23.33	38.07	11.72	31	109.68	22.85	37.42	10.58
Non-medical information	21	101.71	21.93	41.19	12.23	15	105.73	22.44	42.13	9.49
Medical information	20	114.50	23.47	34.80	10.47	16	113.38	21.36	33.00	9.84
Information type										
Non-medical information	37	96.68	21.14	44.89	10.82	34	96.06	22.81	44.85	9.93
Medical information	34	112.12	22.67	38.12	10.55	34	111.50	24.00	36.32	10.46



Table 2 Correlations among manipulated and measured variables

Variable	1	2	3	4
1. System choice ^a		-.02	-.12	.32**
2. Information type ^b	-.00		.30**	-.26*
3. Invasiveness	-.15	.29**		-.54**
4. Service satisfaction	.23*	-.37**	-.65**	

Note. Correlation coefficients in the upper and lower triangles are for Studies 1 ($N = 71$) and 2 ($N = 68$), respectively

^a Coding for system choice: 0 = no choice, 1 = choice

^b Coding for information type: 0 = non-medical information, 1 = medical information

* $p < .05$. ** $p < .01$

Table 3 Regression analyses for invasion of privacy

Independent variable	Study 1 ^a		Study 2 ^b	
	β	t	β	t
System choice	-.19	-1.71*	-.21	-1.86*
Information type	.33	2.97**	.31	2.71**

Note. All independent variables were entered into the regression equation simultaneously. We also used one tailed tests to test the directional hypotheses. Coding for system choice: 0 = no choice, 1 = choice. Coding for information type: 0 = non-medical information, 1 = medical information

^a $R = .387$, $F(2,68) = 5.99$, $p = .004$

^b $R = .382$, $F(2,65) = 5.56$, $p = .005$

* $p < .05$, one-tailed. ** $p < .01$, one-tailed

Table 4 Regression analyses for service satisfaction

Independent variable	Study 1 ^a		Study 2 ^b	
	β	t	β	t
System choice	.37	3.49**	.25	2.32*
Information type	-.30	-2.80**	-.38	-3.49**

Note. We entered all independent variables into the regression equation simultaneously. We also used one tailed tests to test the directional hypotheses. Coding for system choice: 0 = no choice, 1 = choice. Coding for information type: 0 = non-medical information, 1 = medical information

^a $R = .387$, $F(2,68) = 5.99$, $p = .0001$

^b $R = .466$, $F(2,65) = 9.02$, $p = .0003$

* $p < .05$. ** $p < .01$

$t = -2.80$, $p < .01$. And, as the results in Table 1 reveal, service satisfaction was greater in the non-medical information condition ($M = 44.89$) than in the medical information condition ($M = 38.12$).

Hypothesis 5 Hypothesis 5 argued that invasiveness would be negatively related to service satisfaction. In accordance with this hypothesis, the results in Table 2 show that these variables correlate negatively with one another, $r = -.54$, $p < .01$.

Table 5 Hierarchical regression analyses for tests of mediation

Independent variable	Study 1 ^a			Study 2 ^b		
	β	t	R^2	β	t	R^2
Step 1						
System choice	.32	2.72**	.10**	.23	1.90*	.05*
Step 2						
System choice	.26	2.57*	—	.14	1.41	—
Invasiveness	-.51	-5.02**	.36**	-.63	-6.52**	.44**

Note. Dependent variable for Step 1 and Step 2 was service satisfaction

^a Coding for system choice: 0 = no choice, 1 = choice

^b Coding for information type: 0 = non-medical information, 1 = medical information

* $p < .05$. ** $p < .01$

Hypothesis 6 Hypothesis 6 stated that the relation between system choice and service satisfaction would be mediated by invasiveness. In agreement with this hypothesis, the results in Table 5 show that in the first regression analysis the coefficient (β) for choice was .32, $t = 2.72$, $p < .01$, whereas in the second analysis it was .26, $t = 2.57$, $p < .05$. These results suggest partial mediation.

Discussion

Overall, the results of Study 1 provide considerable support for all six of the hypotheses tested by it. More specifically, the results revealed that (a) invasiveness was lower in the choice than the no choice condition, (b) service satisfaction was greater in the choice than the no choice condition, (c) invasiveness was greater for medical information than for non-medical information, (d) service satisfaction was lower for medical information than for non-medical information, (e) service satisfaction and invasiveness correlated negatively with one another, and (f) the relation between system choice and service satisfaction was partially mediated by invasiveness. These findings have important implications for extending theory and research on privacy and reactions to HR systems, especially WBHRISs. In addition, they offer suggestions for developing fair information policies and practices regarding the use of HR systems in organizations. We consider these issues below.

Theory and Research on Privacy and Service Satisfaction

The results of Study 1 provided support for several predictions stemming from the model of privacy developed by Stone and Stone (1990). As noted above, it specifies that the type of data and the individual's ability to control the disclosure of data are key determinants of invasiveness. In addition, the present study's findings support the model's prediction that procedural factors that increase perceived

control over information affect privacy-related beliefs and attitudes. In particular, and consistent with other research on privacy (Fusilier and Hoyer 1980; Tolchinsky et al. 1981), these findings suggest that a key strategy for increasing perceived control and reducing invasiveness is to give individuals the freedom to choose how information is disclosed to others. In the case of the present study, the choice was between a THRS and a WBHRIS. However, as Stone and Stone (1990) note, a number of other procedural factors may influence perceived control and invasion of privacy (e.g., the transparency of methods used to obtain information). Future research needs to assess the effects of such factors.

The study's results also suggest that invasiveness may be an important determinant of both service satisfaction and the use of HR system services. All else constant, our findings suggest that the greater the invasiveness of procedures used by a HR department to provide services to employees (e.g., web-based data collection methods) the more dissatisfied individuals will be with the procedures. As a result, we predict that the employees will be less likely to use them. Future research needs to address the use issue because behavioral outcomes were not considered by our study.

Interestingly, the results of the present study provide support for Gutek's (1995) argument that individuals will prefer relationships to encounters with automated systems in organizations. More specifically, service satisfaction was greater when individuals had a choice over system type than when they didn't. This finding would *not* have been likely if individuals were indifferent to the use of the WBHRIS and the THRS.

Previous research on technology acceptance has found that computer experience or self-efficacy may be an important determinant of acceptance of new systems (Davis et al. 1989). In view of this, research is needed to determine the conditions under which individuals prefer encounters (e.g., the use of a WBHRIS) to relationships (e.g., the use of a THRS). For example, system preference may be a function of such factors as the purpose of the transaction, the ease of system use, the computer self-efficacy of system users, the time frame, and the degree to which the system helps individuals achieve their goals (e.g., enrolling in benefits, training, applying for promotion). These and other factors that may affect employee satisfaction with HR systems should be considered by future research.

Limitations of Study 1

Although Study 1 provided some very interesting results and suggested several directions for future research, there are three potential limitations associated with it that

deserve mention. First, rather than evaluating an existing HR system, the study used scenarios to manipulate HR system policies and practices. The use of scenarios was motivated by the fact that it was critical to show that HR system policies and practices were the *cause* of invasiveness and service satisfaction, and it would be highly unethical to collect sensitive medical data in real world settings with actual employees. One of the dilemmas in conducting privacy-related research is that the data collected for such studies are often potentially invasive of privacy. Thus, we chose an experimental simulation for the study in order to protect participants from the potential harm that might accrue to them from collecting such data in actual organizations (e.g., embarrassment, loss of job opportunities). Nevertheless, the use of scenarios raises questions about the external validity of our study's findings. However, the effects of variables that are manipulated experimentally in scenario-based studies are typically weaker than those of studies in which corresponding variables are manipulated in actual organizational contexts. Consequently, our findings probably *underestimate* the effects of the system choice variable on both invasiveness and service satisfaction. Similarly, our findings no doubt underestimate the effect of the information type variable on the same two outcomes. However, we recognize that the external validity of our conclusions would be strengthened by the findings of research in naturally occurring organizational settings.

A second potential limitation of our study is that the sample consisted of a relatively homogeneous group of young, fairly well educated employees. Furthermore, most of the participants had computer experience and a number of them were employed in the information systems field. As a result, the sample may not be representative of the range of employees found in many organizations. Thus, the present study's findings need to be replicated with a more representative sample of employees.

A third potential limitation of Study 1 is that for the system choice manipulation, participants were faced with supplying data using one of two alternatives, i.e., (a) the required use of a WBHRIS and (b) the option of using either a THRS or a WBHRIS. Thus, the results of Study 1 do not provide a basis for inferring the outcomes that would result if participants were required to use a WBHRIS. Stated somewhat differently, the results of Study 1 do not allow us to rule out the explanation that the greater invasiveness and lower service satisfaction stemming from the no choice condition was actually caused by the *type of system* involved in the no choice condition (i.e., a WBHRIS). Thus, we performed a second study in which participants were faced with disclosing data using one of two alternatives, i.e., (a) the required use of a THRS and (b) the option of using either a THRS or a WBHRIS.

Study 2

Based upon the literature considered above, Study 2 tested virtually the same set of hypotheses as Study 1. In addition, it used virtually the same methods. Thus, here we repeat neither the hypotheses nor the bases for them. Moreover, we only present methodological details of Study 2 that differed from those of Study 1.

Method

Overview

The overall design of this study was identical to that of Study 1.

Participants

A total of 68 employed adults (39 men and 29 women) participated in the study. They had an average age of 31.75 years, and ranged in age from 21 to 67 years. Forty-four of the participants were White, 7 were African-American, 11 were Asian, and 6 were Hispanic-American. All had a bachelor's degree and were enrolled in a master's program in business. Finally, they had an average of 8.71 years of work experience.

Procedures

The study's procedures were the same as those used in Study 1.

Manipulations

With one exception, the manipulations used in this study were identical to those of Study 1. It was that for the system choice variable, participants in Study 2 were assigned to one of two conditions: In the *no choice* condition they were told that their data would have to be disclosed using a THRS, and in the *choice* condition, they were instructed that their data could be submitted through either a THRS or a WBHRIS.

Measures

The measures used in this study were identical to those used in Study 1. Note, however, that for Study 2, coefficient alpha reliability estimates were .91 for invasiveness and .92 for service satisfaction.

Results

Table 1 provides descriptive statistics on invasiveness and service satisfaction for each of the study's conditions. The

upper triangle of Table 2 shows correlations among the manipulated and measured variables. Tables 3 and 4, respectively, show the results of regression analysis for the outcomes of invasiveness, and system satisfaction. Finally, Table 5 shows the results of the regression analyses used to test for mediation.

Tests of Hypotheses

Hypothesis 1 Hypothesis 1 stated that invasiveness would be lower in the choice than the no choice condition. In agreement with it, the results in Table 3 show that system choice influenced invasiveness, $\beta = -.21$, $t = -1.86$, $p < .05$. In addition, as the results in Table 1 indicate, invasiveness was lower when individuals had a choice ($M = 98.84$) than when they didn't ($M = 109.68$).

Hypothesis 2 Hypothesis 2 argued that service satisfaction would be greater when individuals had a choice than when they didn't. Consistent with it, the results of the regression analysis shown in Table 4 indicate that system choice was positively related to service satisfaction, $\beta = .25$, $t = 2.32$, $p < .05$. Moreover, the results in Table 1 indicate that service satisfaction was greater in the choice condition ($M = 43.24$) than in the no choice condition ($M = 37.42$).

Hypothesis 3 Hypothesis 3 stated that invasiveness would be greater for medical information than for non-medical information. In agreement with it, the results in Table 3 show that information type affected invasiveness, $\beta = .31$, $t = 2.71$, $p < .01$. Moreover, as can be seen in Table 1, invasiveness was greater in the medical information condition ($M = 111.50$) than in the non-medical information condition ($M = 96.06$).

Hypothesis 4 Hypothesis 4 argued that service satisfaction would be greater in the non-medical information condition than in the medical information condition. In accordance with it, the results in Table 4 reveal that information type influenced service satisfaction, $\beta = -.38$, $t = -3.49$, $p < .01$. In addition, the results in Table 1 show that service satisfaction was greater in the non-medical information condition ($M = 44.85$) than in the medical information condition ($M = 36.32$).

Hypothesis 5 Hypothesis 5 stated that invasiveness would be negatively related to service satisfaction. In agreement with it, the results in Table 2 show that these variables correlate negatively with one another, $r = -.65$, $p < .01$.

Hypothesis 6 Hypothesis 6 argued that the relation between system choice and service satisfaction would be mediated by invasiveness. We tested this hypothesis using the same regression-based strategy (see Cohen et al. 2003) described above.

Table 5 presents the results of the analyses used to test for the mediating effect of invasiveness on the relation between system choice and system satisfaction. As shown in the same table, in the first regression analysis, the coefficient (β) for choice was .23, $t = 1.90$, $p < .05$, whereas in the second analysis it was .14, $t = 1.41$, $p > .05$. These results suggest complete mediation.

Discussion

Although Study 2 involved a different set of participants and slightly different manipulations than Study 1, the results of the two studies are strikingly similar. As was the case for Study 1, the results of Study 2 provided clear support for all six of the hypotheses that were tested by it. Thus, the findings of Study 2 provide a strong constructive replication of the findings of Study 1.

As noted above, a major motivation for performing Study 2 was to determine if the findings associated with the system choice manipulation in Study 1 were attributable to the way in which system choice was operationally defined (i.e., having to use a WBHRIS versus being able to choose between a THRS and a WBHRIS). In Study 2, participants experienced one of two system choice manipulations (i.e., having to use a THRS versus being able to choose between a THRS and a WBHRIS). As noted above, the effects of system choice in Study 2 were highly consistent with those of system choice in Study 1. This shows that the important element in system choice is the capacity to choose between the WBHRIS and the THRS, rather than an artifact of the type of HR system an individual must use in the no-choice condition.

Potential Limitations of Study 2

Similar to what was said about the findings of Study 1, the findings of Study 2 are subject to the same first two limitations. In the interest of brevity we do not repeat those here.

General Discussion

The results of Studies 1 and 2 have a number of important implications for future research on privacy and the design of fair information policies for a HR system. These issues are considered next.

Implications for Future Research

The findings of our studies suggest that the choice of systems and type of information collected are important determinants of invasion of privacy and satisfaction with

HR systems. As a result, we believe that giving individuals the ability to choose the type of HR system will enhance the acceptance and the overall effectiveness of such systems. However, future research is needed on other factors that may affect reactions to HR systems, especially web-based systems, including individual, organizational, and policy-related issues. For instance, future research might examine the effects of information management policies on reactions to WBHRISs, including policies on the dissemination of employment data and the ability to check the accuracy of data. Similarly, given that research on electronic recruiting shows there are individual differences in the use and acceptance of these systems (McManus and Ferguson 2003), future research might examine the degree to which older workers, women and ethnic minorities accept WBHRIS.

In addition, research is needed on the extent to which changes in system characteristics (e.g., use of firewalls, enhanced security) increase the acceptance of these systems. Note, however, that computer experts often argue that firewalls are not a cure in terms of the information security criterion (www.itsecruity.uask.ca/firewalls.html, retrieved January, 2007). In fact some analysts maintain that firewalls are analogous to the use of deadbolt locks on doors. Firewalls, like deadbolts, are only deterrents that make it harder to gain access to systems. However, firewalls are not always foolproof and skilled hackers can often gain access to information stored in web-based systems (De Gilio, personal communication, September 22, 2006). Despite these arguments, we know of no empirical research that has examined the extent to which firewalls or other security strategies affect individuals' acceptance of HR systems. As a result, research is needed on the degree to which varying security strategies affect individuals' perceptions of control over personal data including the release of data to third parties.

Consistent with the arguments just noted, the results of our studies revealed that the ability to choose the type of HR system affected perceptions of privacy or the ability to control personal information. It merits noting that we did not directly assess the extent to which choice of systems influenced the ability of individuals to control the unauthorized release of information to third parties. However, it may be the case that individuals chose the traditional HR system because they believed the use of traditional systems would limit the unauthorized release of sensitive data to third parties. Future research is needed to examine these and other issues associated with individuals' reactions to WBHRIS and THRSs.

Apart from the strategies dealt with by our research, we believe that additional research is needed on ways in which organizations can enhance the acceptance and use of new WBHRIS. For instance, previous theory and research on

change management shows that participation affects commitment to change (Cummings and Worley 1997). Furthermore, research on organizational justice suggests that participation, voice, and choice are key variables affecting the perceived fairness of new systems (Greenberg and Folger 1983). Note, however, this research implies that choice may engender only a partial and limited sense of control. Thus, additional research is needed to determine whether participating in the development of new systems produces greater satisfaction than the mere choice over the use of systems. Given the widespread use of WBHRISs, we hope our research will foster increased interest in research on reactions to HR systems.

Implications for Practice

As noted above, we believe that the results of our studies have important implications for practice. First, employers should consider limiting the types of data collected and stored in a HR system. Results of both studies revealed that individuals reacted more negatively to a HR system when the data collected were medical as opposed to non-medical in nature. Therefore, employers may want to limit the collection of data to that which is directly relevant to job performance or other legitimate criteria. If sensitive data (e.g., medical data for insurance purposes) are a business necessity, employers need to justify the collection of such data and ensure employees that the same data will be used only for legitimate purposes. Employers also should inform employees that sensitive data will *not* be released to supervisors or others who control such outcomes as layoffs, promotions, training opportunities.

In 1977, the Privacy Protection Study Commission (PPSC) recommended that employers voluntarily develop policies regarding the collection, storage, usage, and disclosure of employee data, limiting the collection of sensitive data. Consistent with the PPSC, we believe that fair information policies should be developed for each HR system used in an organization. Included in such policies should be procedures for safeguarding employee data. This may serve to both increase employees' satisfaction with HR department services and to foster trust of the organization by its employees.

Apart from the recommendations of the PPSC, two other laws in the US specify requirements for safeguarding employee health-related data. First, the Health Insurance Portability and Accountability Act (HIPAA) places restrictions on the electronic release of health data by organizations (Bennett-Alexander and Hartman 2007). In particular, the Privacy Rule of HIPAA specifies the permitted and prohibited uses and disclosures of health information by organizations. For example, HIPAA specifies that an organization is generally permitted to release

health data without an individual's authorization to (a) the person for treatment, (b) governmental authorities for court orders and investigations, (c) medical examiners to determine cause of death, and (d) Health and Human Services (HHS) for compliance investigations. Second, the Americans with Disabilities Act (ADA) places restrictions on the release and storage of health or disability-related data. For example, in 1997 the Equal Employment Opportunity Commission (EEOC) ruled that if employees ask questions about a co-worker with a disability the employer may not disclose any medical information about the co-worker (Bennett-Alexander and Hartman 2007). Similarly, the ADA requires that medical records for employees with disabilities be kept separate from other employment records (Stone and Williams 1997). Although there are some restrictions on the release and storage of health-related data, we recommend that employers develop specific privacy policies that allay employees' concerns about the unauthorized use and disclosure of these data. Likewise, employers must develop strategies (e.g., firewalls, separation of medical and employment files) to ensure that WBHRISs do not violate employees' actual or perceived rights to privacy.

Although WBHRISs may increase efficiency and reduce labor costs in organizations (Gueutal 2003), it is also clear that such systems will not be effective if they do not provide needed service to clients (i.e., managerial and non-managerial employees). Although many firms have been quick to switch from THRSs to WBHRISs, they often fail to consider whether these systems help them reach the goals of attracting, motivating and retaining a skilled workforce (Stone et al. 2003; Walker 2001). Oftentimes the organization's focus on the cost-savings of WBHRISs has overshadowed the impact of the system on such outcomes as service satisfaction and invasiveness.

In recent years, some HR practitioners (Bloom 2001; Walker 2001) have begun to question the overall effectiveness of WBHRISs. For example, Bloom (2001) argued that many WBHRISs are too standardized and impersonal, and lead employees to experience frustration with their use. The inflexibility and impersonalized nature of WBHRISs may also explain the numerous problems encountered during their implementation, and the reasons for employee complaints about them (Towers Perrin 2001). As a result, Bloom suggests that personalized service may help (a) employees become more comfortable with WBHRISs, and (b) HR departments reach their goals. Similarly, Ulrich (2001) maintains that personalized systems may make WBHRISs more useful and help HR departments attract and retain talented employees. For example, he notes that people have different needs at different times in their lives. In particular, an employee in his or her twenties who is in good health and has no spouse or children may not have

special benefit needs. As a result, he or she may prefer the efficiency and speed of enrolling in benefits with a WBHRIS. However, in order to meet his or her unique needs, an employee who is approaching retirement and who has a spouse, children, and health problems may prefer to get advice on such matters as benefits or retirement programs from a HR professional. As a result, providing employees with a choice of a THRS or a WBHRIS will help to meet their needs.

Although increased efficiency and cost-savings are key reasons for organizations implementing WBHRISs, some HR analysts (Walker 2001) have argued that too much emphasis has been placed on the cost savings associated with these systems. In particular, Walker (2001) recommends that when organizations design and develop a new computerized or WBHRIS, they ought to consider the impact of such systems on individuals. Thus, along with others (e.g., Bloom 2001; Stone et al. 2003; Walker 2001), we believe that HR systems should be designed with an appreciation of several important objectives including (a) the attraction and retention of talented employees, (b) the improvement of productivity, (c) the control of administrative and labor costs, and (d) the responsiveness of such systems to the needs of employees. As a result, we maintain that although giving employees the ability to choose the type of HR system may be more costly in organizations, the use of this strategy may also enhance the acceptance and long-term success of these systems. In support of this argument, research on sociotechnical systems (Trist and Bamforth 1951) clearly shows that technical systems are more effective when organizations design them in light of the social needs of individuals.

General Conclusions

Overall, the use of WBHRISs is growing at a very rapid rate. Some estimates suggest that over 90% of large firms now use WBHRISs (Gueutal and Stone 2005). Despite the widespread use of such systems, little empirical research has examined their effectiveness. As a result, such systems have been implemented and system policies developed without the benefit of sound research on the issue. Our study helps fill the gap in research by examining the effects of two key variables that affect reactions to a HR system. Its findings suggest that when organizations develop and implement a HR system, especially computerized or web-based, they should consider both its invasiveness and the service satisfaction that is likely to result from its use. By doing so, organizations will be able to develop systems that helps them achieve their strategic goals and meets the needs of employees.

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