The Study on The Relationship Between Privacy Concerns and Information Systems Effectiveness

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THE STUDY ON THE RELATIONSHIP BETWEEN PRIVACY CONCERNS AND INFORMATION SYSTEMS EFFECTIVENESS

Completed Research Paper

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ABSTRACT

We examined the impact of users’ information privacy concerns on information systems (IS) effectiveness in organizations. Specifically, we investigated system users’ psychological mechanisms that may involve in the relationship between privacy concerns and IS effectiveness (i.e., perceived usefulness and IS satisfaction) via information systems reactance (ISR) on systems and procedural justice (PJ) toward their Information systems. The results supported our hypotheses in that: (1) Privacy concerns were negatively related to system users’ perceived usefulness and IS satisfaction, (2) Both ISR and PJ of the system users mediated the relationships between privacy concerns and IS effectiveness. We discuss the implications of the findings for theory and practice, and their limitations and the directions that future research in this area might explore.

Keywords: privacy concern, information systems effectiveness, psychological reactance, procedural justice, mediation.
Introduction

A great deal of research has paid increasing attention to information privacy (Awad and Krishnan 2006; Malhotra et al. 2004; Rust et al. 2002). Especially recent research on information privacy concerns has largely focused on e-commerce context, in particular the privacy paradox in relation to consumers’ behavioral intentions and their willingness to release their information (See Awad and Krishnan 2006). However, in spite of these efforts, there has been relatively little research on the effect of information privacy on the implementation of information systems in an organizational context, as compared to widely cited predictions of the effect of information privacy concerns on people’s behavior in ecommerce market structures (AMA 2001; Ambrose and Alder 2000; Kidwell and Bennett 1994). Further, there has been little attention paid to the psychological mechanisms which explain how the user’s information privacy concerns affect IS effectiveness.

When employees perceive that their privacy is being invaded by monitoring or surveillance systems operated by their organization, they often feel they are being treated unfairly by the organization (i.e., procedural justice) and eventually, such perception may negatively affect their job performance—which may depend on these same information systems—may be negatively affected (See, Alge 2001). In addition, the privacy concerns not only lead employees to react negatively but they may also discourage the employees from effectively using information systems to achieve maximum work performance. Thus, procedural justice and psychological reactions can be considered critical factors in exploring the impacts of privacy concerns on the effectiveness of information systems in organizations.

Given our understanding of the effect of information privacy on information systems (IS) effectiveness, we aims to describe the psychological mechanism that explains how information privacy concerns influence the user’s feelings and/or perceptions (i.e., procedural justice, psychological reactance) and the proactive performance on IS effectiveness. Specifically, we examine the initial relationship between information privacy concerns and information systems effectiveness and explore how individual’s perceptions affect the relationship by decreasing and increasing the effects of privacy concerns. To proceed toward a more complete understanding of the process by which the mediators become related to the relationship, it is vital to gain deeper insight into the nature of the underlying psychological mechanisms.

The main research questions addressed by this paper are: (1) Do privacy concerns affect IS effectiveness? and (2) If so, what are the underlying individual as well as organizational factors involving in the relationship between information privacy concerns and IS effectiveness? This paper investigates such questions by exploring the mediation relationship between privacy concerns and IS effectiveness. Specifically, the present paper examines whether the two psychological constructs (i.e., psychological reactance and perceived procedural justice) positively or negatively involve in the effect of privacy concerns on IS effectiveness.

The current study makes both theoretical and empirical contributions. First, this paper provides a detailed description on the mechanisms driving information security and privacy concerns and this contributes to a better understanding of how systems users’ perceived privacy concerns affect their use of information systems to enhance their performance. Second, this paper identifies the psychological mechanisms by which the relationship between information privacy concerns and IS effectiveness relationship can be negatively mediated by two psychological constructs (i.e., perceived psychological reactance on IS and procedural justice). Lastly, it sheds light on the negative mediating role of IS reactance by examining the effect on the relationship between perceived privacy and three different factors affecting IS effectiveness.

Theoretical Background

This study proposes that information privacy concerns bring intrinsically negative feelings and attitudes toward information systems and that leads to decrease of IS effectiveness that helps the effective functioning of organizations (see Figure 1). This study assumes that the negative feelings (or attitudes) caused by perceptions of information privacy concerns requires a translating mechanism to reflect the valued attitudes and behaviors relating to IS effectiveness. In this case, we argue that procedural justice and psychological reactance could act as a viable translating mechanism. As shown in the figure, the research model of the current study proposes that information privacy concerns are important to organizations in at least two ways. First, this paper proposes that information privacy concerns encourage people to have negative feelings about information systems by enhancing their sense of psychological reactance and degrading procedural justice. Second, the current study proposes that information
privacy concerns decrease the likelihood that people would engage in their job by using IS. In conceptualizing IS effectiveness, this study focuses on two categories of the concept that have theoretical links to information privacy: perceived usefulness and user satisfaction.

![Proposed Model]

**Figure 1. Proposed Model**

**Information Systems Effectiveness**

The concept of information systems (IS) effectiveness has been widely accepted in IS research as a principal criterion for assessing organizational performance resulting from the usage of information systems (Rai et al. 2002). Although a variety of conceptualizations have been offered among IS researchers, the core concept of IS effectiveness indicates the degree of organizational performance which is triggered from the usage of information systems (Hamilton and Chervany 1981; Raymond 1985). In order to capture IS effectiveness, IS researchers have used diverse constructs that are able to accurately tap into the concept (DeLone and McLean 1992; Rai et al. 2002; Seddon 1997). Based upon the extensive review of previous literature, we assesses IS effectiveness by examining two factors: perceived usefulness and users’ IS satisfaction. These are well suited for the initial purpose of the study that explores individual- and organizational antecedents in terms of perceived usefulness. In addition, since they have been widely accepted in assessing IS effectiveness in the IS field as valid and reliable constructs (See DeLone and McLean 1992; Rai et al. 2002; Thong et al. 1996), it is believed that such factors are appropriate to represent overall IS effectiveness.

According to DeLone and McLean (1992), individual impact refers to the positive effect of information systems on an individual’s performance. They explain that the term “impact” in itself indicates performance or productivity. Several items have been used to evaluate individual impact, such as, net benefits, individual job performance, individual productivity, etc. Seddon (1997) used perceived usefulness in place of individual impact. Rai et al. (2002) considered perceived usefulness as individual impacts because it is based on several of the constructs DeLone and McLean (1992) had linked to individual impacts, such as improved individual productivity. Also, they used the construct with past usage to better reflect users’ individual impact. Therefore, in consistent with past research (See, Rai et al. 2002; Sabherwal et al. 2006; Seddon 1997), this study uses perceived usefulness as a construct of individual impact. Similarly, IS satisfaction refers to the end-users’ overall affective and cognitive evaluation of the level of consumption-related fulfillment that is experienced with information systems (Au et al. 2002). User satisfaction instruments, as dependent variables, have been used widely in research on IS implementation in both large and small businesses (Khalil and Elkordy 1999; Thong and Yap 1996).

**Information Privacy Concerns in Organization Contexts**

Privacy is defined as “the ability of the individual to control personally information about one’s self (Stone et al. 1983: p. 460)” or “the claim of individuals, groups, or institutions to determine for themselves when, how, and to what extent information about them is communicated to others (Westin 1967: p. 7)”. Privacy has been discussed in

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1 For the IS usage, IS may be used due to subjective motivations such as a mandate from management, political motivation or self-protection for justifying "poor" decisions (Ginzberg 1978; Livari 1987) and in reality, financial institutes, such as banks mostly rely on their own information systems. Therefore, system usage is excluded to conceptualize IS effectiveness in this study.
much detail from both an individual’s viewpoint and an organizational context (Culnan 2000; Smith et al. 1996). In organization contexts, privacy emerges as an issue because of a fundamental tension between organizational needs and individual rights (Westin 1967). In other words, organizations face increasing pressures to gather information in order to effectively operate the organizations as a whole. On the other hand, individuals have privacy when they can manage or control their information (Stone and Stone 1990). However, when individuals perceive loss of control, they feel invasion of privacy (Alge 2001). This feeling makes them have concerns on their privacy in organization contexts whenever they work using information systems. Most employees have an expectation of privacy when they engage in the aforementioned activities. Therefore, people perceive privacy invasions when they are not granted sufficient control on the solicitation, storage, use, and disclosure of various types of personal information (Hann et al. 2007).

Along with the definition of privacy, in this study, privacy concern is defined as a perception that an organization monitors or accesses to information that is disclosed when using the organizational information systems and how it is used. This definition includes an individual’s subjective views of fairness in the context of information privacy (Campbell 1997) and an individual’s personal traits or general disposition to privacy invasion that is affected by external conditions such as industry sectors, cultures, or regulatory laws (Malhotra et al. 2004). Advances in information technology make organizations enhance the protection of their information systems from internal and external attacks. For example, monitoring and control systems can read employees’ email, track locations, monitor web usage, or peer in on computer screens (Alge 2001). Management has growing concerns about information security, internal attack/theft, and information abuse at work, which are costly and increase the need for surveillance of employee activities. The monitoring or information gathering by organizations triggers privacy concerns based on a perception that personal information is used unfairly and in turn, this privacy concerns make people sense psychological reaction and unfairness within the organization. In this study, the definition of privacy concern focuses on information systems usage.

**Privacy concerns on information systems effectiveness.** This study proposes that the employees’ concerns for their work information or private use of Internet and email affect the usage of information systems and in turn affect their job performance. There might be a conflict between organizations and employees in attempting to protect information in the organizations. Management in the organizations may increase the organizational level of security by using monitors and they may control the employees who could jeopardize the security of organizational assets; in turn the employees will seek to protect their privacy (Alge et al. 2006). This dilemma is a unique characteristic of information privacy in organizations that can be differentiated from information privacy in an ecommerce context. That is, when management tries to enhance security by monitoring information systems, employees feel that their privacy is being invaded (Alge 2001).

This protection mechanism of an organization may discourage employees from using organizational information systems effectively and efficiently. As a result, their work performance related to information systems would become less satisfactory. In other words, privacy concerns can lead users to have negative intention in using information systems. Regarding the aforementioned issue, past research empirically shows the negative relationship between information privacy concerns and behavioral intentions (Awad and Krishnan 2006; Dinev and Hart 2006). In organizational contexts, information privacy concerns can have an effect in two ways: First, individually, privacy concerns change employees’ attitudes towards information systems. As Stone et al. (1983) mentioned, perceived privacy concerns affect IS satisfaction. That is, the perception of the invasion of private information deters an employee from the desire to use information as a consumer (or a user) of information systems in the most effective manner possible while completing their tasks. This is consistent with the Theory of Reasoned Action suggesting that an individual’s behavioral intention is determined by perception (i.e., subjective norm) (Fishbein and Ajzen 1975). Therefore, employees who harbor concerns about their personal information are not satisfied with using their information systems embedded in the organization; Second, privacy concerns can contribute to the reduction of IS effectiveness in workplaces. Privacy concerns may minimize individual effectiveness because of employees’ low confidence and expectations of privacy in relation to their personal information. In using information systems, which ultimately results in organizational performance, the users’ concerns for privacy may prevent them from having high levels of confidence and motivation to utilize the existing or newly introduced information systems. This may discontinue their use of the information systems, which then affects individual performance negatively. Therefore, employees’ privacy concerns could affect organizational performance derived from IS. Thus, we argue that employees’ information privacy concerns would be negatively related to their perceived usefulness as well as IS satisfaction. Therefore, we propose the following hypotheses:

**Hypothesis 1a:** Information privacy concerns are negatively related to IS satisfaction.
Hypothesis 1b: Information privacy concerns are negatively related to perceived usefulness.

Theory of Psychological Reactance

Psychological reactance theory can be explained by psychological reactance theory. Psychological reactance theory states that people react against attempts to control their behavior (Brehm 1966). According to Brehm, psychological reactance is “the motivational state that is hypothesized to occur when freedom is eliminated or threatened with elimination” (Brehm and Brehm 1981, p.37). Reactance produces a desire to restore one’s attitudinal or behavioral freedom, which directly causes the failure of the persuasive message. The reactance concept, therefore, is considered “a motivational state of resistance (Algesheimer et al. 2005, p.31”)”. Accordingly, this resistance in employee behavior seeks to challenge, disrupt, or invert prevailing assumptions, discourses, and power relations (Collinson 1994).

The arousal of such reactance creates a motivation to reassert the threatened freedom. Previous research demonstrates a variety of reactance effects, including acting counter to persuasion attempts (e.g., Brehm and Sensenig 1966), refusing to return an (obligating) favor (Brehm and Cole 1966), and desiring the unattainable (e.g., Brehm et al. 1966). The reactance concept has also been suggested as an important psychological construct in individual behavior (Clee and Wicklund 1980).

Privacy concerns on information systems reactance. Previous research shows that reactance is a response to managerial control in an organizational context (Jermier et al. 1994). Since organizations have an increasing need to monitor and control members who may jeopardize the security of organizational assets (Alge et al. 2006), the surveillance and monitoring technologies have been used to observe the activities of their employees. This leads to privacy concerns and because of that, people react through their use of information systems in their workplace.

The model that we propose in this study builds on previous research, which shows that perceived privacy concerns are a distal factor that influences individuals’ behavior through the mediating effects of motivation processes. That is, we attempt to explain why employee’s perceived privacy concerns affect both their reactions (i.e., IS Reactance) to their job and their work performance regarding information systems. Individuals are also motivated to prevent a further loss of freedom and to re-establish whatever freedom they may have already lost or had threatened. Reactance assumes that at any given time, a person has a set of concrete, behavioral actions that they may realistically engage in at any time (Brehm 1966; Brehm and Brehm 1981). Additionally, psychological reactance theory suggests that, in response to a loss of freedom, employees will feel uncomfortable and attempt to regain control of their privacy in using information systems.

This study posits that users’ privacy concerns as an impersonal source of threat arouse the reactance as the degree of their privacy concerns increases; as Clee et al. write, “the threats create reactance in proportion to their strength” (Clee and Wicklund 1980 p. 390). That is, the strength of threat (i.e., privacy control/monitoring) that employees perceive in relation to IS is dependent upon how severe the threat seems to be and whether or not they have control over the actual threat. Therefore, the perception of the invasion of one’s privacy likely results in feelings of irritation and ultimately the avoidance of the IS.

In turn, these attitudinal evaluations of the information systems influence employees' levels of engagement in information systems through the mechanisms explained above. Given the relationships between perceived privacy, IS reactance and IS effectiveness factors, we propose that perceived privacy concerns influence IS effectiveness factors through their effect on IS reactance. Therefore, employees experience constraints and perceive less freedom to act with information systems. To the extent that belonging to the organization and conducting the tasks in the organization is perceived as entailing an obligation to think and act in certain ways, the employee may experience reactance. This is consistent with Brehm’s theory that reactance increases as perceptions of constraints increase. Therefore, we propose the following hypothesis:

Hypothesis 2a: Information privacy concerns are positively related to IS reactance.

Psychological reactance on information system effectiveness. Past research shows that reactance may have a ‘boomerang effect’ which is commonly used when referring to threats to attitudinal freedoms (Clee and Wicklund 1980). When individuals perceive that their freedom has been threatened, they experience reactance, and as a result, they express their own threatened attitude or behavior (Brehm 1966). The individual is increasingly interested in whatever free behaviors (or attitudes) are threatened, and similarly there is a decreased attention to behaviors or
attitudes that are expected from them (Clee and Wicklund 1980).

This study posits the influence of reactance on an individual’s performance in information systems. For instance, employees will be reluctant to use information system for doing their tasks (i.e., reactance) when they feel that their organization monitors their information or controls email usage (i.e., threaten). The primary effect of such reactance is that employees who experience it try to reassert their freedom (i.e., monitoring or controlling employees’ usage of IS), and they are motivated “to move in the direction opposite from the influence effort” (Clee and Wicklund 1980: p. 390). One way to reassert freedom is to work less and eventually their productivity on information systems is lower (Algesheimer et al. 2005).

Reactance is also likely to have a negative effect on the employee’s satisfaction in using the information systems. People who have negative feelings (i.e., IS reactance) are more likely to be motivated to take on stimulating challenges in their jobs (Deci and Ryan 1985). This logic provides that employees with high intrinsic motivation are likely to display high satisfaction with their jobs; similarly, Keaveney et al.(1993) propose and report a significant positive relationship between intrinsic motivation and job satisfaction. Since reactance is a motivational force that leads a person to try to reestablish the threatened freedom, a clearly predicted consequence of reactance is that the person tries to perform the threatened or restricted behavior or attempts to strengthen his or her hold on the threatened attitude. Therefore, perceived privacy concerns lead an employee to oppose using information systems and often strongly dissuade other employees from using the information systems. Another upshot of reactance should be to motivate the employee to disobey the employer rules with regard to the information systems in order to regain his or her lost freedom (i.e., privacy). Thus, we propose the following hypothesis:

As previously mentioned, perceptions of reactance can degrade one’s satisfaction with his or her organization’s information systems, which may be accompanied by a stronger tendency toward decreased organizational performance. When an organization creates conditions which control individuals’ information in using information systems in the organization, social identity and exchange motives should lead employees to reciprocate by engaging in an attitude directed at the organization information systems; this will in turn enhance the performance of the organization. Individuals restricted by reactance are reluctant to use the systems to enhance their performance and they lack the confidence that such systems would be valued for their works. Privacy concerns from intense information gathering and control activities inhibit the effective use of information systems among workers that is important for the effectiveness of information systems. Therefore, the privacy concerns that influence information systems affect the effectiveness of information systems through information systems reactance in such procedures. Thus, we propose the following hypotheses:

Hypothesis 2b: IS reactance will mediate the relationship between privacy concerns and perceived usefulness.

Hypothesis 2c: IS reactance will mediate the relationship between privacy concerns and IS satisfaction.

Procedural Justice

Procedural justice is based on the notion that people seek fairness in the way that they are treated by the formal procedures governing the determination of outcomes such as pay or promotions (Colquitt et al. 2001; Thibaut and Walker 1975). That is, employees are more likely to perceive procedural justice when organizational procedures are consistently applied to employees based on ethical and moral standards. If the procedures are not uniformly applied, procedural justice perceptions can be maintained if employees are given opportunities to appeal or challenge the decisions (Lind and Tyler 1988).

In support of these theoretical notions, previous research has indicated that employees perceiving high levels of procedural justice are more likely to engage in organizational citizenship behavior. Specifically, this sense of procedural fairness becomes the impetus for citizenship behaviors by heightening employees’ trust in their supervisors (Konovsky and Pugh 1994), perceptions of organizational support (Wayne et al. 2002), and/or feelings of high quality leader-member relationships (Masterson et al. 2000).

Procedural justice research emphasizes the process through which decisions are made in conflicts of interests as the primary determinant of disputing parties’ perceptions of fairness (Taylor et al. 1995). The concerns about dispute resolution or decision-making procedures arise because people care about their long-term social relationship to the authorities or institutions that employ the procedures. Such procedures have important implications for individuals’
feelings of self-worth and self-values on group standing in organizations (Taylor et al. 1995).

**Relationship between privacy and procedural Justice.** Research on information privacy concerns has been focused on procedures, such as authorization procedures, the consequences of information release, the target of release, advanced notice and the purpose of the request (Alge 2001; Ashworth and Free 2006; Bauer et al. 2006; Culnan and Armstrong 1999; Eddy et al. 1999). Leventhal (1980) first articulated a relationship between privacy and procedural justice in his discussion of the ethicality rule. Subsequent empirical research has supported the notion of invasion of privacy and procedural justice as distinct, albeit related constructs (Eddy et al. 1999). Bies (1993) identified privacy factors that also were related to perceptions of procedural justice. Past research shows that privacy not only becomes a procedural justice issue when peoples’ moral expectations about control over their personal information are violated (Bies 1993) or in the ethical rule to judge procedural fairness (Leventhal 1980), but it also is an important antecedent to procedural justice in some areas such as information handling (Eddy et al. 1999) and employee selection (Gilliland 1993).

According to Alge (2001), justification for the relationship between privacy and procedural justice is based on the identity of the self-concept, which consists of personal and social identity. He argues that personal identity might affect social identity which plays a role in procedural justice theorizing. Procedural justice perception is an outcome of social identity. Procedures that affect perceptions of control over personal information (i.e., privacy) are a key source of personal identity. Therefore, privacy becomes an important antecedent condition for maintaining a positive social identity by controlling which groups and individuals one interacts with and how one is viewed by them. With this research, when privacy concerns arise in the use of information systems, individuals will perceive procedural justice to be unfair.

**Hypothesis 3a: Information privacy concerns are negatively related to procedural justice**

**Procedural justice on information systems effectiveness.** Previous research shows that employees’ perceptions of procedural justice affect their job satisfaction (Lowe and Vodanovich 1995). Several studies find empirical evidence of procedural justice effects on satisfaction. Research in the legal and political areas finds that perceptions of procedural justice lead to greater overall satisfaction with the decision-making experience (Tyler 1988). Similarly, within organizational settings, research shows that using fair procedures to administer organizational outcomes, such as pay raises, performance evaluations, and grievance claims, generates high levels of systems and job satisfaction (See Greenberg 1996). This relationship between procedural justice and satisfaction is further highlighted by research that suggests certain attitudinal outcomes, such as satisfaction, are affected by procedural justice (Alexansder and Ruderman 1987).

Further, perceptions of fairness regarding the opportunity to influence privacy concerns may encourage positive IS related work attitudes, including IS satisfaction, as procedures have been found to arouse positive affect and greater overall satisfaction with the experience (Lind and Tyler 1988). Employees who perceive their privacy is kept fairly may remain and/or become emotionally more committed to the organization and satisfied with the organization. Overall, the research suggests a link exists between employees’ perceptions of procedural justice and their satisfaction with their supervisor and organizational commitment.

There is also empirical support for this relationship (Babakus et al. 996). Employees who are intrinsically motivated by high concerns for privacy are expected to experience less procedural justice because they perceive their activities relating to information systems to be controlled by the organization. Intrinsic motivation seems more likely to affect IS satisfaction, assuming that IS satisfaction is an antecedent of organization impact. Intrinsically motivated by procedural justice, employees are going to be less likely to seek out and clarify jobs relating to information systems, thus reducing IS satisfaction. Eventually, the perception of low procedural justice will motivate employees to decrease their positive attitude toward using information systems.

Further, procedural justice concerns are salient when the organizational goal is group harmony which will eventually affect performance through its effects on attitudes (Aryee et al. 2004; Cohen-Charash and Spector 2001). Therefore, high procedural justice results in more positive attitudes toward decisions that might be otherwise viewed negatively (Korsgaard and Roberson 1995), while low procedural justice (i.e., injustice) influences attitudes toward the organization and its authorities, and in turn negative attitudes negatively affect performance (Brockner and Wiesenfeld 1996; Greenberg 1987).

In information systems context, as information privacy concerns lead negative (or low) procedural justice, negative (or low) procedural justice causes employees to have a negative attitude toward using information systems, thus the perceived usefulness of IS on performance would lower. Fairness leads employees to perceive the work environment
as less risky; they will consequently develop confidence in the safety of their investment of time and effort (Aryee et al. 2004) and form a group value perspective (Lind and Earley 1991). Procedural justice communicates to employees that they are valued by the organization. This creates an environment in which task and contextual performance occurs effectively in organization. With this logic, employees perceive their information systems related to their task. Therefore, procedural justice creates a positive perception of the impact of IS on individual performance.

Hypothesis 3b: Procedural justice mediates the relationship between information privacy concerns and perceived usefulness.

Hypothesis 3c: Procedural justice mediates the relationship between information privacy concerns and IS satisfaction.

Methods

Research Context and DATA Collection

The present study was conducted in the context of a bank which conducts its’ own surveillance & monitoring systems in which electronic technologies are used to collect, store, analyze, and report the actions or performance of workers. According to past research this system brings concerns over invasion of privacy (Assessment 1987), stress (Nussbaum and duRivage 1986, Winter; Smith et al. 1992), and deterioration of morale (McLaughlin 1989, October), while provides employees with more feedback and more objective performance evaluations (Fenner et al. 1993) and increasing productivity levels (Bylinksky 1991). This study, however, focuses on users privacy concerns resulted from the systems that is one of the negative crops and factors mitigating the privacy concerns from performance. As Ambrose et al. (1998) categorized, computer-monitoring category only looks at keystroke recording. In this study, therefore, the scope of monitoring focused much narrower because only employees’ work-related activities are captured. Hence, the computer monitoring category of this study is limited to keystroke recording, which generates only work-related statistical data and does include Internet usage and e-mail monitoring.

Surveys were administered to employees embedded in the headquarters, as well as to 25 local branches of a large American-based multi-national bank located in Seoul, Korea. Two branch managers of the bank had predetermined interview to explain how the banking systems are used by employees in branch under surveillance and to get their feelings about usage of the systems. In this way, it was able to identify that the bank have surveillance systems to control and monitor employees’ usage of the information systems and their work performance. Finally, authors obtained a good preliminary understanding of the surveillance for protection of the bank’s information systems through interviews with the managers. Although it was not the primary purpose of these interviews, authors also benefitted from their perspective to gain a preliminary understanding of employees’ reactions to information systems and of how they adapted. Therefore, the sample from the bank well represented the purpose of the study on examining the relationship between information privacy concerns and IS effectiveness including employees’ individual and organizational impacts and IS satisfaction.

Each branch consists of 10 to 20 employees. Employees work in an interdependent fashion to provide financial services to customers and have as their core function, one of the following activities: retail banking, customer service in the area of personal banking, or specialized customer service in the area of loans and financial instruments by using information systems. In order to execute such tasks, the bank operates information systems which are a customized combination of banking software, hardware, and peripherals. Since the information systems are essential tools for employees’ daily work, all employees who participated in the surveys were familiar with the usage of the systems. Since all participants were Korean, survey items were translated into Korean and then translated back into English to ensure conceptual equivalence and comparability with the original items, prior to the planned surveys (Brislin 1986).

Three hundred and fifty two questionnaires were distributed to the employees of the headquarters and to the 25 local branches of the bank; 268 questionnaires were returned. Of the returned surveys, 251 were considered usable (after removing surveys that had a relatively high amount of missing responses, and/or those in which the same value was circled consecutively even for reverse questions). Thus, the matched response rate was 71 percent. Approximately 57 percent of the employee sample was female. The average age was 37 (s.d. =7.5). The majority of the sample (86.5%) reported “college or university degree” as their highest level of education. The average organizational tenure was high among this sample at 67 months (more than 5 years).
Measures

Privacy concerns. Five items from the privacy concerns scale were used to measure privacy concerns from previous research indicating on a 7–point scale. For example, “I feel that my organization’s information policies and practices are an invasion of privacy”, “I feel uncomfortable about the types of personal information that my organization collects” (Alge et al. 2006; Eddy et al. 1999; Stone and Kotch 1989; Tepper and Braun 1995).

Information systems effectiveness. Consistent with the theoretical arguments made earlier, authors operationalize information systems effectiveness with multiple perceptual dimensions—perceived usefulness and satisfaction of information systems as general perceptual measure of net benefit of IS use (Seddon 1997). As shown in Figure 2, indicators for the two dimensions were drawn from prior research measuring perceived usefulness with IS satisfaction (Rai et al. 2002; Seddon 1997). These two dimensions should not be considered in isolation from each other; rather, they should be viewed as mutually reinforcing elements of value creation along the value chain. Hence, the construct of the information systems effectiveness represents an integrative measure of the level of firms’ performance along these two dimensions. First, for Perceived usefulness, we used four items developed by Davis (1989) and adapted to Rai et al. (2002) and , tapping into individual productivity, task performance, time saving on the job, and individual effectiveness on the job. However, different with original items, the future-orientation of Davis’s instrument was changed to better reflect past usage. Items were designed as a 7-point scale (1, strongly disagree, to 7, strongly agree). For example, respondents were asked to indicate the extent to which the current information systems of the bank improved their individual performance. IS Satisfaction was measured by five items from Raymond (1985) and Doll et al (1997). Respondents were asked to indicate on a 7-point scale (1, strongly disagree, to 7, strongly agree) the degree to which they were satisfied with each item in terms of timeliness of reports, accuracy of reports, reliability of reports, convenience of systems, and ease of use.

Information systems reactance. Mediating variables are the information systems reactance and procedural justice. Authors drew upon the survey undertaken by 25 branches of a bank to generate an average quality of instruction score for each branch. This study relied on seven items which are based on the Hong et al. (1996).

Procedural justice. This is measured by four items. For, example, the items cover the extent to which the procedure used to govern the dissemination of my personal data are fair, the procedures used by my organization are just, and the methods used to monitor my performance were fair. These items are consistent with the procedural justice scale adopted by Eddy et al (1999) in their study of fairness and privacy.

Control variables. To control unknown effects, we included six control variables in the analyses. First, three controls (i.e., gender, age, and education) were included because these demographic factors were related to some of the contextual and dependent variables included in the study. Prior research has linked gender differences, age, job position and education to perceptions of the work environment and IT (Ahuja and Thatcher; Gefen and Straub). Second, previous research suggests that other variables need to be considered when examining the impact of different teams on performance in an organization. The team type (operation vs. marketing) and position of an organization were identified as an important control variable due to differences in (1) overall objectives and (2) interorganizational dependencies for firms in different teams. Third, the extent of an individual’s experience in using information systems represents another influence on information system effectiveness. Employees’ experience with the specific information systems may affect their reactions to a specific Internet-based application (Marakas et al. 1998).

Data Analysis

This study used structural equation modeling procedures implemented in AMOS 4.0 to perform a simultaneous evaluation of both the quality of measurement (the measurement model) and construct inter-relationships (the structural model). AMOS 4.0 provides the ability to model latent constructs even under conditions of non-normality and medium- to large-size samples (Chin 1998). In addition, the mediation effects of two mediators (i.e., PJC and ISR) by using two complementary methods were tested: (1) comparing a full model (a model including direct and indirect paths) to a nested one (a model including only indirect paths) for individual mediated effect. Since these two models can be obtained from AMOS results, the comparing process between the two models gives us statistical conclusions about model fit that is based on the difference between χ2 of the two models. Since this study has two mediators affecting the same dependent variables, one of the mediators was excluded to identify the sole effect of a mediator through the comparison of the two models. Exploring specific mediated paths provides information on the unique effect of each mediator while controlling for the other mediator (Kenny et al. 1998);(2) he mediation effects
using Sobel’s (1982) test, which has been suggested as a powerful test for mediation by prior research (MacKinnon et al. 1995) to ensure the hypothesized relationships.

**Common Methods Bias**

Since the predictor and criterion in this study were evaluated by employees in organizations, this may cause the concern of the potential method bias. In order to reduce it, we employed several statistical and procedural methodologies recommended by Podsakoff and colleagues (2003). As a statistical remedy, we determined the common method bias using Harman’s single-factor test by simultaneously loading all items in factor analysis using Varimax rotation (Podsakoff et al., 2003). All indicators showed high factor loadings and low cross-loadings. Each principal component explained almost an equal amount of 38.345 total variance. This indicates that our data do not suffer from common method bias. Next, we alleviated evaluation concerns of the respondents by emphasizing both assurances of confidentiality and no judgment in relation to the answers. In addition, we used the two different response formats for the constructs assessed in this study. Furthermore, the correlation matrix (Table 1) did not indicate any highly correlated factors (highest correlation = .70). According to Bagozzi et al. (1991), evidence of common method bias should have resulted in extremely high correlations ($r > .90$). Finally, recent literature suggests that common method bias may be overstated (Spector 2006). Spector suggests that if common method bias was so serious, it would be expected inflated correlations among all variables measured with the same self-report survey, which did not appear to be the case with our results.

**Results**

**Measurement Model for Testing Mediated Effects**

In this study, the two-step approach was used (See, Anderson and Gerbing 1988; Segars and Grover 1993) to first assess the quality of the measures through the measurement model by using confirmatory factor analysis; convergent validity, unidimensionality, and discriminant validity of each construct were assessed.

Table 1 shows discriminant validity which was assessed by testing the significance of correlations between pairs of construct items (Anderson and Gerbing 1988). Three techniques were used (Bollen 1989; Joreskog and Sorbom 1993) because the square root of each construct’s AVE is larger than its correlations with other constructs (Chin 1998; Fornell 1981). As shown in Table 1, AVE of the diagonal elements in the matrix showed that the AVE of each construct is higher than its correlations with other constructs. Therefore, adequate discriminant validity was obtained based on the results of the measurement model.

Table 2 shows the psychometric properties of the items. Most items exhibited high-factor loading (above 0.70) except four items in four constructs which were slightly below the cut-off, indicating adequate reliability and statistically significant t-value, reflecting unidimensionality and convergent validity (Bollen 1989). In addition, the average variance extracted (AVE) for each construct was much higher than the recommended minimum value of 0.50 (Fornell and Larcker 1981). All items were significantly related to their specified constructs; the data support the convergent validity of the CFA model.

### TABLE 1. Inter-Construct Correlations: Consistency and Reliability Tests

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Mean</th>
<th>S.D.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privacy (1)</td>
<td>4.09</td>
<td>1.03</td>
<td>.885</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IS reactance (2)</td>
<td>3.65</td>
<td>1.16</td>
<td>.403</td>
<td>.810</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>PJC</em> (3)</td>
<td>2.97</td>
<td>0.93</td>
<td>-.353</td>
<td>-.338</td>
<td>.885</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IS sat (4)</td>
<td>4.05</td>
<td>1.16</td>
<td>-.134</td>
<td>-.364</td>
<td>.239</td>
<td>.913</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>PU</em> (6)</td>
<td>4.25</td>
<td>1.20</td>
<td>-.158</td>
<td>-.367</td>
<td>.284</td>
<td>.703</td>
<td>.947</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Team type (7)</td>
<td>-</td>
<td>-</td>
<td>-.036</td>
<td>-.048</td>
<td>.039</td>
<td>-.032</td>
<td>-.067</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender (8)</td>
<td>-</td>
<td>-</td>
<td>-.169</td>
<td>-.092</td>
<td>-.030</td>
<td>-.028</td>
<td>.036</td>
<td>-.103</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IS experience (9)</td>
<td>-</td>
<td>-</td>
<td>.076</td>
<td>.134</td>
<td>-.175</td>
<td>-.081</td>
<td>-.137</td>
<td>-.046</td>
<td>-.221</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (10)</td>
<td>37.3</td>
<td>7.5</td>
<td>.108</td>
<td>.010</td>
<td>-.032</td>
<td>-.015</td>
<td>-.020</td>
<td>.120</td>
<td>-.250</td>
<td>.237</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education (11)</td>
<td>-</td>
<td>-</td>
<td>-.079</td>
<td>.005</td>
<td>-.022</td>
<td>.029</td>
<td>.061</td>
<td>-.089</td>
<td>.124</td>
<td>.095</td>
<td>.258</td>
<td></td>
</tr>
<tr>
<td>Position (12)</td>
<td>-</td>
<td>-</td>
<td>-.083</td>
<td>-.070</td>
<td>.060</td>
<td>.080</td>
<td>.101</td>
<td>-.124</td>
<td>.336</td>
<td>-.357</td>
<td>-.461</td>
<td>-.060</td>
</tr>
</tbody>
</table>
Notes: The bolded numbers on the diagonal are the square root of the variance shared between the constructs and their measures. Off diagonal elements are correlations among constructs.

PJC: Procedural Justice; *PU: perceived usefulness.

Construct (composite) reliability and AVE were estimated and are shown in Table 2. The construct reliability indicates the percent variance in a measurement captured by the trait variance (Bagozzi 1980). The recommended values for establishing a tolerable reliability are above 0.70 (Gefen 2000; Werts et al. 1974) and for strong reliability are above 0.80 (Koufteros 1999). The lowest composite reliability for proposed model was 0.90 and all estimates of AVEs were above 0.7, which provide evidence of the scale’s reliability (Bagozzi 1980; Fornell 1981; Koufteros 1999).

Both confirmatory factor analysis models revealed reasonable model fits and were consistent with other reported research (for Total Model: \( \chi^2 = 1827.536; \) Comparative Fit Index [CFI] = 0.959, Normed Fit Index [NFI] = 0.939, RMSEA = 0.090). RMSEA value of .087 indicate an acceptable fit of the data, according to Browne and Cudeck's (1993) cutoff criteria. This study showed the composite reliability of each construct to exceed the standard for acceptance of 0.7 (see Table 2). The completely standardized path coefficients of the structural model provided an evidence for the hypothesized relationships (see Figure 2). All the direct relationships, except the tested model, were statistically significant at level 0.01, which provides support for the hypotheses of the study.

2 Even thought those values were lower than the cut-off, those items were included in the analysis. Since it is important to retain as many items as possible from the original scale to preserve the integrity of the original research design, as well as the comparability of the results with other studies that used the same scales (Barclay et al. 1995).

3 Root mean square of approximation (RMSEA) is a average fit at lower than 0.10 and at an excellent fit at lower than 0.05 (Browne and Cudeck. 1993)
**Structural Model for Testing for Effect of Privacy Concerns**

In order to test hypotheses 1a and 1b, the effect of privacy concerns on IS effectiveness was analyzed. As shown in Figure 2 (see the values in parenthesis), the result shows that privacy concerns are significantly related to decreasing each perceived usefulness (path=-.243, \( p<0.001 \)) and IS satisfaction (path=-.234, \( p<0.001 \)). In addition, for the hypotheses 2a and 3a, which shows the relationship between privacy concerns and IS reactance and procedural justice, the results indicate privacy concerns positively affect IS reactance (path=.430, \( p<0.001 \)) and negatively affect procedural justice (path=-.414, \( p<0.001 \)). Therefore, hypotheses for the effect of privacy concerns, 1a, 1b, 2a, and 3a were strongly supported.  

![Figure 2. Path Coefficients for Full Model](image)

**Note:** The values in parenthesis are direct coefficients for the privacy concerns on IS effectiveness

\( **P < 0.001; *P < 0.01; *P < 0.05 \)

**Structural Model for Testing Mediated Effects**

In order to examine the mediation role of information systems’ reactance to the relationship between privacy concerns and IS effectiveness factors, the mediated effect was analyzed with two approaches as mentioned in data analysis in Methods section. First, a nested model was created by excluding direct paths from privacy concerns to each IS effectiveness construct in the full model to allow for the presence of both direct and mediated effects for comparing \( \chi^2 \) of two models (see Table 3).

<table>
<thead>
<tr>
<th>Structure</th>
<th>Direct model</th>
<th>Two Mediators Model</th>
<th>Single Mediator Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \chi^2 )</td>
<td>1266.295</td>
<td>1116.85 5</td>
<td>1117.522</td>
</tr>
<tr>
<td>df</td>
<td>425</td>
<td>419</td>
<td>421</td>
</tr>
<tr>
<td>( \chi^2/df )</td>
<td>2.98</td>
<td>2.666</td>
<td>2.654</td>
</tr>
<tr>
<td>NFI</td>
<td>0.948</td>
<td>0.955</td>
<td>0.955</td>
</tr>
<tr>
<td>CFI</td>
<td>0.965</td>
<td>0.971</td>
<td>0.971</td>
</tr>
<tr>
<td>TLI</td>
<td>0.959</td>
<td>0.966</td>
<td>0.966</td>
</tr>
<tr>
<td>RFI</td>
<td>0.94</td>
<td>0.946</td>
<td>0.945</td>
</tr>
<tr>
<td>RMSEA</td>
<td>0.089</td>
<td>0.082</td>
<td>0.081</td>
</tr>
</tbody>
</table>

\( \chi^2 \) of two models (see Table 3).

The direct effects of IS reactance and procedural justice on IS effectiveness (i.e., perceived usefulness and IS satisfaction) were statistically significant in the model (ISR \( \rightarrow \) PU = -.352, \( p<0.001 \); ISR \( \rightarrow \) ISAT = -.347, \( p<0.001 \); PJ \( \rightarrow \) PU = .267, \( p<0.001 \); PJ \( \rightarrow \) ISAT = .218, \( p<0.01 \)).
This nested model was made by constraining direct paths to zero to see whether doing so worsened the fit of the model to the data. The results of the nested-model comparison in Table 3 indicate that the effect of privacy concerns on IS effectiveness and IS satisfaction is completely mediated by two mediators. As shown in Table 3, two mediators (i.e., IS reactance and procedural justice) fully mediated the relationship between privacy concerns and each IS effectiveness factor. The nested model (i.e., the model without direct paths) was not preferred to the full model (i.e., the model with direct paths) including direct paths to IS effectiveness ($\Delta \chi^2 = 0.666, p > 0.1$), implying the presence of mediated effects. Thus, there was no significant difference of $\chi^2$ between the two models.

Further, single mediator models for calculating the effect of each mediator on the model show that both mediators play mediating roles. Table 3 shows that *procedural justice* plays a mediating role in the single model ($\Delta \chi^2 = 0.658, p > 0.1$); it also shows that *information systems reactance* plays a mediating role for the relationship between privacy concerns and IS effectiveness ($\Delta \chi^2 = 2.682, p > 0.1$).

### Table 4. Sobel’s Test Significance of Mediated Paths from Information Privacy to IS Effectiveness

<table>
<thead>
<tr>
<th>Indirect Effect</th>
<th>Row</th>
<th>Mediated Paths</th>
<th>Significant Mediated Paths</th>
<th>Path $^a$</th>
<th>Z stat $^b$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privacy concerns $\rightarrow$ ISR</td>
<td>A</td>
<td>PVC $\rightarrow$ ISR $\rightarrow$ Perceived Usefulness</td>
<td></td>
<td>-0.150</td>
<td>-3.638 $^{***}$</td>
</tr>
<tr>
<td>Privacy concerns $\rightarrow$ PJC</td>
<td>C</td>
<td>PVC $\rightarrow$ ISR $\rightarrow$ IS satisfaction</td>
<td></td>
<td>-0.148</td>
<td>-3.415 $^{***}$</td>
</tr>
<tr>
<td>Privacy concerns $\rightarrow$ PJC</td>
<td>D</td>
<td>PVC $\rightarrow$ PJC $\rightarrow$ Perceived Usefulness</td>
<td></td>
<td>-0.108</td>
<td>-2.299 $^{**}$</td>
</tr>
<tr>
<td>Privacy concerns $\rightarrow$ PJC</td>
<td>D</td>
<td>PVC $\rightarrow$ PJC $\rightarrow$ IS satisfaction</td>
<td></td>
<td>-0.089</td>
<td>-1.867 $^{*}$</td>
</tr>
</tbody>
</table>

$^a$: Standardized path coefficients without direct paths (Indirect path).  
$^b$: Difference values between POS paths and SSE paths  
PVC: privacy concerns, ISR: information systems reactance, PJC: procedural justice,  
$^{***}p<0.001$, $^{**}p<0.01$, $^{*}p<0.05$

In addition, we conducted a Sobel’s test to find specific mediated effects which provides detailed information on the magnitude and significance of individual, indirect paths underlying the overall indirect effect. We calculated the extent to which a construct mediates the relationship between the independent variable and the dependent variable by using the results of SEM analysis (i.e., the magnitudes and the variance of the direct paths among independent variable, mediator, and dependent variable) (Baron and Kenny 1986). The results for the magnitude and significance of specific mediated effects are provided in Table 4. As shown in the table, the negative relationships between privacy concerns and perceived usefulness ($z = -2.62, p < 0.05$) and IS satisfaction ($z = 2.12, p < 0.05$) were statistically mediated by procedural justice. Further, information systems’ reactance also mediated the relationship between privacy concerns and perceived usefulness ($z = -3.92, p < 0.001$) and IS satisfaction ($z = 3.72, p < 0.001$). Based on the two complementary methods of mediated effects, therefore, hypotheses 2b, 2c, 3b, and 3c were strongly supported.

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$^5$ The standard errors are approximated as $\sqrt{\sigma^2 + \sigma^2_\beta + \sigma^2_\alpha + \sigma^2_{\alpha \beta}}$ for a single mediated path, Where, $\sigma^2$ is variance with $j$ denoting $\alpha_j$ and $\beta_j$ path coefficients, $\alpha_i$ and $\beta_i$ are path coefficients with $i$ denoting first and second mediators, and $\sigma_{\alpha \beta}$ is covariance between $\beta_j$ and $\beta_i$ which is adapted from MacKinnon (2000).
Discussion

The purpose of the present study was to explore the impact of privacy concerns (which result from organizations’ control of employees’ information use) on IS effectiveness via two potential motivational mediators, information systems’ reactance and procedural justice. In summary of the major findings, the results showed that both an individual’s perceived procedural justice and systems’ reactance of individuals fully mediated between information privacy concerns and IS effectiveness. This study applied information privacy concerns to an information systems context in organizations and the results showed that two motivational variables mediate the privacy concerns and the information systems effectiveness.

Theoretical Implications

This study has several important implications for theory development and empirical testing. First, the present study extends the theoretical development of information privacy concerns and information systems research by integrating information privacy into the information systems effectiveness in an organizational context. In most organizations, information privacy is one of the key factors affecting organizational performances because employees’ concerns for privacy in using information systems have a crucial role in individual as well as organizational performance. By investigating the effect of information privacy concerns on IS effectiveness, the present study shows the effect of information privacy concerns to an information systems context and ultimately, contributes to the theoretical extension and development of information privacy concerns and information systems research.

Second, we identify the underlying psychological mechanisms in the relationship between information privacy and IS effectiveness by focusing on system users’ cognitive elements, procedural justice, and information systems’ reactance. This study addresses how the negative effects of information privacy concerns mitigate their effect into procedural justice and information systems reactance. Providing a detailed description of the mechanisms among information privacy concerns contributes to a better understanding of the relationship between perceived privacy concerns and the information systems effectiveness. This can be an important cue to the question of why system users show low levels of IS effectiveness concerning information privacy. Based on this argument, we explored individuals’ perceptions about the organization (procedural justice) and users themselves (IS reactance) as two potential mediators of the relationship between information privacy concerns and IS effectiveness, which gives us the answer, in part, of why system users concerning about their privacy information invasion achieve low levels of IS effectiveness.

Third, this study effectively captures multi-dimensional facets of IS effectiveness by applying multiple factors (i.e., perceived usefulness and IS satisfaction). As Thong et al. (1996) mention, using multiple responses from the users can minimize measurement bias. By using multiple factors in estimating IS effectiveness, the current study not only minimizes measurement bias but also delivers detail and specific dimensions about IS effectiveness.

Lastly, this study provides theoretical guidance for future research in examining the effect of information privacy on information systems in organizational contexts. In reality, no comprehensive theoretical framework has been established to guide research on reactions to organizational information systems. This study draws on theory from literatures on both information privacy and the information systems effectiveness to provide guidance for future research. Results of this study suggest that the combination of these literatures is useful in examining employees’ reactions to the development of information systems.

Practical Implications

This study also has important practical and managerial implications. The major findings of the study illustrate that information privacy concerns allow employees to perceive procedural unfairness and/or a psychological reaction about using information systems in workplaces which, in turn, provide negative motivation by inducing low levels of IS effectiveness. Therefore, management should note that IS effectiveness could be coordinated by employees’ perceived procedural justice and information systems’ reactance that is attributed to the privacy concerns.

First of all, to enhance the applicability of such theoretical notions management should provide managers (including security managers) with information on fair privacy policies or programs. In addition, managers need to ensure they behave and structure organizational procedures such that employees believe not only that they are valued but also that they are capable of addressing information systems for their tasks in organizations. Consistent with the
institutional efforts for enhancing employees’ perceived procedural fairness and reducing negative reactance on information systems, top management should clearly advertise the point that the organization cares about implementing fair procedures for each employee and that this is an important mission of the organization. Moreover, it would be vital if top management shows confidence toward their employees’ capabilities in applying information systems to their works. This will facilitate employees’ perceived positive procedural justice and low reactance toward information systems and ultimately, this would lead to positive outcomes of IS effectiveness in workplaces.

**Limitations and Recommendations for Future Research**

The present study has several methodological limitations that need to be considered in future research. First, we did not consider technical factors for IS effectiveness such as information quality, systems quality, or service quality of systems because the primary research focus of the paper is on individuals’ cognitive and psychological factors. However, previous research consistently suggests that technical factors of information systems also contribute to IS effectiveness (Rai et al. 2002; Seddon 1997). Therefore, it would add enormous value if future research identifies both technical factors and psychological factors by integrating technical factors into the current research model. Second, even though the result indicates that two dependent variables are statistically different, the result showed conceptually similar to each other by showing high correlations among those. It may be caused by several reasons. Common method bias and conceptual: this may be violation for principle of parsimony. Third, even if we argue that information privacy and its effectiveness can be generalizable across cultures, it would be a valuable asset if cross-cultural studies were undertaken by future research to investigate the effect of culture on the relationships that may exist. Fourth, there are some factors which should have been controlled for the study. For example, time dependent of monitoring system, how much the staff have been relying on this in the bank.

Despite these limitations, this study contributes to an understanding of the impact of information privacy on IS effectiveness as well as the underpinnings of psychological mechanisms in the relationship between information privacy and IS effectiveness; this study provides both solid empirical results and feasible suggestions for further investigation by showing the effects of two mediators: procedural justice and IS reactance. The results suggest that perceived organizational support and systems self-efficacy of system users facilitated by information privacy act as important predictors for achieving high levels of IS effectiveness. A more elaborate theory and practical solutions should be developed by exhaustive investigation on information privacy and information systems of future research.
REFERENCES


