An expanded model of the factors affecting the acceptance and effectiveness of electronic human resource management systems

Dianna L. Stone [a,*], Kimberly M. Lukaszewski [b,1,2]

[a] Department of Management, College of Business, University of Texas at San Antonio, One UTSA Circle, San Antonio, TX 78249, USA
[b] School of Business, State University of New York at New Paltz, 75 S. Manheim Blvd, New Paltz, NY 12561, USA

ABSTRACT

Despite the widespread use of eHR systems, surveys show that there may be a number of problems associated with their design and implementation. In an effort to overcome these problems we expanded the model of eHR acceptance and effectiveness developed by Stone, Stone-0Romero, & Lukaszewski. The expanded model provides a more detailed discussion of the communication processes underlying these systems including the effects of media and message characteristics. In addition, we offer a number of testable hypotheses based on the model that can be used to guide future research on eHR systems.

© 2009-Elsevier Inc. All rights reserved.

1. Introduction

Technology is having a profound effect on the field human resource management (HR), and propelling it in some entirely new directions. For instance, almost all large organizations use electronic human resource (eHR) systems to attract job applicants (Stone, Lukaszewski, & Isenhour, 2005). In addition, they are increasingly using these systems to deliver training, manage employee performance, and administer compensation and benefit systems (Gueutal & Stone, 2005; Strohmeier, 2007). To date, research has suggested that eHR systems typically increase the efficiency of HR processes, reduce administrative costs, and decrease transaction times (e.g., time to replace employees) (Gueutal & Stone, 2005). However, results of recent surveys show that only 14% of companies report that they have enabled them to make better HR decisions (CedarCrestone, 2007). As a result, there may be problems with the design or implementation of these systems that preclude them from achieving their intended goals (Stone, Stone-Romero, & Lukaszewski, 2003). For instance, electronic HR systems may be less engaging than traditional HR systems, and less likely to capture individuals' attention. Similarly, the messages in electronic systems may lack the richness of face-to-face communication, and prevent individuals from understanding important HR information (e.g., HR rules and procedures, safety guidelines).

In an effort to overcome system-related problems organizations have begun to establish HR metrics or standardized criteria that can be used to assess system effectiveness (Cascio & Boudreau, 2008). Some commonly used HR metrics include: (a) system impact (e.g., new hire quality, turnover of high performers), (b) system effectiveness (e.g., vacancies filled internally, grievances resolved successfully), and (c) system efficiency (e.g., time to fill vacancies) (CedarCrestone, 2007). Although establishing criteria for measuring the success of systems is an important first step, this strategy may not always help organizations enhance system effectiveness. For instance, knowing that new hire quality is low does not show organizations how to improve their e-recruiting practices (Chapman & Webster, 2003; Galanaki, 2002). Thus, we believe that a better understanding of the processes underlying eHR systems may help organizations increase their acceptance and effectiveness.

* Corresponding author. Tel.: +1 210 497 4965.
  E-mail addresses: Diannastone@satx.rr.com (D.L. Stone), Kimade611@hotmail.com (K.M. Lukaszewski).
[1] Tel.: +1 845 257 2661.
[2] We thank Eugene Stone-Romero for his helpful comments on this paper.

Given that the primary goals of eHR systems are to collect, store, and disseminate information about individuals, we developed a model to advance our understanding of the factors affecting system acceptance and effectiveness (Stone, Stone-Romero, & Lukaszewski, 2006). This model argued that eHR systems modify information flows, social interaction patterns, and communication processes. For example, recruiting systems now use websites rather than face-to-face meetings with recruiters to communicate job-related information (Rozelle & Landis, 2002). Similarly, self-service intranet systems are used to convey benefits information rather than traditional meetings with HR professionals (Marler & Dulebohn, 2005). In view of these changes, some research has focused on the overall effectiveness of eHR systems, and has primarily examined changes in recruiting and training processes (Gueutal & Stone, 2005). However, relatively little research has assessed changes in the processes underlying these systems (e.g., changes in communication or social interaction processes) (Stone et al., 2006). Thus, the primary purposes of the present paper are to (a) extend the current model of eHR to highlight the effects of these systems on communication processes (Stone et al., 2006), (b) consider the extent to which changes in communication may affect the acceptance and effectiveness of key eHR processes (e.g., e-recruitment, e-performance management), and (c) offer directions for future research and practice on eHR systems.

Prior to discussing the impact of eHR systems on communication processes, we consider several social psychological models of communication (Hovland, Janis, & Kelley, 1953; Hovland & Janis, 1959; Hovland & Rosenberg, 1960). Then, we use elements in these models to expand the current model of eHR system acceptance and effectiveness (Stone et al., 2006).

1. Communication models

One of the most widely cited models of communication is the Yale Model of Communication and Persuasion developed by Hovland and his associates (e.g., Hovland et al., 1953; Hovland & Janis, 1959). A graphical depiction of the model (Hovland & Janis, 1959) is presented in Fig. 1.
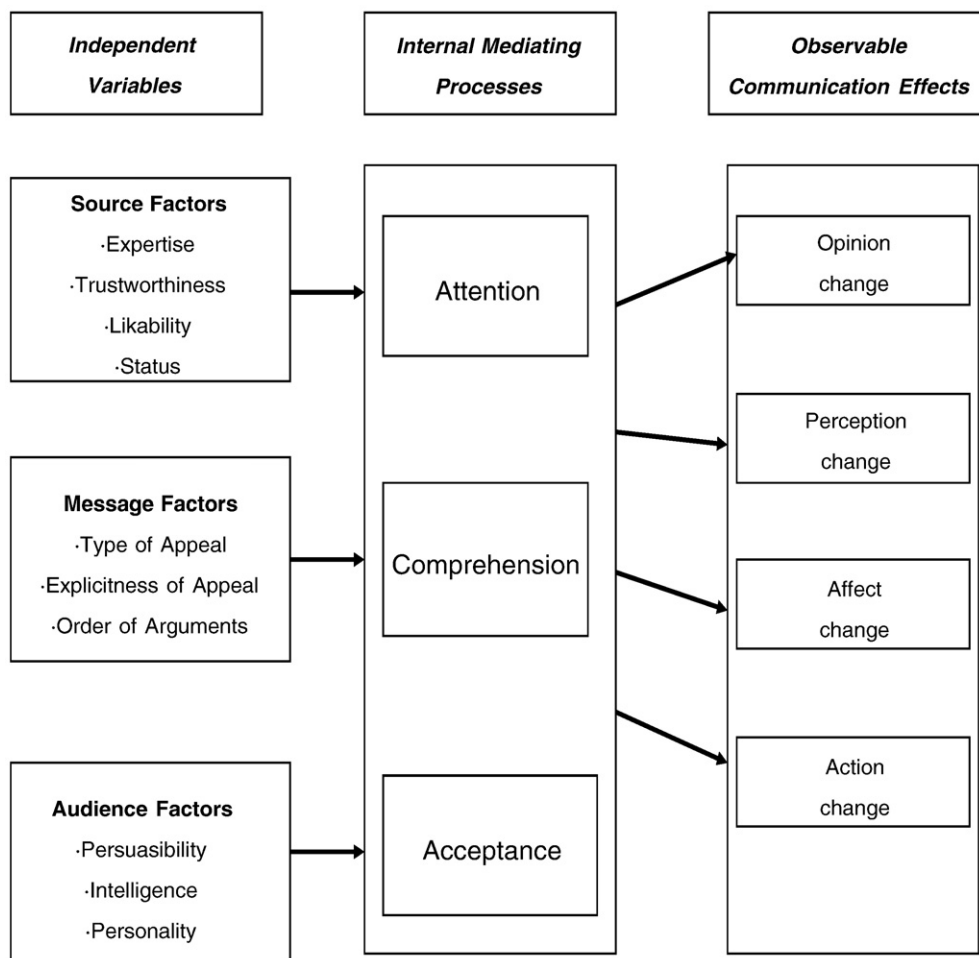

Fig. 1. Yale model of communication and persuasion (based on Janis & Hovland, 1959).

Hovland and his colleagues define communication as the "process by which a communicator transmits stimuli (usually verbal) to modify the attitudes and behaviors of other individuals (audience) (Hovland & Janis, 1959). As can be seen in Fig. 1, the model suggests that three factors influence the degree to which communication influences attitudes and behaviors, (a) source factors, (b) message factors, and (c) audience characteristics. For example, a number of source factors are thought to affect recipients' acceptance of a communication, including the source's level of expertise, trustworthiness, and status (Hovland et al., 1953). In addition, several message factors may influence the effectiveness of the communication process including the order of arguments, the explicitness of requests, and the use of emotional appeals (Hovland, 1957). Furthermore, the model argues that recipient characteristics also affect communication effectiveness (e.g., individuals' persuasibility, intelligence, and personality) (Hovland & Janis, 1959).

Another basic assumption inherent in the model is that the effect of any given communication depends on the extent it influences three mediating processes, (a) attention, (b) comprehension, and (c) acceptance. Thus, for communication to be effective recipients must attend to the information, comprehend what is communicated, and accept it. For instance, individuals may be less likely to attend to communication when sources have low levels of credibility or expertise. Likewise, recipients may be less likely to comprehend or understand a message when the source uses one-way rather than two-way communication. Furthermore, the model suggests that recipients may be less likely to accept a message when it does not capture their attention or enable them to understand the information.

Although this model includes many of the primary factors thought to affect the acceptance of communication, McGuire (1969, 1985) expanded it with his Communication–Persuasion Matrix Model. This model suggests that "attention and comprehension determine the degree to which the recipient will learn from the communicator's message, and the individual's motivation will determine whether he or she accepts or adopts what is learned" (McGuire, 1969). In addition, McGuire's model argues that a person will accept or yield to the information when the persuasive source, message, or context provides incentives (i.e., rewards) for doing so. Thus, McGuire added recipient motivation as a key component in the communication process.

In addition to McGuire's extension of the Yale Communication Model, Petty and Cacioppo (1986) broadened these basic frameworks with their Elaboration Likelihood Model (ELM). This model argues that an individual's motivation and ability to process communication influences his or her cognitive processing. For instance, when individuals are motivated and able to think about the content of the message they engage in high levels of elaboration (i.e., they carefully scrutinize the central features of the issue or message). However, when individuals are not involved or motivated to think about the message they often engage in low levels of elaboration. That is, they examine the message quickly or focus on simple cues or heuristics to help them decide whether to accept it. For example, they rely on the communicator's expertise, physical appearance, or speaking style as the reason for accepting a message.

Given the models noted above, we believe that a better understanding of communication processes should help improve the effectiveness of eHR systems. For instance, it is clear that eHR systems modify the sources of information and the nature of the messages conveyed. As a result, the use of these new systems should affect individuals' attention and comprehension levels. Likewise, these systems should influence the way that individuals process HR information. For example, individuals may be less likely to carefully scrutinize information when it is communicated through electronic systems than traditional face–face systems. Even though our existing model (Stone et al., 2006) argued that eHR systems alter information flows and social interaction processes, it did not provide a detailed explanation of how these systems influence communication processes. Therefore, we consider the impact of these systems on communication processes in the sections that follow. In addition, we use extant models of communication to extend the current model of eHR acceptance and effectiveness.

2. Expanded model of factors affecting the acceptance and effectiveness of eHR systems

As noted above, one of the primary purposes of this paper is to elaborate on the existing model of eHR (Stone et al., 2006), and provide a more detailed discussion of the impact of eHR systems on communication processes. The existing model argues that an organization's values, goals, and resources lead to the development of organizational systems and processes (e.g., eHR systems) that are designed to facilitate goal achievement (Stone et al., 2006). For example, organizations develop systems and processes for (a) attracting talented job applicants, (b) motivating employees to achieve organizational goals, and (c) retaining individuals in their roles. The model also suggests that the nature of organizational systems and processes affects the organization's ability to achieve these and other goals. Similarly, it contends that individuals' values, goals and job-relevant resources (e.g., knowledge, skills, and abilities) serve as important determinants of their intentions and behaviors, including (a) joining and remaining in the organization and (b) helping the organization meet its goals. In addition, the model predicts that a combination of eHR systems and individual factors affect four important processes, (a) information flows, (b) social interaction patterns, (c) perceived control, and (d) system acceptance. In turn, these variables influence the degree to which individuals and organizations achieve their desired outcomes.

Although our existing model suggests that organizational systems influence information flows, the expanded model provides additional details about the influence of these systems on communication processes. For example, the expanded model argues that organizations use eHR systems to communicate HR information (e.g., benefits, HR policies), and influence individuals' attitudes and behaviors (e.g., attitudes toward jobs and organizations). In addition, it contends that eHR systems change the nature of the communication media and message characteristics. Furthermore, these factors coupled with recipient characteristics influence individuals' attention, comprehension, and attitudes. Finally, the model predicts that the purpose of the communication moderates the relations between (a) media characteristics, (b) message factors, and (c) system acceptance and effectiveness.

3. Communication media

Our expanded model suggests that the use of eHR systems alters the media used to communicate HR information. For example, eHR systems often use electronic media rather than face-to-face interactions to convey HR information. Electronic media typically include all media that provide information through the use of computer technology (e.g., the Internet, intranets, emails, websites, teleconferencing, videoconferencing, and chat rooms) (Siegel, Dubrovsky, Kiesler, & McGuire, 1986). It also permits access to information without the individual having to be in the same location at the same time.

Interestingly, research on the use of electronic media, or what some researchers label as computer-mediated communication (CMC), has shown that it is fast, flexible, and allows for the efficient exchange of information (Siegel et al., 1986). It also enables large numbers of individuals to receive information at the same time. Despite these benefits, research indicates that electronic media are viewed as highly impersonal, and lack the richness of face-to-face communication (Hinds & Kiesler, 1995; Kiesler, Siegel, & McGuire, 1984; Siegel et al., 1986). Information richness is typically defined as the information carrying capacity of the communication medium (Daft & Lengel, 1984). For instance, research shows that electronic media lack the social, visual, and aural cues provided by face-to-face media (Kiesler et al., 1984; Siegel et al., 1986). In addition, the use of electronic media does not always allow for interaction between sender and receiver, and may not enable receivers to clarify the meaning of messages (Kiesler et al., 1984). For instance, in traditional forms of communication head nods, smiles, eye contact, tone of voice and other non-verbal behaviors give senders and receivers information they can use to regulate the exchange of information (Kiesler et al., 1984). However, electronic media do not typically convey these non-verbal and paraverbal behaviors. Thus, researchers have argued that electronic media may decrease the salience of information, and individuals' involvement in the communication process (Hinds & Kiesler, 1995). Similarly, Kiesler and her colleagues contend that electronic media often have less influence on recipients than traditional forms of communication (Kiesler et al., 1984).

3.1. Influence of media on individuals' attention and comprehension

Given the findings noted above, our expanded model suggests that eHR systems should be less likely to capture individuals' attention than traditional face-to-face systems. In addition, consistent with the ELM (Petty & Cacioppo, 1986) individuals may be less likely to carefully scrutinize the content of messages conveyed by eHR than traditional HR systems. As a result, employees may not take advantage of the HR opportunities offered by the organization (e.g., benefits, advancement opportunities), and electronic systems may not always help organizations attract and retain talented employees. Indirect support for these arguments is provided by research that shows individuals react more favorably to human beings than inanimate objects (e.g., computers) (Sears, 1987). Similarly research indicates that most employees prefer face-to-face instruction to online training (Phillips, Phillips, & Zuniga, 2000). In addition, results of research by Tybout and Artz (1994) show that job applicants are more attracted to organizations when messages are presented through face-to-face media rather than electronic media. However, contrary to these findings, some research by Burke and Chidambaram (1999) indicates that individuals do not always view face-to-face groups as more effective than electronically linked groups.

Our expanded model also suggests that individuals may be less likely to understand HR information provided through electronic media than face-to-face media. The primary reason for this is that electronic systems offer fewer opportunities for individuals to ask questions or clarify the meaning of messages than traditional systems (Cardy and Miller, 2005). For instance, when organizations use electronic media to convey performance feedback employees may be less likely to understand the message because it is not coupled with a supervisor's non-verbal behaviors (e.g., smiles, supportive tone of voice). As a result, individuals should be less likely to change their behavior in response to electronic than face-to-face performance feedback. Although some research has focused on the effectiveness of electronic media, to our knowledge no research has examined the extent to which eHR systems influence individuals' attention and comprehension levels. Thus, we offer the following hypotheses to guide research.

H1. Individuals will be less likely to (a) attend to or (b) understand the information provided by eHR systems than face-to-face HR systems.

3.2. Influence of media on individuals' attitudes

Apart from the impact of electronic media on individuals' attention and comprehension, our model suggests that these media may also affect individuals' attitudes (e.g., attitudes toward HR systems or the organization). One reason for this is that the use of electronic media may convey the impression that the organization is more concerned with cost savings or efficiency than people. As a result, individuals may develop more negative attitudes toward electronic systems and the organization because they feel that the organization does not care about their well-being. Furthermore, these attitudes should influence individuals' behavioral intentions and subsequent behaviors. For instance, they may be less likely to apply for jobs or promotions when electronic systems are used compared to traditional HR systems. Indirect support for these arguments is provided by research on e-recruiting (e.g., Braddy, Meade, Michael, & Fleenor, 2008, Cober, Brown, Keeping, & Levy, 2004) that suggests that website characteristics influence applicants' impressions of the organization.

Even though there has been some research on the effects of e-recruiting and e-selection systems on impressions of organizations (Braddy et al., 2008; Williamson, Lepak, & King, 2003) to our knowledge no research has examined the impact of all types of eHR systems on individuals' attitudes. Therefore, we make the following predictions.

H2. The use of electronic HR systems will result in less positive attitudes toward the (a) system, and (b) the organization than the use of face-to-face HR systems.

In the sections above, we argued that the use of electronic media may affect individuals' attention, comprehension, and attitudes toward the organization. However, our expanded model also suggests that the use of these media may affect the nature of the message conveyed. Thus, in the sections below we consider the impact of eHR systems on a number of message characteristics.

4. Message characteristics

Our expanded model argues that the acceptance and effectiveness of eHR systems may depend on characteristics of the media and the attributes of the message conveyed. For example, these new systems often change a number of message characteristics including the personalization and richness of the message. They should also influence the degree to which messages provide one-way versus two-way communication. Each of these message characteristics will be considered in the paragraphs that follow. It merits noting that although these message attributes are discussed separately they may not be completely independent from one another.

4.1. Personalization

One message factor that may be affected by the use of electronic media is personalization. Personalized communication is typically defined as communication that is tailored to the needs of individuals, and intended to create a sense of social presence or feeling of being in a social relationship with an on screen agent (Reeves & Nass, 1996). Quite simply, messages communicated by electronic media are often viewed as more impersonal than information conveyed by traditional face-to-face media. As a result, our expanded model argues that the personalization of the message should influence individuals' attention, comprehension and attitudes. One reason for this is that messages communicated by human beings are likely to be viewed as more sincere or trustworthy than those conveyed by inanimate objects (e.g., computers, voice response systems) (Beniger, 1987). Another reason is that individuals typically perceive that human beings are more similar and likeable than nonliving objects (Sears, 1987). A final reason is that personal messages are more likely to engage recipients in the communication process than impersonal messages because they relay implicit concern for the individual. In contrast, impersonal messages are often viewed as detached and disinterested in the well-being of individuals. Given these arguments, we consider the impact of the personalization of messages on attention, comprehension, and attitudes below.

4.2. Influence of personalized messages on individuals' attention and comprehension

Although we argued that eHR systems provide more impersonal messages than traditional systems, it merits noting that these systems vary in the degree to which they provide personalized information. For example, some recruiting websites use only impersonal messages (e.g., written text) to convey information about the organization. However, others include more personalized messages that are designed to convey employees' beliefs and attitudes about what it is like to work for the organization. For instance, some websites use (a) pictures of employees, (b) video-based testimonials, or (c) chat rooms to convey personalized information. Still other eHR systems enhance the personalization of messages by customizing or tailoring information to specific job applicants or employees (Cappelli, 2001; Dineen, Ash, & Noe, 2002; Dineen, Ling, Ash, & DelVecchio, 2007). For example, organizations now use customized systems to identify employees who are qualified for promotions, and send personal messages encouraging them to apply for advancement opportunities.

Consistent with the arguments noted above, we believe that the personalization of messages should have a positive impact on the degree to which eHR systems engage individuals and capture their attention. In addition, it can be argued that individuals' attention levels should be positively related to their understanding of the information. In support of these arguments, research in marketing shows that customers are more likely to be influenced by customized advertisements than those that are not customized (Tam & Ho, 2005). Although some research has focused on the use of personalized messages in e-recruiting and e-marketing, to our knowledge research has not considered the extent to which the personalization of messages influences individuals' attention and comprehension levels. Therefore, we offer the following hypotheses.

H3. The use of personalized messages in eHR systems will be positively related to individuals' (a) attention, and (b) comprehension of HR information.

4.3. Influence of personalized messages on individuals' attitudes

Apart from the impact of personalized messages on individuals' attention and comprehension levels, our expanded model also suggests that personalized messages will affect individuals' attitudes toward the system and the organization. For instance, the use of impersonal messages is likely to convey the impression that the organization cares more about efficiency than employees. As a result, the use of impersonal messages in eHR systems is likely to have a negative impact on individuals' attitudes. These attitudes should also influence individuals' behavioral intentions and subsequent behaviors (e.g., application for jobs).

Support for these arguments is provided by research on e-recruiting that revealed the use of personalized messages on websites may influence individuals' attraction to organization (Dineen et al., 2002). In particular, research by Dineen et al. (2002) found that individuals are more attracted to organizations when the organization provides personally relevant environmental cues suggesting a high similarity between organizational and individual values than when they do not. Similarly, results of research by Thoms, Chinn, Goodrich, and Howard (2004) indicated that including photographs on websites increased applicants' ratings of the personableness and informativeness of the website. Furthermore, research by Braddy et al. (2008) suggested that website features often provide signals about the organization's culture and climate. For example, culturally relevant pictures and employee testimonials communicate information about the organization's diversity, attention to-detail, supportiveness, and team-orientation. In addition, employee testimonials and policies relay information about the organization's decisiveness and reward systems. Moreover, research in marketing has shown that the use of customized advertisements is positively related to consumers' attitudes toward products (Tam & Ho, 2005).

Despite the results of the studies noted above, research has also shown that some types of personalized messages are more credible than others. For instance, research by Van Hoye and Lievens (2007) indicated that applicants felt that personalized messages in blogs and chatrooms were more credible than employees' testimonials on company websites. The reason for this is that blogs and chatrooms are viewed as independent of the organization whereas testimonials on websites are not. Even though some research has focused on the use of personalized messages in e-recruiting and e-marketing, relatively little research has examined the effectiveness of personalized message in all types of eHR systems. Therefore, we make the following predictions to guide research future research.

H4. The personalization of messages in eHR systems will be positively related to individuals' attitudes toward the (a) HR system, and (b) organization.

4.4. Information richness

Another message characteristic that may be affected by the use of eHR systems is information richness. For example, electronic media typically convey information that lacks richness because the sender is not present, and there is little ongoing feedback (Johns & Saks, 2005). In addition, these types of media do not always include the social cues inherent in face-to-face communication (Kiesler et al., 1984). In contrast, face-to-face media usually convey information that is high in richness because it includes non-verbal behaviors in the form of head nods, smiles, eye contact, tone of voice, or personal demeanor (Kiesler et al., 1984). Although research shows that electronic media typically lack information richness, it merits emphasis that different forms of electronic media vary in terms of this message characteristic. For instance, researchers contend that face-to-face media provide the richest levels of information followed by videoconferencing, teleconferencing, chat-rooms, email, and textual information (Baltes, Dickson, Sherman, Bauer, & LaGanke, 2002). In particular, face-to-face interactions and videoconferencing provide fairly rich information because they include audio, visual and non-verbal cues (Baltes et al., 2002). However, email messages convey information that is low in richness because they do not include these important cues. Given the variability in eHR systems, our expanded model argues that the level of information richness should have an important impact on individuals' attention, comprehension, and attitudes.

4.5. Influence of information richness of individuals' attention and comprehension

Our expanded model suggests that when information is low in richness it should be less likely to attract individuals' attention or help them understand a message than when it is high in richness. In support of these arguments, research by Kiesler et al. (1984) has shown that social cues are important in the communication process because they are used to regulate social exchanges (Kiesler et al., 1984). In addition, the use of contextual cues and social information increases individuals' involvement in the communication process and enables them to gain a better understanding of the message content (Sproull & Kiesler, 1986). Furthermore, Daft and Lengel (1986) argue that the lack of information richness often results in the oversimplification of complex topics, and prevents individuals from gaining insight about a message.

Interestingly, research in management information systems has examined the effects of information richness on managers' decision making and choice of media (Dennis, Fuller, & Valacich, 2008). However, results of this research have been inconsistent, and have not focused on individuals' attention or comprehension levels. Therefore, we believe that additional research is needed to assess the influence of information richness on individuals' reactions to these systems. In an effort to foster this research we offer the following hypotheses.

H5. The level of information richness in eHR systems will be positively related to individuals' (a) attention and (b) comprehension of HR information.

4.6. Influence of information richness on individuals' attitudes

Our expanded model also suggests that the level of information richness in an eHR system should influence individuals' attitudes and subsequent behaviors. The primary reason for this is that individuals may become frustrated when information in these systems lack richness. For example, employees may feel that electronic systems do not provide enough information to help them make decisions about job opportunities or benefits. Likewise electronic performance feedback systems may not convey information that is rich enough to help individuals gain insight about performance problems (Ensher, Nielson, & Grant-Vallone,

2002). Furthermore, e-performance management systems may not always give individuals the opportunity to express their feelings or concerns about performance ratings. Given that the opportunity to express concerns may affect individuals' reactions to performance appraisals, the use of online performance appraisal systems may be perceived as less fair than traditional face-to-face systems (Landy, Barnes-Farrell, & Cleveland, 1980).

In view of the fact that information in HR systems is often tied to outcomes in organizations (e.g., performance appraisals are typically linked to pay raises) individuals may develop negative attitudes toward systems that interfere with their ability to gain valued outcomes. For example, individuals may react negatively to eHR systems when they do not provide the information needed to help them improve their performance or obtain benefits. In spite of these arguments, we know of no research that has examined the impact of the richness of eHR information on individuals' attitudes. Therefore, the following hypotheses are presented:

H6. The level of information richness in eHR systems will be positively related to individuals' attitudes toward the (a) system, and (b) organization.

4.7. One-way versus two-way communication

Apart from the message characteristics considered above, eHR systems should also affect the degree to which one-way rather than two-way communication is provided. For instance, when one-way communication is used information flows from sender to recipient, but individuals have no means of clarifying the information. In contrast, when two-way communication is used information can flow back and forth between the original sender and receiver. In addition, the receiver can ask questions or provide feedback to the sender to ensure he or she understands the information. Not surprisingly, research shows that two-way communication systems are typically more effective than one-way systems (Leavitt & Mueller, 1951).

Although eHR systems vary, most of them use one-way rather than two-way communication to convey HR-related information. For example, most large companies use Internet systems to communicate information about job opportunities, or intranet systems to convey information about benefits. However, these systems do not always provide a means for applicants or employees to ask questions or clarify the information (Feldman & Klaas, 2002; Straus et al., 1998). As a result, our expanded model suggests that the use of one-way communication in eHR systems may influence individuals' attention, comprehension, and attitudes.

4.8. Influence of one way communication on individuals' attention and comprehension

As noted above, our expanded model argues that the use of one-way communication in eHR systems will have a negative impact on individuals' attention and comprehension levels. In support of these arguments, Daft and Lengel (1986) contend that feedback is critical for effective communication because it helps individuals reduce ambiguity and process complex messages. Furthermore, the lack of feedback may interfere with the communication process because it prevents individuals from understanding or gaining insight about a message. Similarly, research by Hinds and Kiesler (1995) argues that synchronicity influences the effectiveness of computer-mediated communication. Synchronicity refers to the degree to which people can communicate at the same point in time (Hinds & Kiesler, 1995), and engage in two-way communication. For example, telephonic communication and chat rooms typically have more synchronicity than voice mail or email. Research shows that synchronicity permits a great amount of information to be exchanged, and provides for ongoing feedback that enables individuals to fill in details or correct misunderstandings (Hinds & Kiesler, 1995). However, asynchronous communication often impedes an individual's ability to comprehend information. Interestingly, some recruiting websites have begun to use two-way communication systems (e.g., chat rooms, instant messaging) to give applicants the opportunity to communicate with HR professionals. Even though we believe that this strategy may improve the communication process, we know of no research on its effectiveness. Therefore, we believe that additional research is needed to examine the impact of one-way or two-way communication on individuals' attention and comprehension levels. As a result, we make the following predictions.

H7. eHR systems that use one-way communication processes will be less likely to affect individuals' (a) attention, and (b) comprehension than those that use two-way communication.

4.9. Influence of one-way communication on individuals' attitudes

Our expanded model also argues that the use of one-way communication in eHR systems should be negatively related to individuals' attitudes toward the system and organization. For instance, when one-way communication is used individuals may become irritated when they are not able to ask questions or clarify the meaning of messages. Thus, they may develop more negative attitudes toward the organization and the system than when two-way communication is used. Furthermore, these attitudes are likely to influence individuals' behaviors (e.g., they may be less likely to apply for jobs or take advantage of benefit opportunities). Despite these arguments, we know of no research that has assessed the effects of one-way versus two-way communication processes on attitudes toward eHR systems. Therefore, we propose the following hypotheses.

H8. The use of one-way communication processes in eHR systems will be negatively related to individuals' attitudes toward the (a) system and (b) organization.

5. Purpose of communication

Our expanded model also suggests that the effectiveness of varying media and message characteristics may depend on the purpose of the communication. As should be clear from our discussion above HR information is disseminated for a variety of different purposes. For example, it is used to convey basic HR information including job requirements, rules, regulations, and benefits. However, it is also used to influence individuals' attitudes and motivate behaviors (e.g., motivate individuals to apply for jobs or modify their performance levels). Therefore, we believe that different types of media and message characteristics may be needed for different purposes. For instance, if messages are used to convey basic information about HR rules and procedures then the use of electronic media may be adequate. However, if messages are designed to influence individuals' attitudes and behaviors then organizations may need to use face-to-face or multiple media to achieve these goals. Thus, our expanded model argues that the purpose of the communication should moderate the relations between (a) media or (b) message characteristics, and (c) individuals' attention, comprehension, and attitudes.

5.1. Moderating effects of purpose of the communication

As noted above, our expanded model argues that the effectiveness of media and message characteristics may depend on the purpose of the communication. For instance, the use of personalized messages may be more important when the purpose is to modify individuals' attitudes or motivate behaviors (e.g., job applications) than convey basic HR information. Likewise, the use of rich information may be more critical when the organization needs to explain complex information or change individuals' attitudes than when it needs to communicate basic information.

In support of these arguments Daft and Lengel (1984) maintain that the need for rich information depends on complexity of the situation. Information high in richness is needed when the situation is complex, but information low in richness may be sufficient for simple situations. Similarly, Kiesler et al. (1984) contend that rich information is necessary when the decision is important or requires individuals to change their attitudes. Furthermore, Dennis and Kinney (1998) suggest that communication will be improved when the message characteristics are aligned with the information needs of the situation. For instance, messages high in information richness are needed when tasks involve multiple interpretations, but messages low in richness may be adequate when tasks are well defined. Similarly, Dennis et al. (2008) argue that matching message synchronicity to the requirements of the task enhances communication effectiveness. Thus, we believe that the use of two-way communication may be more important when the purpose is to modify individuals' attitudes than convey basic HR information.

Although these arguments seem plausible, it merits noting that little empirical research has examined the degree to which the purpose of the communication moderates the relations between message characteristics and individuals' reactions (Dennis et al., 2008). Thus, we make the following predictions to foster additional research.

H9. The purpose of the communication will moderate the relations between media characteristics and individuals' (a) attention, (b) comprehension, and (c) attitudes.

H10. The purpose of the communication will moderate the relations between the personalization of the message and individuals' (a) attention, (b) comprehension, and (c) attitudes.

H11. The purpose of the communication will moderate the relations between the richness of the message and individuals' (a) attention, (b) comprehension, and (c) attitudes.

H12. The purpose of the communication will moderate the relations between the use of one-way messages and individuals' (a) attention, (b) comprehension, and (c) attitudes.

In summary our expanded model of eHR acceptance and effectiveness suggests that these systems change communication processes including media and message characteristics. Furthermore, these characteristics are thought to affect individuals' attention, comprehension, and attitudes toward the system and the organization. In addition, our model argues that the purpose of the communication moderates the relation between (a) media characteristics, (b) message characteristics, and (c) individuals' reactions to these systems. Given our expanded model, we consider its implications for future research and practice in the sections that follow.

6. Implications for future research and practice

We believe that the expanded model of eHR acceptance and effectiveness has important implications for future research and practice. For instance, much of the existing research on eHR systems has focused on e-recruiting (Stone et al., 2005) or e-learning (Salas, DeRoun, Littrell, 2005). In addition, most of the research has been atheoretical, and has not examined the psychological processes underlying these systems. However, our expanded model includes a more detailed discussion of the impact of eHR systems on these processes. Thus, we believe that it provides a much clearer understanding of the factors affecting eHR system acceptance and effectiveness. Furthermore, we hope that it will serve as a framework, and stimulate interest in research on eHR systems.

Apart from the implications for future research, we believe that our model has key implications for overcoming eHR system-related problems and increasing their effectiveness. For instance, our model suggests that HR professionals should consider the

extent to which these systems are engaging. In particular, we believe that electronic systems should be designed to capture individuals' attention and ensure they understand HR information. If they do not gain individuals' attention or enhance comprehension levels they will not achieve their intended goals. Furthermore, HR professionals should consider the degree to which the use of (a) personalized messages, (b) rich information, and (c) two-way communication influences the acceptance and effectiveness of these systems.

In addition, our model suggests that different types of media may be more effective for some purposes than others. For instance, electronic media may be sufficient for communicating basic HR rules and regulations, but may not be satisfactory for motivating individuals to take advantage of HR opportunities. Thus, organizations should consider using face-to-face or multiple media if they are concerned with modifying individuals' attitudes or motivating their behaviors. Similarly, the effectiveness of different message characteristics may depend on the purpose of the communication. For example, organizations may need to personalize information if they want to change attitudes or motivate individuals to apply for jobs or promotion opportunities. However, the use of personalized messages may be less important when the purpose is to communicate basic HR rules and procedures. Although these suggestions seem plausible, we caution that research is needed to examine their effectiveness before they are implemented in organizations.

7. Conclusion

Despite the widespread use of eHR systems, surveys show that only 14% of organizations report that they have helped them make better HR decisions (CedarCrestone, 2007). Thus, there may be a number of problems associated with the design and implementation of these systems. In an effort to overcome these problems we expanded the model of eHR acceptance and effectiveness developed by Stone et al. (2006). Our expanded model incorporated a more detailed discussion of communication processes including the effects of media and message characteristics on individuals' attention, comprehension, and attitudes. In addition, we offered a number of testable hypotheses based on the model that can be used to guide future research on eHR systems.

We hope that our expanded model generates increased interest in research on eHR systems. Furthermore, we believe that it should help organizations develop new systems that meet their needs, and those of their potential and actual employees.

References

Baltes, B. B., Dickson, M. W., Sherman, M. P., Bauer, C. C., & LaGanke, J. S. (2002). Computer-mediated communication and group decision making: A meta-analysis. *Organizational Behavior and Human Decision Process*, *87*, 156–179.
Beniger, J. (1987). Personalization of mass media and the growth of pseudo-community. *Communication Research*, *14*, 352–371.
Braddy, P.W., Meade, A.W., Michael, J.J., & Fleenor, J.W. (2008). Internet recruiting: Effects of website features on organizational culture. Paper presented at the 23rd annual conference society of industrial and organizational psychology, San Francisco, CA.
Burke, K., & Chidambaram, L. (1999). How much bandwidth is enough? A longitudinal examination of media characteristics and group outcomes. *MIS Quarterly*, *23*, 557–580.
Cappelli, P. (2001). Making the most of on-line recruiting. *Harvard Business Review*, *79*, 139–146.
Cardy, R. L., & Miller, J. S. (2005). eHR and performance management: A consideration of positive potential and the dark side. In H. G. Gueutal & D. L. Stone (Eds.), *The brave new world of eHR: Human resources management in the digital age* (pp. 138–165). San Francisco: Jossey Bass.
Cascio, W.F., & Boudreau, J.W. (2008). Investing in people: Financial impact of human resource initiatives. Upper Saddle River, NJ: Financial Times: Pearson Education.
CedarCrestone (2007). *CedarCrestone 2007–2008 HR systems survey: HR technologies, service delivery approaches, and metrics.* Available at www.cedarcrestone.com/research.php. Retrieved July, 2008.
Chapman, D. S., & Webster, J. (2003). The use of technologies in the recruiting, screening, and selection processes for job candidates. *International Journal of Selection and Assessment*, *11*, 113–120.
Cober, R. T., Brown, D. J., Keeping, L. M., & Levy, P. E. (2004). Recruitment on the net: How do organizational web site characteristics influence applicant attraction? *Journal of Management*, *30*, 623–646.
Daft, R. L., & Lengel, R. H. (1984). Information richness: A new approach to managerial behavior and organization design. *Research in Organizational Behavior*, *6*, 191–233.
Daft, R. L., & Lengel, R. H. (1986). Organizational information requirements, media richness, and structural design. *Management Science*, *32*, 554–571.
Dennis, A. R., Fuller, R. M., & Valacich, J. S. (2008). Media, tasks, and communication processes: A theory of media synchronicity. *MIS Quarterly*, *32*, 575–600.
Dennis, A. R., & Kinney, S. T. (1998). Testing media richness theory in the new media: The effects of cues, feedback, and task equivocality. *Information Systems Research*, *9*, 256–274.
Dineen, B. R., Ash, S. R., & Noe, R. A. (2002). A web of applicant attraction: Person-organization fit in the context of web-based recruitment. *Journal of Applied Psychology*, *87*, 723–734.
Dineen, B. R., Ling, J., Ash, S. R., & DelVecchio, D. (2007). Aesthetic properties and message customization: Navigating the dark side of web recruitment. *Journal of Applied Psychology*, *92*, 356–372.
Ensher, E. A., Nielson, T. R., & Grant-Vallone, E. (2002). Tales from the hiring line: Effects of the internet and technology on HR processes. *Organizational Dynamics*, *31*, 224–244.
Feldman, D. C., & Klaas, B. S. (2002). Internet job hunting: A field study of applicant experiences with on-line recruiting. *Human Resource Management*, *41*, 175–192.
Galanaki, E. (2002). The decision to recruit online: A descriptive study. *Career Development International*, *7*, 243–251.
Gueutal, H. G., & Stone, D. L. (Eds.). (2005). *The brave new world of eHR: Human resources management in the digital age* San Francisco, CA: Jossey-Bass.
Hinds, P., & Kiesler, S. (1995). Communication across boundaries: Work, structure, and use of communication technologies in a large organization. *Organization Science*, *6*, 373–393.
Hovland, C. I. (1957). *Order of presentation in persuasion.* New Haven, CT: Yale University.
Hovland, C. I., Janis, I. L., & Kelley, H. H. (1953). *Communication and persuasion: Psychological studies of opinion change.* New Haven, CT: Yale University Press.
Hovland, C. I., & Janis, I. L. (1959). *Personality and persuasibility.* New Haven, CT: Yale University Press.
Hovland, C. I., & Rosenberg, M. J. (1960). *Attitude organization and change.* New Haven, CT: Yale University Press.
Johns, G., & Saks, A. M. (2005). *Organizational behaviour: Understanding and managing life at work*, 6th ed. Toronto, Canada: Pearson Prentice Hall.
Kiesler, S., Siegel, J., & McGuire, T. W. (1984). Social psychological aspects of computer-mediated communication. *American Psychologist*, *39*, 1124–1134.
Landy, F. J., Barnes-Farrell, J., & Cleveland, J. N. (1980). Perceived fairness and accuracy of performance evaluation: A follow-up. *Journal of Applied Psychology*, *65*, 355–356.

Leavitt, H. J., & Mueller, R. A. (1951). Some effects of feedback on communication. *Human Relations*, *4*(1951), 401−410.

Marler, J. H., & Dulebohn, J. H. (2005). A model of employee self-service technology acceptance. In J. J. Martocchio (Ed.), *Research in personnel and human resource management, Vol. 24*. (pp. 139−182) Greenwich, CT: JAI.

McGuire, W. J. (1969). The nature of attitudes and attitude change. In G. Lindzey & E. Aronson (Eds.), 2nd ed. *The handbook of social psychology, Vol. 3*. (pp. 136−314) Reading, MA: Addison Wesley.

McGuire, W. J. (1985). Attitudes and attitude change. In G. Lindzey & E. Aronson (Eds.), 3rd ed. *The handbook of social psychology, Vol. 2*. (pp. 223−346)New York: Random House.

Petty, R. E., & Cacioppo, J. T. (1986). The elaboration likelihood model of persuasion. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (pp. 123−205). New York: Academic Press.

Phillips, J. J., Phillips, P. P., & Zuniga, L. (2000). *Evaluating the effectiveness and the return on investment of e-learning.* Alexandria, VA: American Society for Training and Development.

Reeves, B., & Nass, C. (1996). *The media equation: How people treat computers, television, and new media like real people and places.* New York: Cambridge University Press.

Rozelle, A. L., & Landis, R. S. (2002). An examination of the relationship between use of the Internet as a recruitment source and student attitudes. *Computers in Human Behavior*, *18*, 593−604.

Salas, E., DeRoun, R. E., & Littrell, L. N. (2005). Research-based guidelines for designing distance learning: What we know so far. In H. G. Gueutal & D. L. Stone (Eds.), *The brave new world of eHR* (pp. 104−137). San Francisco, CA: Jossey-Bass.

Sears, D. O. (1987). The person-positivity bias. *Journal of Personality and Social Psychology*, *44*, 233−250.

Siegel, J., Dubrovsky, V., Kiesler, S., & McGuire, T. W. (1986). Group processes in computer-mediated communication. *Organizational Behavior and Human Decision Processes*, *37*, 157−187.

Sproull, L., & Kiesler, S. (1986). Reducing social context cues: Electronic mail in organizational communication. *Management Science*, *32*, 1492−1512.

Stone, D. L., Lukaszewski, K. M., & Isenhour, L. (2005). E-recruiting: Online strategies for attracting talent. In H. G. Gueutal & D. L. Stone (Eds.), *The brave new world of eHR* (pp. 22−53). San Francisco, CA: Jossey-Bass.

Stone, D. L., Stone-Romero, E. F., & Lukaszewski, K. (2003). The functional and dysfunctional consequences of human resource information technology for organizations and their employees. In D. Stone (Ed.), *Advances in human performance and cognitive engineering research* (pp. 37−68). Greenwich, CT: JAI Press.

Stone, D. L., Stone-Romero, E. F., & Lukaszewski, K. (2006). Factors affecting the acceptance and effectiveness of electronic human resource systems. *Human Resources Management Review*, *16*, 229−244.

Straus, S. G., Weisband, S. P., & Wilson, J. M. (1998). Human resource management practices in the networked organization: Impacts of electronic communication systems. In C. L. Cooper & D. M. Rosseau (Eds.), *Trends in organizational behavior* (p. 127−154). New York: Wiley.

Strohmeier, S. (2007). Research in e-HRM: Review and implications. *Human Resource Management Review*, *17*, 19−37.

Tam, K. Y., & Ho, S. Y. (2005). Web personalization as a persuasion strategy: An elaboration likelihood model perspective. *Information Systems Research*, *16*, 271−291.

Thoms, P., Chinn, S. J., Goodrich, J., & Howard, G. (2004). Designing personable and informative job recruiting web sites: Testing the effect of the design on attractiveness and intent to apply. *Psychological Reports*, *94*, 1031−1042.

Tybout, A. M., & Artz, N. (1994). Consumer psychology. In M. R. Rosenzweig & L. W. Porter (Eds.), *Annual review of psychology, Vol. 45*. (pp. 131−169)Palo Alto, CA: Annual Reviews Inc.

Van Hoye, G., & Lievens, F. (2007). Investigating web-based recruitment sources: Employee testimonials vs. word-of-mouse. *International Journal of Selection and Assessment*, *15*, 372−382.

Williamson, I. O., Lepak, D. P., & King, J. (2003). The effect of company recruitment web site orientation on individuals' perceptions of organizational attractiveness. *Journal of Vocational Behavior*, *63*, 242−263.