

PERCEIVED FAIRNESS OF WEB-BASED APPLICANT SCREENING PROCEDURES: WEIGHING THE RULES OF JUSTICE AND THE ROLE OF INDIVIDUAL DIFFERENCES

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Four previously established characteristics of procedural justice (consistency, opportunity to perform, reconsideration opportunity, and feedback timeliness) and one additional characteristic (automated versus human decision agent) were manipulated in a policy-capturing design to examine their relative importance in predicting fairness perceptions in a Web-based applicant-screening context. Results showed that all five justice characteristics influenced fairness perceptions and that a hierarchy of importance among the characteristics existed, with consistency weighted most heavily, followed by opportunity to perform. Gender, conscientiousness, and job application experience moderated the effects of several of these characteristics in predicting fairness perceptions. Implications and future research directions are discussed. © 2004 Wiley Periodicals, Inc.

Introduction

Researchers have increasingly recognized the importance of applicant perceptions during the selection process and have investigated fairness perceptions related to applicant selection systems in particular (e.g., Ryan & Ployhart, 2000; Rynes, 1993; Steiner & Gilliland, 1996). Applicant screening is the first stage of a selection process, and applicant screening systems refer to procedures organizations use to reduce applicant pools prior to contacting individuals for further employment consideration. In particular,

such systems typically involve evaluating applications or résumés and deciding whether applicants will be invited to continue in the selection process. Because the screening process determines which applicants will continue in the selection process, it is natural that applicants are concerned about the fairness of the procedures used. Given this concern, and given the fact that most selection-fairness research has focused on stages of the selection process that occur after an initial screening procedure (e.g., interviews, ability tests; Steiner & Gilliland, 1996), it is necessary to investigate perceived fairness

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Also, in developing these types of systems, organizations may face tradeoffs between various justice characteristics (e.g., between satisfaction related to perceived consistency of a Web screening system versus disillusionment over an inability for applicants to "sell" themselves to a live person).

during the applicant screening stage. The purpose of this study is to assess the relative weight placed upon various "rules" or characteristics of justice (e.g., Gilliland, 1993; Leventhal, 1980) by individuals when assessing the fairness of a Web-based screening system, and to examine individual difference variables that might influence these weights.

Organizational justice researchers have primarily focused on three forms of justice—distributive (fairness of decision outcomes), procedural (fairness of the processes leading to outcomes), and interactional (interpersonal treatment received during the enactment of procedures; for a review, see Colquitt & Greenberg, 2003). We focus on procedural justice rather than distributive and interactional justice and use the term *fairness perceptions* to denote overall perceptions of procedural justice. Our focus on procedural justice is consistent with the agent-system model, which proposes that procedural justice concerns are more salient when formal organizational systems (such as an applicant screening system) are evaluated (for a thorough description of this model, see Bies & Moag, 1986). In contrast, distributive and interactional justice tend to be linked to the salience of specific agents *within* a system, and job applicants typically do not interact with specific agents until after initial screening has occurred.

Procedural Justice Characteristics and the Role of Trust in Technology

Procedural Justice

Scholars have proposed several taxonomies of procedural justice rules over the years. Leventhal's (1980) taxonomy proposed that a procedure is fair to the extent that it is correctable, consistent in application, based on accurate information and ethical standards, represents the interests of all involved, and employs safeguards against bias. He also identified the selection of the decision-making agent as a procedural component of any allocation system. Gilliland (1993) extended Leventhal's (1980) taxonomy, using an organizational justice perspective more applicable to selection contexts in particular. We adopt Gilliland's (1993) framework and consider four of his ten proce-

dural justice rules that apply most specifically to an applicant screening context—opportunity to perform (operationalized as the ability to provide additional unstructured information about oneself), reconsideration opportunity (operationalized as the ability to appeal a screening decision), consistency, and feedback timeliness. Gilliland's (1993) rules of two-way communication, honesty, and interpersonal effectiveness are less relevant to this study, because no substantive contact between applicant and organizational representative occurs during the screening process as we have defined it. Similarly, his selection information rule (i.e., explanations given after a distribution) is not applicable because of our focus on procedural rather than distributive or interactional justice. Finally, rules of job relatedness and propriety of questions are also not applicable to this study, because we are interested in the perceived fairness of the overall screening process, and not the fairness of specific questions that applicants might be asked as part of that process. In addition to our focus on these four characteristics, work by Gefen, Karahanna, and Straub (2003) on trust in technology and Leventhal (1980) and Thibaut and Walker (1975) on the importance of decision-making agents suggests a focus on human versus automated screening as a fifth characteristic.

Several studies have examined the importance of procedural characteristics, but these characteristics are often studied in isolation instead of simultaneously (e.g., Ployhart & Ryan, 1998). Ryan and Ployhart (2000) note, "whereas correlational studies have addressed the importance of justice characteristics, few studies have systematically manipulated these characteristics" (p. 596). Gilliland (1993) and Leventhal (1980) suggest that the importance of procedural justice characteristics to applicants may vary when making holistic evaluations of the fairness of a screening system. Also, in developing these types of systems, organizations may face tradeoffs between various justice characteristics (e.g., between satisfaction related to perceived consistency of a Web screening system versus disillusionment over an inability for applicants to "sell" themselves to a live person). Such tradeoffs have received little

research attention but are critical considerations for Web-based screening system developers. Indeed, if this study finds a hierarchy of importance among justice characteristics, developers will be better informed when faced with such tradeoffs, and organizational justice theory will be advanced.

In addition to the need to examine the potential tradeoffs in importance among various procedural justice rules, Gilliland (1993) suggests that researchers should begin to examine variables that might influence the amount of relative weight placed on procedural rules. Ryan and Ployhart (2000) similarly note the need for experimental selection fairness research that isolates moderating variables. Researchers have proposed certain individual difference variables that likely affect one's sensitivity to justice, or the degree to which justice is salient to an individual (e.g., Colquitt & Greenberg, 2003; Gilliland, 1993; Sweeney & McFarlin, 1997). In this study, we specifically examine gender, conscientiousness, and prior job application experience as potential moderators of the importance placed on procedural rules.

Trust in Technology

Concurrent with the increased interest in applicant perceptions of selection system fairness is an increase in the development and use of technology designed to enhance the efficiency of human resource management practices. In general, use of the World Wide Web in the staffing process is increasing. For example, Dineen, Ash, and Noe (2002) conducted the first known study that examined how Web technology might be leveraged to provide customized information to job seekers regarding likely fit with organizations. In addition, 12% of large U.S. companies were using Web-based screening systems as of 2001 (Cappelli, 2001). Web-based screening is a potentially valuable way for organizations to efficiently sort through a large influx of applications (Leonard, 2000). However, a lack of consideration of screening system fairness may reduce the motivation of job seekers to pursue an employment relationship with an organization, and may even expose an organization to legal action or other negative out-

comes (Cropanzano & Wright, 2003; Gilliland, 1993; Tan & Thoen, 2002).

Research examining trust in technology and trust in virtual agents is applicable to the current investigation. Studies have focused on individuals' trust in and use of e-commerce (Gefen et al., 2003; Tan & Thoen, 2002) or in their choice of automation or human control (Muir, 1994). This work generally suggests that trust and perceived fairness emanate from individuals' familiarity or comfort with the medium (Wiechmann & Ryan, 2003), perceptions of systems reliability (Hertzum, Andersen, Andersen, & Hansen, 2002; Muir, 1994), and the control mechanisms put in place to guard against system deficiencies or operator self-interest (Gefen et al., 2003; Tan & Thoen, 2002). For example, Tan and Thoen developed a model of trust in electronic commerce that suggests that individuals will feel comfortable engaging in a transaction if trust in the other party and trust in control mechanisms exceed one's trust threshold, where lower trust thresholds are associated with a history of satisfactory and reliable transactions. Gefen et al.'s (2003) model is similar, showing that calculative-based trust (i.e., a belief that a vendor has nothing to gain by acting dishonestly), structural assurances in the form of control mechanisms (e.g., legal remedies or appeals), and vendor familiarity are associated with trust. Others have suggested that control mechanisms might take the form of social pressures to conform to one's prescribed role (Jones, 2002). For example, a recruiter is expected to act honestly in screening applications because it is part of his/her socially prescribed role. Negative consequences may occur if he/she fails to meet these role expectations.

A common theme in this research is the requirement that individuals need knowledge and understanding of control mechanisms for these mechanisms to have an effect on trust (Jones, 2002). Tan and Thoen (2002) state, ". . . you can reach a higher level of trust than when you cannot evaluate the effectiveness yourself because you don't understand the control mechanism" (p. 237). Hertzum et al. (2002) note that the primary threat to the trustworthiness of an information source is to

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be unknown to the user, and that the absence of trust can, in some instances, turn to distrust. These theorists also suggest that trust is engendered by “communality,” or the extent to which others in a community are relying on a particular system to operate fairly.

Certain characteristics of Web-based screening systems are relevant to the above discussion and help to differentiate between automated screening systems and more traditional systems. First, although electronic job boards and company Web sites are being used by many organizations, these systems are relatively new, and job seekers are unfamiliar with how they are used to screen applicants (Hertzum et al., 2002; Timberlake, 2001). Thus, communality tends not to exist, and there is generally not an established pattern of reliability. Of course, it can be argued that job seekers do not actually view or meet decision-makers when they submit applications to be screened by humans. Thus, it could be argued that job seekers do not have a good idea of how these systems work, regardless of whether they are human or automated. Second, in terms of control mechanisms, automated systems are not pressured by socially prescribed norms (Jones, 2002). Thus, individuals may be less likely to perceive that effective control mechanisms exist when experiencing automated systems.

Because trust and justice perceptions have consistently been linked in the psychological literature (e.g., Brockner, 2002; Cohen-Charash & Spector, 2001), our preceding discussion of trust in technology and trust in virtual agents can be linked to our focus on the perceived justice of Web-based screening systems. We turn now to the development of hypotheses reflecting the integration of the procedural justice and trust-in-technology literatures described above. This is followed by a description of an empirical examination conducted to test these hypotheses.

Effects of Procedural Justice Characteristics

Provision of additional information. Applicants prefer selection procedures that allow them the opportunity to demonstrate their abilities and experiences (Arvey & Sackett, 1993; Bowen, Gilliland, & Folger, 1999), and

considerable research supports the value of having a voice in decisions (e.g., Greenberg, 1986; Leventhal, 1980). The process control dimension of Thibaut and Walker’s (1975) procedural justice model suggests that individuals value having a voice in decision-making processes, because voice provides a sense of control over the allocation process and, thus, the outcome of a decision (i.e., screening decision). Because voice enhances applicants’ perceptions of control over a screening process, they likely perceive that they can “control their fate” to a greater extent when allowed to provide additional information about themselves.

Having the opportunity to provide additional information also can be linked to the instrumental model of procedural justice, which suggests that people value fair procedures because they believe that when fair procedures are used, they will benefit in the long run (Tyler, 1987). Finally, Leventhal’s (1980) accuracy rule suggests that it is necessary to base allocations on as much high-quality information as possible. By allowing job applicants to provide additional information about themselves, perceptions that maximum information is available for a screening decision are likely enhanced.

Hypothesis 1: The ability for applicants to provide additional personal information in an applicant screening system will be associated with greater fairness perceptions.

Consistency of the screening system. Consistency has also been linked to perceptions of fairness (e.g., Barrett-Howard & Tyler, 1986; Gilliland, 1993; Leventhal, 1980) and is important because it assures applicants that they will be treated equitably in comparison to referent others. This follows from equity theory (Adams, 1965), such that a screening system is fair when input (applicant qualifications) to output (screening decision) ratios are equal among all applicants. Whereas equity theory has mostly been linked to distributive justice, Colquitt and Greenberg (2003) and Grienberger, Rutte, and Van Knippenberg (1997) suggest that it also applies to procedural justice (e.g., procedures can be judged to be consistently applied across ref-

erents). In a Web-based context, research pertaining to trust in technology reviewed earlier suggests that reliability, or consistency, is a key component of initial trust building (e.g., Tan & Thoen, 2002). As a result, reliability or consistency is likely to be related to perceptions of fairness.

Hypothesis 2: Perceived consistency of an applicant screening system will be associated with greater fairness perceptions among applicants.

Ability to appeal a decision. Thibaut and Walker's (1975) concepts of process control, or voice, and decision control suggest the importance of having the ability to appeal a screening decision. In addition, Leventhal's (1980) correctability rule states that opportunities should exist to modify and reverse decisions made at various points in an allocation process. A considerable amount of research points to a modifiable outcome as another important precursor to overall fairness perceptions (Arvey & Sackett, 1993; Greenberg, 1986; Leventhal, 1980). However, few studies have addressed the effects of providing opportunities to appeal decisions during the selection process. For example, Murphy, Thornton, and Reynolds (1990) examined drug testing and found higher ratings of justifiability when drug test results were retested. Consistent with the instrumental model of procedural justice and models of trust in technology that suggest the value of control mechanisms in e-commerce transactions (Gefen et al., 2003), the ability to appeal a screening decision is important because it signals to a potential applicant that an equitable outcome will be achieved in the long run, regardless of potential short-term system deficiencies.

Hypothesis 3: Ability to appeal an applicant screening decision will be associated with greater fairness perceptions among applicants.

Timeliness of a screening decision. Applicants withdraw from selection processes because of delays in receiving an employment offer (e.g., Arvey, Gordon, Massengill, & Mussio,

1975; Bowen et al., 1999; Rynes, Bretz, & Gerhart, 1991). Timeliness is a rule of managerial fairness (Sheppard & Lewicki, 1987), and the information adequacy component of procedural justice (Cropanzano & Greenberg, 1997) suggests that perceptions of procedural fairness may partly be determined by decision timeliness. In an applicant screening context, job seekers must decide to either accept or forgo employment opportunities as they arise, and face opportunity costs between competing opportunities. This makes the receipt of timely information critical to job seekers, to a greater extent than in other contexts (such as performance appraisal), where information delays do not directly translate into forgoing competing opportunities. In an applicant screening context, job seekers are likely to view long delays as unfair because they interfere with or prevent the search for or acceptance of other employment opportunities.

Hypothesis 4: Timeliness of an applicant screening decision will be associated with greater fairness perceptions among applicants.

Decision-making agent. Potential applicants are likely to hold fairness perceptions of the decision agent used by an organization, whether it is an automated agent or an actual company representative. Thibaut and Walker's (1975) decision control dimension of procedural justice suggests that the nature of the decision agent is likely important to job seekers because of the control the agent has over valued outcomes. Increasingly, applicant screening is being accomplished automatically by organizations using Web-based screening tools (Cappelli, 2001). Although several authors have addressed issues of trust and fairness of technology, studies have not directly examined how screening agents are related to fairness perceptions. For example, Grienberger et al. (1997) reviewed research suggesting that fairness perceptions are more strongly linked to intentions of persons, and the trust-in-technology literature is beginning to identify antecedents of technology adoption (Gefen et al., 2003). This study specifically investigates whether knowledge of the type of

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decision agent used in processing applications impacts fairness perceptions. However, because of the novelty of our particular context and research question, we make no specific hypothesis about which agent will be seen as more fair, only that the issue will be important to job seekers.

Hypothesis 5a: The decision-making agent used to screen applications, whether human or automated, will be related to applicants' fairness perceptions.

Fortunately, the literature does provide sufficient evidence to support the role of agent familiarity and its effects on perceived fairness. Specifically, trust in technology and trust in virtual agents has consistently been predicted by familiarity, such that individuals who are more comfortable, familiar, and efficacious with regards to use of computerized or automated mediums are likely to see such mediums as fairer than those who are less familiar with these mediums (e.g., Reynolds & Lin, 2003; Wiechmann & Ryan, 2003).

Hypothesis 5b: Applicant comfort with the World Wide Web will be positively associated with fairness perceptions when applicants experience automated screening procedures.

Relative weights of procedural justice characteristics. The procedural justice characteristics described above are all thought to be important antecedents to the perceived fairness of an applicant screening system. However, there is likely a hierarchy among the characteristics, such that some are more or less important than others. Leventhal, Karuza, and Fry (1980) noted that the relative weight or importance of procedural rules in a given allocation situation is critical, and developed allocation preference theory to better describe this state of affairs. This theory suggests that individual and contextual influences determine individuals' procedural rule preferences and that these preferences likely differ in importance.

Although few studies have investigated how each of the justice characteristics is likely to be weighed, research suggests con-

sistency might be weighed most heavily by job applicants (e.g., Ployhart & Ryan, 1998). For example, Barrett-Howard and Tyler (1986) found that consistency across individuals was the most important criterion of a fair procedure in the context of a limited-resource allocation. Sheppard and Lewicki (1987) elicited critical incident data on fairness from managers and found that the largest percentage of incidents related to the consistency rule. Leventhal (1980), in introducing his procedural justice rules, notes that the consistency rule may be applied to any of the procedural components of an allocation process. For example, appeals or timely feedback may or may not be consistently offered. Individuals also likely value consistency because it affirms their outcome as genuine and not due to chance or unfair advantage. In Web-based systems, consistency may be most important, because the reliability of such systems is a critical anchor to future judgments of trust (Tan & Thoen, 2002).

Whereas consistency is thought to be the most heavily weighed characteristic because it subsumes all other characteristics, having a voice in the decision-making processes has been identified as a "principle" of organizational justice (Greenberg & Lind, 2000). Specifically, procedures are seen as more fair to the extent that individuals have the opportunity to express themselves and exert a degree of control over an outcome (Gilliland, 1993; Thibaut & Walker, 1975). Two of the characteristics examined in this study—ability to provide additional information about oneself and ability to appeal—follow this principle most closely and are thus likely to be weighed relatively heavily.

Hypothesis 6a: Potential applicants will assign different weights to procedural justice characteristics such that certain characteristics will be more important determinants than others of overall fairness perceptions.

Hypothesis 6b: Among the justice characteristics, consistency will be weighed most heavily by applicants, followed by ability to provide information and ability to appeal.

Moderators: Gender, Conscientiousness, and Prior Job Application Experience

Gender. Colquitt and Greenberg (2003) suggest that males and females differ in their sensitivity to issues of fairness, which is consistent with theory and research on the behavior of females in allocation situations. For example, females tend to define success and achievement more in terms of the process than the outcome (e.g., Sweeney & McFarlin, 1997; Veroff, 1977). Thus, procedural elements of an allocation situation are likely more salient and important to females than to males. Females also might be more sensitive to formal procedural characteristics because of past discrimination and lack of access to informal selection or advancement mechanisms (Sweeney & McFarlin, 1997). That is, males tend to believe that procedures will benefit them in the long run and, thus, are less sensitive to the fairness of those procedures. In contrast, females are likely more sensitive to procedural elements of allocation systems, because these procedural elements have typically disadvantaged them in the past.

Although Cohen-Charash and Spector (2001) found that females and males did not differ in terms of magnitude of fairness perceptions, the study did not address the issue of relative sensitivity to specific procedural characteristics, and the authors suggested moving beyond examining simple main effects of gender. Reynolds and Lin's (2003) findings, on the other hand, showed that females reacted more negatively toward online screening processes than males. Also, Sweeney and McFarlin (1997) found differential effects among males and females with regard to justice judgment sensitivity, with males being more sensitive to distributive justice issues and females being more sensitive to procedural justice issues.

Hypothesis 7: Gender will interact with the procedural justice characteristics in predicting overall fairness perceptions, with female applicants giving greater weight to the characteristics.

Conscientiousness. One of the Big Five personality characteristics (characteristics iden-

tified as providing a comprehensive description of human personality), conscientiousness is defined as having both self-discipline and achievement-striving components (Barrick & Mount, 1991). Colquitt and Greenberg (2003) called for additional justice research employing the Big Five and mentioned conscientiousness in particular as a probable indicator of justice sensitivity. In a Web-based applicant screening context, it is probable that an individual's level of conscientiousness will affect the degree to which specific characteristics of such a system are salient and, thus, affect justice sensitivity.

Kristof (1996) theorized that conscientious job seekers are more likely to thoroughly investigate potential employers, and it is likely that such an investigation will involve an assessment of the fairness of screening tools used by an organization. In particular, the self-discipline facet of conscientiousness might drive job seekers to be more careful and deliberate in making assessments of fairness. Also, the achievement-striving facet of conscientiousness might cause a job seeker to more carefully weigh characteristics of a screening system in assessing its fairness because the result of such a screening process reflects on their past achievements and current level of achievement in gaining employment.

Hypothesis 8: Conscientiousness will interact with the procedural justice characteristics in predicting overall fairness perceptions, with more conscientious applicants giving greater weight to the characteristics.

Prior experience with applying for jobs. An individual's level of experience with selection processes is likely to be predictive of the degree to which they are sensitive to issues of justice (Gilliland, 1993; Ryan & Ployhart, 2000). In particular, Gilliland's (1993) model proposes a moderating effect of prior experiences with various selection procedures on the rule-fairness relationship. He theorizes that experienced applicants develop scripts or schemata that guide information evaluation. Violations of these schemata are therefore likely to be more salient and carry more weight in evaluating overall system fairness.

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This suggests that applicants use past experiences with selection systems as a benchmark with which to gauge the relative fairness of currently encountered systems. Some empirical evidence supports this suggestion, finding relationships between previous experience with a procedure and subsequent perceptions regarding that procedure (e.g., Ryan, Greguras, & Ployhart, 1996). The trust-in-technology literature similarly suggests that experience with systems tends to enhance trust in those systems, assuming that those experiences are positive (Gefen et al., 2003). Kray and Lind (2002) showed that one's own experiences with issues of injustice as well as the experiences of coworkers and supervisors affected one's subsequent justice judgments. In the present study, we operationalize prior experience with selection systems in terms of job application experience, which is particularly relevant because it refers to experience with the initial stage of the selection process.

Hypothesis 9: Level of prior job application experience will interact with the procedural justice characteristics in predicting overall fairness perceptions, with applicants with greater prior job application experience giving greater weight to the characteristics.

Method

Design and Participants

We used a policy-capturing design to investigate our hypotheses. Policy-capturing methodology has been used in numerous research domains including performance appraisal (Rotundo & Sackett, 2002), job choice (Judge & Bretz, 1992), and compensation decision making (Zhou & Martocchio, 2001). The methodology allows for an indirect assessment of the information-processing strategies of participants and is thought to enable a level of experimental control that allows for causal inferences about the effects of hypothesized factors on dependent variables (Cable & Judge, 1994). Greater experimental control in the present study answers calls made by organizational justice (Van den Bos, 2001) and selection-fairness researchers who

advocate use of a controlled context to investigate the weighing of justice rules (e.g., Ryan & Ployhart, 2000; Smither, Reilly, Millsap, Pearlman, & Stoffey, 1993).

Specifically, study participants read and responded to scenarios that manipulated levels of five within-subjects factors. These factors and their respective levels, as well as a sample scenario, can be found in Table I. Completely crossing the factors yielded 32 scenarios that allowed for a direct assessment of the relative weight placed on the five variables by participants. Between-subjects analyses also allowed for a pooled assessment of moderator variable effects.

Two separate surveys were distributed to 94 students in an upper-level undergraduate business course at a large Midwestern university eight weeks apart. The first survey was a preclass survey administered to students interested in various extra-credit opportunities during the term, and included measures of demographics, conscientiousness, and comfort with the World Wide Web. The second survey contained the policy-capturing part of the study and a measure of prior job application experience, and was matched to the first survey using identifier numbers.

Seventy-six sets of usable surveys were completed on participants' own time, an 81% response rate. Respondent's ages ranged from 20 to 44, with a mean age of 23.8. Fifty-five percent of participants were male. Ethnicities were as follows: 71% Caucasian, 18% Asian, 8% African-American, 3% other. Upper-level undergraduate students represent a valid participant pool for examining issues of screening system fairness, because many of them are likely to seek employment in the near future, making their assessments particularly important to organizations.

In keeping with recommendations of researchers to contextualize the study of procedural justice perceptions (e.g., Ryan & Ployhart, 2000), we placed our study in a Web-based screening context for two reasons. First, Web-based screening systems are becoming more prevalent yet have received little research attention. Also, a Web-based context facilitated a more realistic presentation of the decision agent characteristic (i.e., human or automated). Thus, the cover sheet of the sur-

TABLE I Manipulated Factors and Example Scenario*Manipulated factors*

1. Decision-making agent (human or automated)
 - An automated screening system reviews all of the applications submitted online.
 - An actual company representative reviews all of the applications submitted online.
2. Ability to provide additional information about oneself (yes or no)
 - There is a standard form that requires you to provide certain information about yourself; however, you can also add additional information about yourself if you choose.
 - There is a standard form that requires you to provide information about yourself; you cannot add additional information beyond what is asked.
3. Consistency (highly consistent or some inconsistencies reported)
 - This screening system uses consistent criteria across all candidates, as far as you know.
 - There have been some inconsistencies reported with regards to the criteria used to choose applicants.
4. Ability to appeal a decision (yes or no)
 - If you aren't initially chosen, there is an opportunity to provide follow-up information about yourself online.
 - If you aren't initially chosen, there is no opportunity to provide follow-up information about yourself online.
5. Timeliness of feedback (quick response or long time lag until a decision is rendered)
 - You'll get quick feedback as to whether or not you were chosen.
 - It will take awhile to get feedback as to whether or not you were chosen.

Example scenario

An actual company representative reviews all of the applications submitted online [decision agent]. There is a standard form that requires you to provide certain information about yourself; you cannot add additional information beyond what is asked [ability to add information]. This screening system uses consistent criteria across all candidates, as far as you know [consistency]. If you aren't initially chosen, there is an opportunity to provide follow-up information about yourself online [ability to appeal]. You'll get quick feedback as to whether or not you were chosen [timeliness of feedback].

vey containing the scenarios presented general information about the growing use of Web-based screening systems and their use in processing applications. Participants were asked to read each scenario "as if you were considering applying for a job through the Internet."

To establish the reliability of the survey and prevent order effects, we randomized the order of scenario presentation for each participant. Also, as a check to ensure that the order of cue presentation *within* each scenario did not influence results, we presented the timeliness variable as the last (fifth) variable on half of the surveys and first variable on the other half. Independent samples *t*-tests showed that the mean timeliness beta coefficient was similar when timeliness was presented either first or last ($t = .117, n.s.$). Also, mean R^2 values

did not differ between the two versions of the survey ($t = .483, n.s.$). To further ensure response reliability, we replicated four scenarios at the end of each survey and assessed the internal consistency of each participant in their responses to these scenarios (Karren & Baringer, 2000; Rotundo & Sackett, 2002). Indices ranged from .75 to .83, indicating sufficient internal consistency reliability.

Measures

Fairness perceptions. This two-item measure was adapted from a procedural justice scale previously used in research examining performance evaluation system fairness (e.g., Masterson, Lewis, Goldman, & Taylor, 2000). An example item is "The screening

TABLE II Means, Standard Deviations, and Correlations among Study Variables ^{a,b}

Variable	M	SD	1	2	3	4	5
1. Fairness perceptions	3.02	1.04					
2. Gender ^c	c	c	-.05*				
3. Conscientiousness	6.95	0.84	-.01	.21			
4. Prior job application experience	9.16	9.74	.03	.05	.00		
5. Comfort with the World Wide Web	4.24	0.88	.09**	-.15	-.04	.14	
6. Decision agent ^c	c	c	.12**	.00	.00	.00	.00
7. Additional information ^c	c	c	.27**	.00	.00	.00	.00
8. Consistency ^c	c	c	.45**	.00	.00	.00	.00
9. Ability to appeal ^c	c	c	.17**	.00	.00	.00	.00
10. Timeliness ^c	c	c	.10**	.00	.00	.00	.00

^a N = 2,432. N = 76 for means, standard deviations, and correlations among individual difference variables.

^b Because the study utilized a completely crossed design to assess the effects of system characteristics on fairness perceptions, correlations among system characteristics are zero by definition and, therefore, are not shown.

^c Effects coded variables. For effects coded variables, the following represent conditions coded as 1: Decision agent (processed by human); Ability to provide additional information (yes); Consistency (high); Ability to appeal (yes); Timeliness (quick response); Gender (female).

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

system used by this company is a fair one" (1 = *Strongly disagree*, 5 = *Strongly agree*). Coefficient alpha was .92.

Conscientiousness. Conscientiousness was measured on the presurvey using Goldberg's (1992) Big Five personality markers. The conscientiousness part of the scale consists of 20 adjectives, and participants were asked to "rate how accurately the trait describes you" on a scale ranging from 1 = *Extremely inaccurate* to 9 = *Extremely accurate*. Coefficient alpha was .87. The scale has shown convergent validity with the NEO Five Factor Model (Costa & McRae, 1992).

Prior job application experience. We measured this on the policy-capturing survey by asking, "In the past five years, how many jobs in total would you say you've applied for?"

Comfort with the World Wide Web. This was assessed on the presurvey using a two-item scale developed and used in prior Web-based staffing research (Dineen et al., 2002). An example item is "How comfortable would you say you are with using Web-based applications?" (1 = *Extremely uncomfortable*, 5 = *Extremely comfortable*). Coefficient alpha was .93.

Results

The means, standard deviations, and correlations among study variables are presented in Table II. To test for the possibility of participant fatigue in responding to the scenarios, we used a technique described by Judge and Bretz (1992) that involved comparing the average variance explained in the first half and last half of each respondent's survey. Had fatigue been influential, we would have expected decreased explained variance as respondents became tired and started using response sets (i.e., started responding in the same way to each scenario or using patterned responses despite random differences in scenarios). However, results indicated only a .0004 difference in the average R^2 value between the first and second half responses ($t = 0.23$, *n.s.*).

Pooled Sample Analyses

Multiple regression analysis was used to assess the relative effect of the manipulated variables on fairness perceptions for the sample as a whole. Because each participant made 32 assessments, the resulting study N was 2,432 (76 participants \times 32 scenarios).

Individual difference variables were replicated and appended to each of the 32 responses made by each participant. That is, each time a participant made an assessment, he or she brought a certain individual difference to bear on the assessment (e.g., for every response, a certain level of conscientiousness was present). This approach has been shown to be valid in prior policy-capturing research, since each assessment made by a participant is considered independent (Judge & Bretz, 1992). To create interaction terms for our interaction analyses, we multiplied each moderating variable by the five effects coded procedural justice rule variables.

Because these analyses were pooled across participants but contained multiple responses by each participant, autocorrelation, or a positive correlation between error terms, may be present (Hanushek & Jackson, 1977). The Durbin-Watson statistic provides a measure of autocorrelation, with an expected value of 2.0 when no autocorrelation is present. In the present analysis, the statistic was 1.51, indicating a level of autocorrelation that could cause traditional OLS regression analysis to produce biased statistical tests of regression coefficients (Judge & Bretz, 1992). We followed a procedure used in past research to neutralize problems introduced by autocorrelation that involves entering a dummy variable for each participant in the first step of an OLS regression equation (e.g., Rotundo & Sackett, 2002; Rynes, Weber, & Milkovich, 1989). This controls for each participant's idiosyncratic contribution to the overall regression and, thus, should produce accurate statistical tests of coefficients. In using this procedure, it is important to note that any effects of individual difference variables such as age or ethnicity that normally would be used as control variables were controlled by default.

As shown in Table III, hypotheses 1–4 were supported, as all four justice rules were associated with fairness perceptions in hypothesized directions. Across all analyses, betas ranged from .094 (timeliness) to .452 (consistency). Hypothesis 5a was also supported. Participants placed significant weight on the nature of the decision agent. The direction of the effect shows that human deci-

sion agents were viewed as fairer than automated decision agents. To further illustrate the nature of this particular result, we determined, based on means across participants for the 32 scenarios, which scenario was rated as the fairest among those including an automated decision agent and which was rated as fairest among those using a human decision agent. The mean fairness perceptions in these two scenarios differed significantly, $t(150) = 2.29$, $p < .05$, with the fairest scenario that included a human decision agent receiving a higher fairness rating ($M = 4.30$) than the fairest scenario that included an automated system ($M = 3.99$). Hypothesis 5b was also supported, as the correlation between comfort with the World Wide Web and fairness perceptions was .11 ($p < .01$) among automated screening scenarios.

Hypothesis 6 proposed that a hierarchy of relative importance would exist among the five independent variables in predicting fairness perceptions, with consistency weighted most heavily, followed by ability to provide additional information and ability to appeal. This hypothesis was partially supported. Figure 1 illustrates the hierarchy of importance among justice characteristics. Results of repeated measures analysis of the within-subjects regression equation coefficients using planned comparisons shows that most mean differences were significant. More specifically, the five independent variables were weighed in the following order of importance across participants: consistency, ability to provide additional information, followed by ties between (a) ability to appeal and decision-making agent, and (b) decision-making agent and timeliness. Ability to appeal and timeliness significantly differed in weight.

Interaction Analyses

Hypotheses 7–9 examined the effects of three individual difference variables as moderators of the relationship between the five procedural justice variables and fairness perceptions. Results are presented in Table III. First, hypothesis 7 was supported for four of the five justice characteristics in predicting fairness perceptions ($\Delta R^2 = .01$, $p < .01$). Table III shows that females placed greater

The direction of the effect shows that human decision agents were viewed as fairer than automated decision agents.

TABLE III Results of Pooled Regression Analyses with Factors Influencing Fairness Perceptions^a*Independent Variables*

Step 1: Participant dummy variables:

ΔR^2	.19**	.19**	.19**
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Step 2: Main effects:^{b,c}

	β	SE	β	SE	β	SE
Decision agent	.118**	.015	.116**	.015	.124**	.016
Additional info	.273**	.015	.274**	.015	.283**	.016
Consistency	.446**	.015	.452**	.015	.440**	.016
Ability to appeal	.165**	.015	.165**	.015	.172**	.016
Timeliness	.096**	.015	.094**	.015	.102**	.016
ΔR^2	.32**		.33**		.33**	

Step 3: Interaction terms:

<i>Gender x</i>	β	SE	<i>Conscientiousness x</i>	β	SE	<i>Applications x</i>	β	SE
Agent	.033*	.015	Agent	.394**	.018	Agent	.043	.003
Additional info	.086**	.015	Additional info	.401**	.018	Additional info	.081**	.003
Consistency	.029*	.015	Consistency	.549**	.018	Consistency	.041	.003
Appeal	.044**	.015	Appeal	.329**	.018	Appeal	.061*	.003
Timeliness	.007	.015	Timeliness	-.083	.018	Timeliness	-.022	.003
ΔR^2	.01**			.01**			.01**	

Total model R^2	.52**	.53**	.52**
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^a $N = 2,432$ for gender interaction model, 2,400 for conscientiousness interaction model, and 2,272 for application experience interaction model.

^b Individual difference variables would normally be entered as main effects prior to being included in the interaction analyses. However, similar to the approach used by Tomlinson, Dineen, and Lewicki (2004), their main effects are accounted for in Step 1, which controls for the idiosyncratic effects of each participant using the Rynes et al. (1989) approach.

^c For effects coded variables, the following represent conditions coded as 1: Decision agent (processed by human); Ability to provide additional info (yes); Consistency (high); Ability to appeal (yes); Timeliness (quick response); Gender (female).

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

weight on the use of a human decision agent, ability to provide additional information, consistency, and ability to appeal in assessing fairness perceptions (i.e., the positive relationships between these variables and fairness perceptions were stronger for females). Hypothesis 8 also received support. As shown in Table III, the block of interaction terms containing conscientiousness was significant ($\Delta R^2 = .01$, $p < .01$). Similar to females, conscientious individuals weighed a human decision agent, ability to provide additional information, consistency, and ability to appeal more heavily in assessing fairness perceptions.

Hypothesis 9, which suggested that prior job application experience would moderate the relationship between the justice characteristics and the outcome variables, received partial support. Prior to testing this hypothesis, we discovered three outliers in terms of job applications, using Tukey's (1977) Box Plot (available in SPSS 11.0). Results were nonsignificant using the full dataset but reached conventional levels of significance upon removing these outlying cases.

We report the significant findings in Table III but advise caution in their interpretation, given that they rely on removing the cases described (Cohen, Cohen, West, & Aiken,

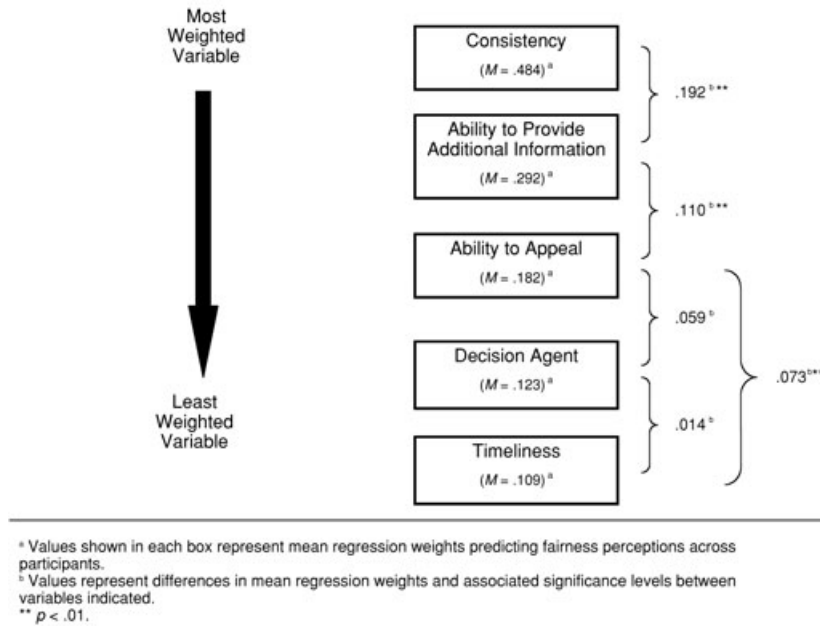


Figure 1. Hierarchy of importance among justice characteristics.

2003). Specifically, because the outliers in question were on the high end of the distribution, generalizability of results is limited to individuals with relatively less application experience. In the distribution with the outliers removed, those with greater job application experience weighed ability to provide additional information and ability to appeal more heavily in assessing fairness perceptions than those with less job application experience.

Discussion

This study provides an application of organizational justice theory to the critical human resource management issue of Web-based job applicant screening. In doing so, it contributes to the selection, justice, and information systems literatures and answers calls to (a) apply justice theories to real organizational problems (Greenberg & Lind, 2000) and (b) use more controlled contexts to investigate relative tradeoffs among justice characteristics (Ryan & Ployhart, 2000).

Consistent with predictions of organizational justice theory and the growing trust-in-technology literature, our results showed that the five procedural justice characteristics examined in this study were related to

the perceived fairness of a Web-based applicant screening system. Furthermore, a hierarchy of relative importance emerged, such that the consistency of the screening system exhibited the largest effect, followed by ability to provide additional information and ability to appeal. Moreover, post hoc analyses revealed a significant difference between the most fair and least fair scenario across all 32 scenarios, $t(150) = 15.22, p < .01, M(\text{most fair}) = 4.30, M(\text{least fair}) = 2.01$. This latter result suggests that there was considerable variability in participants' assessment of relative fairness across scenarios.

Participants viewed a human rather than automated decision agent as more procedurally fair. To our knowledge, this is the first study to establish such a link in an applicant screening context, although it is consistent with the general prevalence of and preference for face-to-face interviews among applicants (Steiner & Gilliland, 1996). The relational model of procedural justice helps explain this finding (Tyler & Lind, 1992). This model suggests that individuals value being treated fairly because such treatment signals inclusion or affirmation by members of a group. Perhaps applicants more readily associate feelings of inclusion or affirmation with fair-

...conscientious individuals tended to view Web-based screening systems as relatively fairer when the ability to provide additional information and appeal were available, a human decision agent was used, and consistency was in place.

ness exhibited by human screeners, whereas automated screening systems typically do not have the capability to communicate these types of signals. In addition, the trust-in-technology literature suggests that familiarity and control mechanisms are important technological considerations. As such, human screening may still be seen as fairer by job seekers because of the relative novelty of automated screening systems compared to traditional person-based methods, as well as social norms governing fair treatment of applicants by human screeners. We did find, however, that prior comfort with the Web enhanced fairness perceptions when applicants experienced an automated screening system.

This study further extends the justice literature by examining several individual difference variables that influence the weight people place on procedural justice characteristics. First, results of interaction analyses involving gender were consistent with our hypothesis and support Sweeney and McFarlin's (1997) findings. Specifically, compared to males, females indicated that screening systems that were consistent, offered the ability to provide additional information and to appeal decisions, and utilized a human decision agent were fairer. As Sweeney and McFarlin suggest, females may tend to be more sensitive to formal procedures and systems in obtaining various outcomes because of historical sex-role stereotyping or discrimination. Selection is an area especially prone to such problems (e.g., Heilman, Martell, & Simon, 1988), lending further plausibility to our findings.

Second, conscientious individuals tended to view Web-based screening systems as relatively fairer when the ability to provide additional information and appeal were available, a human decision agent was used, and consistency was in place. This is consistent with Kristof's (1996) suggestion that conscientious job seekers are more thorough in their job search and, thus, likely to judge the fairness of screening tools used by an organization more carefully. It might be the case that the self-discipline facet of conscientiousness causes job seekers to be more deliberate in making assessments of fairness, whereas the achievement-striving facet of conscientiousness causes a job seeker to more carefully

weigh characteristics of a screening system in assessing its fairness, since the result of such a screening process reflects on their past achievements and current level of achievement in gaining employment.

Third, researchers have suggested that prior experience with selection procedures might moderate the relationship between justice rules and fairness perceptions (e.g., Gilliland, 1993), and we found partial support for this suggestion. In general, those with more job application experience tended to weigh the ability to provide additional information and ability to appeal more heavily in assessing fairness perceptions. Perhaps an exposure to a variety of screening procedures makes these features more salient to experienced job seekers in assessing fairness (Gilliland, 1993; Wiechmann & Ryan, 2003).

Limitations

Our study results should be interpreted cautiously for several reasons. First, although we found several significant results in the interaction analyses, effect sizes were generally small. Thus the reader is cautioned against drawing firm conclusions based on these results alone; rather, future research should strive to replicate and extend the present results. Second, because the study used policy-capturing scenarios, the results have uncertain generalizability that will need to be further tested in actual screening situations. We chose to limit our context to Web-based screening and acknowledge that a scenario-based survey may not fully generalize to actual experiences with Web-based screening systems. We do, however, reiterate that selection fairness researchers have called for more controlled investigations to uncover the relative importance of various justice characteristics (e.g., Ryan & Ployhart, 2000). Further, policy-capturing methodology has recently been used in other settings to establish greater control of independent variables, allowing for direct comparisons of importance among variables (e.g., Rotundo & Sackett, 2002). In addition, researchers have found stronger relative effects of procedural justice in nonsimulated (versus simulated) settings (e.g., Tyler & Caine, 1981), which

suggests that our results might be conservative (Barrett-Howard & Tyler, 1986).

Third, we recognize that the variables manipulated in this study may not be the only ones considered by applicants in assessing screening system fairness. Despite our efforts to base the manipulated variables on selection-fairness research (Gilliland, 1993), scenario-based studies are prone to the “omitted variable problem” since they restrict the population of variables examined. Fourth, to isolate the unique effects of each procedural justice characteristic, we established orthogonality among them. However, the factors might not be orthogonal in reality. For example, consistency might be somewhat dependent on the decision agent (e.g., an automated system might be seen as more consistent). However, this is not necessarily the case if the screening system is programmed to search for different sets of qualifications at different times, or if similarly skilled applicants are judged differently by an automated system that happens to scan certain “keywords” on one of the applications. Further, if an automated system was thought by participants to be consistent, we likely would have found both an automated system and consistency to be positively related to fairness perceptions. That is, since consistency was thought by participants to be more fair, an automated decision agent also should have been perceived as more fair if the two variables were correlated, an effect that did not materialize.

Practical Implications and Future Research

Our results revealed that consistency and ability to provide additional information exhibited larger effects than other characteristics such as feedback timeliness. This suggests that if, in developing applicant screening systems, organizations face certain tradeoffs between justice characteristics, they should focus on issues such as consistency and ability to provide additional information at the expense of timeliness. Ability to appeal was only moderately important to job seekers, which may be a reassuring finding, because appeal mechanisms might be costly to implement early in a selection process. Results examining the effects of gender further suggest that organiza-

tions looking to attract a more gender-diverse workforce may want to ensure that their screening system incorporates the ability for applicants to provide additional information about themselves. Conscientiousness interactions revealed that individuals lower in conscientiousness did not differentiate as much between systems on the basis of certain procedural justice characteristics, whereas individuals high in conscientiousness did. Because conscientiousness has been consistently linked to job performance (Barrick & Mount, 1991), it would be advisable for organizations to pay increased attention to issues of procedural justice so as not to differentially lose more conscientious job applicants who perceive a system to be unfair. Our results involving prior job application experience, while not definitive and subject to caution as described earlier, might have implications for organizations vying to recruit more experienced personnel. Specifically, they suggest that experienced individuals tend to weigh justice characteristics more heavily when assessing Web-based screening system fairness.

Theory and research in trust in technology suggest that system reliability and salient control mechanisms are strong precursors to job seeker acceptance. Hertzum et al. (2002) and Bickmore and Cassell (2001) suggest that people look for cues that might assist them in forming opinions of virtual agents because of the uncertainty that currently exists in relating to them. Thus, Web-based screening developers might need to focus on making job seekers aware of these factors. Indeed, applicants’ trust in Web-based screening systems is probably best described as tentative at this point in time, because individuals have not yet had sufficient experience with these systems (Hertzum et al., 2002). The fact that human screeners were perceived as fairer than automated screeners suggests that developers might (a) focus on using human screeners, (b) work to make applicants more aware of how automated systems work, or (c) at least allow for the ability to contact a human being during automated application and screening processes, a suggestion reflected in Hertzum et al.’s work. Also, research of online virtual agents suggests that develop-

This suggests that if, in developing applicant-screening systems, organizations face certain tradeoffs between justice characteristics, they should focus on issues such as consistency and ability to provide additional information at the expense of timeliness.

ers of Web-based systems should allow for the provision of explanations for decisions to enhance trust in these systems (Shirley, 1999), and future work should more directly address this idea.

Future research of automated decision agents used in human resource management such as Web-based applicant screening should include perspectives from the marketing literature, which has begun to investigate customer reactions to self-service technologies (SSTs; e.g., Meuter, Ostrom, Roundtree, & Bitner, 2000). For example, it might be the case that an applicant's past experiences with SSTs as a consumer help shape his or her trust and perceptions of fairness of automated screening systems used in human resource management. Based on arguments proposed earlier, it will be interesting to track relative preferences for human versus automated systems over time, as it may be the case that these preferences merge to a greater degree as people become more familiar with automated systems. Of course, this will be

highly dependent on the extent to which these systems can demonstrate reliability.

Future research should pay more attention to how fairness perceptions during a Web-based screening experience relate to corporate reputation or word-of-mouth information passed among a network of job seekers. For example, whereas corporate reputation is receiving increased attention in the recruitment literature (e.g., Turban & Greening, 1996), corporate *selection system* reputation also should be investigated, and efforts have begun in this area (e.g., Sinar, Reynolds, & Paquet, 2003). Finally, future efforts should focus on examining the consequences of fairness perceptions. For example, it would be interesting to investigate any changes in applicant attraction, as well as influences on eventual job choice behavior, given screening system experiences.

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