

Applicant Reactions to Different Selection Technology: Face-to-Face, Interactive Voice Response, and Computer-Assisted Telephone Screening Interviews

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This research contributes to the understanding of reactions to different selection screening methods. A sample of students ($n = 153$) experienced one of three types of screening techniques, face-to-face interview screenings, telephone interview screenings, and interactive voice response (IVR) screenings, with identical content in a pre- to post-screening longitudinal study. We further examined the role of two important individual differences, cognitive ability and conscientiousness, in attitudes toward the screenings. IVR is a "non-interpersonal" screening method so it was not surprising that it was rated lower in terms of procedural justice factors such as interpersonal treatment, two-way communication, and openness but what is encouraging is that there were no differences between these labor intensive and costly technologies and IVR on the other procedural justice factors. Therefore, there does not appear to be any major negatives in terms of structural fairness among alternative screening devices implying that organizations can make choices between screening methods based on other factors such as recruitment strategy or cost.

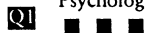
Introduction

A critical function of human resources is to attract and hire the best employees possible. Technologies such as telephone- and video-based interviews, Internet-based recruitment and assessment, and other information technologies that allow organizations to process large numbers of applications can help an organization have important savings in time and money (Anderson, 2003). In one illustration, Harris and Dewar (2000) showed that the use

of Internet sites could reduce the cost-per-hire from \$3,295 for traditional advertising formats to \$377 for online recruiting. What is unknown, however, is if the use of different selection technologies influences how applicants feel about organizations. We use an established procedural justice framework to study this.

In recent years, interest in examining the relationships among applicant reactions and other variables has grown. This includes the relationship between applicant reactions and organizational attractiveness (Ployhart & Ryan, 1998; Truxillo & Bauer, 1999), applicant test-taking motivation (Arvey, Strickland, Drauden, & Martin, 1990; Chan, Schmitt, DeShon, Clause, & Delbridge, 1997; Sanchez, Truxillo, & Bauer, 2000), and applicant behavioral

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intentions, such as recommending the organization to others (Macan, Avedon, Paese, & Smith, 1994). In addition, research has shown that feelings of justice violations may lead to negative feelings or actions such as lawsuits (Goldman, 2001; Seymour, 1988). Therefore, realizing the importance of applicant reactions helps organizations ensure that their selection procedures help garner the best employees while not inadvertently sending undesirable signals to all applicants, especially those who are not selected.

A major impetus for much of this work has been Gilliland's (1993) model of applicant reactions to selection which helped bring the focus of selection to the two-way nature of the interactions between applicants and hiring organizations. Gilliland's model outlines several situational and personal factors which are proposed to affect applicant reactions. To date, however, few studies have been published which examine the role of technology in selection as a specific situational factor. This is surprising given the dramatic rise in the use of technologies such as the Internet and computer-assisted interviewing in the past few years (Anderson, 2003).

In addition, few studies have examined individual differences from Gilliland's (1993) model of applicant reactions. This is equally surprising given the consistent calls in the literature to include individual differences in applicant reactions research (Ryan & Ployhart, 2000) and the consistent finding that personal factors such as cognitive ability (e.g., Hunter & Hunter, 1984; Ree, Earles, & Teachout, 1994) and personality (e.g., Barrick & Mount, 1991) are related to job performance. Here we focus on these two specific personal factors, cognitive ability and conscientiousness, in relation to fairness perceptions.

Therefore, the present study extends the research of applicant reactions to selection technology in three specific ways. First, we focus on the early stage of selection, the screening process. The screening stage is important because those who do not continue based on a negative experience during the screening process cannot be selected. Second, we compare three different test formats including computer-assisted telephone interviewing (TI), interactive-voice response (IVR) formats, and a traditional face-to-face (FTF) interview. To our knowledge, this is the first study to compare these specific formats. Third, we examine in our model two key individual differences, cognitive ability and conscientiousness, to understand whether or not the "best" applicants differ in their impressions of the three different selection formats.

Procedural Justice and Applicant Reactions

Cropanzano and Greenberg (1997) note that organizational justice was one of the most frequently studied topics in the 1990s. Most of the applicant reactions literature has drawn on research from the organizational justice litera-

ture (see Colquitt et al., 2001 for a broad review). Procedural justice refers to the perceived fairness of the methods used in making organizational decisions. Gilliland's (1993) model of applicant reactions delineates ten procedural justice rules which fall under three broader categories. His *explanation* category includes feedback, information known, and openness. The *formal* characteristics include chance to perform, consistency, job relatedness, and reconsideration opportunity. Finally, the *interpersonal treatment* category includes propriety of questions, treatment at the test site, and two-way communication. Bauer et al. (2001) developed a comprehensive measure of these procedural justice rules and found two higher-order factors (*social* and *structure fairness*) which are consistent with Greenberg and colleagues' (e.g., Greenberg, 1990) conceptualization of procedural justice. These two overarching factors consistently relate to important organizational outcomes (Bauer, Truxillo, & Paronto, 2003).

Situational Factors: The Role of Screening Format

We focused our study on the screening hurdle stage of selection. Employee selection often follows a two-part process similar to that described by Beach's (1993) image theory, which examines the decision process as two parts consisting of the screening and the choice stages. The screening stage is where individuals narrow down alternatives or reject them from the pool of possible options. The choice stage is a process of selecting the best choices from the remaining pool of acceptable options.

Similarly, organizations often screen individuals out of the selection process in an initial stage and then select the "best" applicants in subsequent stages. Therefore, screening stages often involve large numbers of applicants who, if they pass the initial screening, are moved forward to more costly and time-intensive selection procedures (Gatewood & Field, 2001). We focused on the early screening stage for three reasons. First, the initial screening of job applicants is a critical function. In fact, it has been noted that recruiting, selecting, and placing applicants were among the top three priorities of human resource professionals (Bureau of National Affairs, 2000; Straus, Miles, & Levesque, 2001) due to shortages of skilled workers, high turnover rates, and rapid business growth in the service sectors. Even in the face of a new era of downsizing, garnering the best employees and increasing workplace diversity are still key organizational goals. Second, organizations usually use initial job screening processes to determine who will be dropped from further consideration and who will advance to the next phase. Thus, these initial screenings define who remains in the applicant pool. Entry-level jobs are especially dependent upon the quality of initial screenings as the competition for hires is fierce at the lower end of the wage scale. Third, new selection technologies are being used intensively during the screening stage of selection,

making the examination of new technology an important area of research on applicant reactions.

There are a variety of different options for organizations needing to conduct initial screening of potential applicants. For example, it is estimated that 30% of Fortune 500 companies regularly conduct phone interviews (Straus et al., 2001). Similarly, Internet-based screening (IBS) interviews allow applicants to apply online at any time and companies to process thousands of individuals quickly and efficiently. While it is apparent that the Internet holds great promise for cost savings, it has some potentially major drawbacks. For example, older workers, women, and minorities are less likely to use the Internet than other groups which may create adverse impact concerns (Hogler, Henle, & Bemus, 1998; Sharf, 2000).

Telephone interviews (TI) using computer-assisted technology are a more convenient method than FTF for applicants but still requires staffing each interview with a trained interviewer. A cost-effective compromise between IBS and TI screenings is the use of Interactive Voice Response (IVR) technology, which utilizes a regular telephone by which applicants self-administer a screening (e.g., by pressing "1" for yes and "0" for no) (Tourangeau, Steiger, & Wilson, 2002). IVR is attractive for a variety of reasons. First, it is an easily accessible technology (for example 95% of households in the United States have phones; Bureau of the Census, 1990). Second, IVR allows applicants to initiate the interview at any time of any day. Third, IVR can help to avoid personal interview biases from entering into the selection process. Fourth, IVR can be a highly cost effective means of screening large numbers of applicants.

We have summarized some potential advantages and disadvantages of these three methods in Table 1. To date,

however, no one has researched the actual advantages and disadvantages of using IVR in terms of applicant reactions and important applicant and organizational outcomes such as intentions to accept a job offer. For example, if the best candidates are offended by the impersonal nature of IVR screening, this could have a serious impact on attracting the best candidates for the organization. Moreover, if the best candidates do not continue in the selection process, the utility of the overall selection system will be compromised (Murphy, 1986).

Because there is increased interpersonal interaction in the FTF and TI conditions, we expect applicants to perceive them as more fair in terms of certain procedural justice rules delineated by Gilliland (1993) than the impersonal IVR condition. For example, we predict that a FTF and TI screening would be seen more positively than IVR in terms of openness, treatment, two-way communication, and reconsideration opportunity, as IVR screening offers no opportunity for interpersonal interaction.

Hypothesis 1: IVR screening is predicted to be lower in terms of openness, treatment, two-way communication, and reconsideration opportunity than the FTF or TI screening after controlling for control variables.

However, we expect no differences in terms of the other six facets. For example, if the content of the questions themselves in no way differed between the three conditions because the questions asked were identical, we would not expect applicants to perceive differences in terms of Gilliland's (1993) dimensions of procedural justice including chance to perform, consistency, job-relatedness, or propriety of questions. Similarly, because feedback was given immediately following the screening in all three conditions, we would not expect differences in terms of

Table 1. Potential Advantages and Disadvantages of Three Commonly Used Screening Methods

Advantages	IVR	TI	FTF	Disadvantages	IVR	TI	FTF
Practical 24 hours per day (asynchronous)	✓			Can be expensive to set up	✓	✓	
Telephones are readily accessible	✓			More likely to "hang up"	✓		
Initiated by respondent	✓			No personal interaction	✓		
Inexpensive to utilize	✓			No ability to ask questions/clarify	✓		
Less potential for personal bias	✓	✓		Easier to 'fake' responses by self or other	✓		
Can process thousands of applicants quickly	✓			Labor intensive to 'staff' the interviews		✓	✓
Produces electronic database of all applicants	✓	✓		Must be able to 'catch' the applicant at home or arrange a time to call (synchronous)		✓	
Can continue to retry phone numbers until making contact		✓		Potential personal bias		✓	✓
Applicants are able to ask questions/clarify		✓	✓	Requires physical meeting place			✓
Less likely to 'hang up'		✓		Requires a specific time (synchronous)		✓	✓
Inexpensive to set up			✓	Number of interviews is limited to number of interviewers employed		✓	✓

feedback. Finally, information known should be similar across all conditions as all individuals were given the same amount of information about the screening.

Legal Intentions

Understanding factors that relate to the intentions of applicants to pursue legal actions is of great interest to organizations. Little research has been conducted, however, to indicate how selection methods might affect litigation intentions. For example, Lind (1997) describes a model that links procedural justice and legal intentions, and a few studies have examined actual legal behavior as an outcome of fairness perceptions (see Goldman, 2001; Lind, Greenberg, Scott, & Welchans, 2000). For example, Goldman (2001) surveyed unemployed individuals at unemployment offices and found that procedural and distributive justice were related to the self-reported behavior of actually filing a discrimination claim. However, the effects of selection technology on applicants' intentions to pursue legal actions have not been studied. Ideally, organizations would like to use the methods that are best able to decrease cost and increase timeliness while mitigating legal actions by applicants. Hogler, Henle, and Bemus (1998) note some ways organizations can avoid legal problems, but to date no study has actually assessed how applicants react to different screening methods in terms of legal intentions. Based on the lack of research in this area, we pose the following research question.

Research Question 1: Does applicant screening method (TI, FTF, IVR) affect ratings of intention to pursue legal action?

Perceptions of the Technological Sophistication of the Organization

In addition, technological advances have made it more commonplace for organizations to employ computer and telephone technologies during the selection process (Lievens, van Dam, & Anderson, 2002). Therefore, we examined whether using IVR would relate to applicants rating the hiring organization as more "cutting edge" in terms of technology than organizations that used more traditional phone or face-to-face interview techniques. Therefore, we included the following research question.

Research Question 2: Will companies using IVR screening be perceived as being more cutting edge in terms of HR methods than organizations using TI or FTF screenings?

Personal Factors: The Role of Individual Differences

Similarly, little research has examined the role of individual differences in forming reactions to selection. For example,

a recent review of the applicant reactions literature by Ryan and Ployhart (2000) called for more applicant reactions research on individual differences such as cognitive ability and personality. Cortina, Goldstein, Payne, Davison, and Gilliland (2000) note that cognitive ability and conscientiousness have consistently predicted job performance across a variety of jobs. Therefore, for this study we chose to focus on cognitive ability and conscientiousness as two key individual differences that might matter to hiring organizations interested in attracting the "best" applicants.

Cognitive Ability. Cognitive ability is related to the acquisition of job knowledge (e.g., Colquitt, LePine, & Noe, 2000; Ree, Carretta, & Teachout, 1995). Moreover, research suggests that cognitive ability is one of the most consistent predictors of job performance (Schmidt & Hunter, 1992). For example, Hunter and Hunter (1984) established a mean validity of .45 for cognitive ability's relationship with job performance. Furthermore, research shows that having a top candidate turn down a job offer can greatly decrease the utility of selection procedures (Murphy, 1986). Because applicants high on cognitive ability could be argued to be especially desirable, understanding the reactions of high cognitive ability applicants is particularly important to organizations. Therefore, it is key to understand how these individuals perceive screening technologies in order to enhance attraction and avoid alienation of those who are high on cognitive ability, as they are potentially the best applicants.

Research Question 3: Do those higher on cognitive ability differ in their fairness evaluations of the three different screening technologies when compared to those lower on cognitive ability?

Research Question 4: In terms of job pursuit intentions and organizational attractiveness, how do those higher on cognitive ability perceive companies that use IVR technology when compared to those lower on cognitive ability?

Conscientiousness. Conscientiousness is comprised of two related facets: achievement and dependability. Meta-analyses of the Five Factor Model of Personality have shown a consistent relationship between conscientiousness and job performance (e.g., Barrick & Mount, 1991; Tett, Jackson, & Rothstein, 1991). For example, Barrick and Mount (1991) found that conscientiousness is a predictor of successful performance across a wide range of jobs. People high on conscientiousness tend to be goal-directed, strong-willed, and determined. These individuals tend to be scrupulous and reliable (Costa & McCrae, 1992). Research has also shown a relationship between conscientiousness and goal commitment (Barrick, Mount, & Strauss, 1993). Because conscientious employees are often those most desirable to employers, another key aspect of our research

is to understand how conscientious employees view screening technologies and the companies that use them.

Research Question 5: Do those higher on conscientiousness differ in their fairness evaluations of the three different screening technologies when compared to those lower on conscientiousness?

Research Question 6: In terms of job pursuit intentions and organizational attractiveness, how do those higher on conscientiousness perceive companies that use IVR technology when compared to those lower on conscientiousness?

Method

Participants

Undergraduate students in psychology and business classes ($N = 317$) served as participants in the present study. Of these, 153 participants completed surveys at both time points, for a response rate of 48.3%. Based on the sample of participants with complete data, 69.3% were female. Whites made up 77.1% of the sample, 12.4% were Asian/Pacific Islander, 3.3% were Hispanic, 1.3% were African American, 1.3% were Native American and 3.9% classified themselves in some other way. The average age of the participants was 25.09 ($SD = 6.91$). In terms of employment and work experience, 64.1% of the sample was currently employed. The average number of hours worked by these participants was 22.47 ($SD = 9.59$). The number of months in full-time positions ranged from 0–300 ($M = 32.93$; $SD = 43.37$), while the number of months in part-time positions ranged from 0–144 ($M = 43.32$; $SD = 29.91$).

Procedure

Time 1. The first phase of data collection occurred in the participants' classrooms. Instructor permission was obtained before the data collection began. Participants were given a brief overview of the study before receiving their survey packets. They were also told at this time that if they completed both phases of the study, they would receive a \$5 calling card and would be eligible to win one of four, \$50 gift certificates. Next, they were instructed to place the last 4 digits of their student ID number on the front of the packet. They were then asked to read the cover letter/consent form, which provided them with additional information about the study. Any additional questions were addressed at this time.

The participants first completed a cognitive ability test. Upon completion, participants were asked to read over the description of the position for which they would be applying in the screening simulation. The scenario described an entry-level position in a company that was

designed to be moderately attractive to participants. After reading the scenario, participants were then asked to complete a measure of conscientiousness and a demographics questionnaire to assess potential control variables such as age, gender, and work experience. Participants also completed a contact card, which served the purpose of scheduling participants for screening as well as for sending reminders to participants about their scheduled screening.

Based on the color of the participant's contact card (the means for random assignment to the three conditions), the participant returned his or her survey packet and contact card to one of the researchers, who then either scheduled the participant to take the screening in person face-to-face (FTF) or via telephone interview (TI), or, in the case of the interactive voice response (IVR) condition, described below, instructed the participant to call the IVR number to take the screening. Participants were also instructed to go to the designated website to complete the final survey once they had completed the screening process.

Time 2. Participants completed the screening process based on their assigned condition. In the IVR condition, participants were given an instruction sheet to call the IVR number, take the automated screening, and, once they had finished the screening, to go to the website to take the final survey. In the TI condition, participants provided their best phone number on the contact card, and were asked for the time(s) and day(s) that would be best to have a researcher call them and administer the screening. These participants were given a reminder sheet stating their best times and phone number, and were asked to go to the website to take the final survey once they had gone through the screening. In the FTF condition, participants were scheduled to take a live interview screening at an office on campus. Once they completed the screening, the researcher took the participant to a computer and asked them to complete the final survey. The content of the screening for all three conditions was identical, that is, the three conditions varied only in the medium used to present the screening questions. The screening included ten short questions that tapped qualifications (e.g., Are you over 18 years of age or older? How many months of retail experience have you had before?).

Time 1 Measures

The Time 1 survey assessed potential key control variables. These consisted of demographic variables such as age, gender, race, and work history (e.g., hours worked per week, job tenure) as well as the two individual difference variables.

Cognitive Ability. The 50-item Wonderlic Personnel Test (WPT; Wonderlic Personnel Test, 1992) measure was used to assess cognitive ability. The items consist of math, verbal, and general problem solving, with

increasing difficulty. Participants had 12 minutes to answer as many questions as possible. Many studies have documented the reliability of the Wonderlic (e.g., Dodrill, 1983).

Conscientiousness. Conscientiousness (e.g., "I keep my belongings neat and clean." $\alpha = .84$) was assessed with a 12-item measure called the "NEO" based on the Five-Factor Model of personality (Costa & McCrae, 1992). Ratings of these items were made on a 5-point Likert scale (1 = strongly disagree; 5 = strongly agree).

Time 2 Measures

The measures discussed in this section were assessed through the web-based survey that participants took upon completion of their screening. Scales were factor analyzed and showed separate factors. All items in the scales loaded on their intended factors, with acceptable percent variance accounted for by the solution and high communalities for each item.

Selection procedural justice scale (SPJS). The SPJS (Bauer et al., 2001) was used to assess dimensions of process and outcome fairness, based on Gilliland's (1993) model. The SPJS contains 11 dimensions of fairness, which are subsumed by two higher-order factors: structure fairness and social fairness. The structure fairness subscale includes five justice rules: *job-relatedness-predictive* (e.g., "Passing this screening means a person can do this job well" $\alpha = .75$), *information known* about the test (e.g., "I understood in advance what the screening would be like" $\alpha = .86$), *chance to perform* (e.g., "I could really show my skills and abilities through this screening" $\alpha = .94$), *reconsideration opportunity* (e.g., "I was given ample opportunity to have the results of my screening rechecked, if necessary" $\alpha = .92$), and *feedback* (e.g., "I had a clear understanding of when I would get the results of my screening" $\alpha = .84$). Social fairness also consisted of five fairness justice rules: *consistency* (e.g., "I think this type of screening would be administered to all applicants in the same way" $\alpha = .89$), *openness* of the testing staff (e.g., "I was treated honestly and openly during the screening" $\alpha = .86$), *treatment* (e.g., "I was treated politely during the screening" $\alpha = .91$), *propriety of questions* (e.g., "The content of the screening did not appear to be prejudiced" $\alpha = .86$), and *two-way communication* (e.g., "There was enough communication during the screening" $\alpha = .89$). *Job-relatedness-content* (e.g., "It would be clear to anyone that this screening is related to this job" $\alpha = .85$) is the eleventh SPJS factor, not subsumed under the above-mentioned social and structure fairness higher-order factors. Each of these scales was assessed using 5-point Likert scales (1 = strongly disagree to 5 = strongly agree).

Outcomes. Four key organizational outcome measures were also assessed at Time 2, using 5-point Likert scales. Participants' *litigation intentions* were assessed using a five-item scale from Bauer et al. (2001; e.g., "An organization that screens applicants in this way would probably be sued by applicants" $\alpha = .86$). Participants' *perceptions of organizational technological sophistication* were assessed using a newly developed, three-item measure (e.g., "A company that screens applicants in this way is on the cutting edge" $\alpha = .91$). *Organizational attractiveness* was assessed with five items from Bauer et al. (2001; e.g., "This organization is one of the best places to work" $\alpha = .87$). Finally, *job acceptance intentions* were measured with a four-item scale adapted from Smither, Reilly, Millsap, Pearlman, and Stoffey (1993; e.g., "I would seriously consider this company as a possible employer" $\alpha = .86$).

Results

Descriptive statistics, intercorrelations, and alpha reliability estimates for all study variables are presented in Table 2. To determine whether there were demographic differences between the three screening groups that should be controlled for in the analyses, we ran a series of ANOVAs with screening condition as the independent variable, and potential demographic controls as the dependent variables such as age, gender, the time lag between the two phases of the study, race, screening pass rates, employment status, level of education attained, and GPA. Of these variables, age, $F(2, 150) = 3.76, p < .05, R^2 = .05$, and the number of days between completing both phases of the study, $F(2, 144) = 3.84, p < .05, R^2 = .05$, were significantly related to screening condition. Therefore, these variables were used as controls in subsequent analyses.

Although Hypothesis 1 only focused on four of the SPJS facets, we included all 11 facets in our analyses. To test Hypothesis 1, we ran a series of ANCOVAs with simple contrasts comparing IVR to each of the other screening conditions across the SPJS facets. Table 3 displays the estimated marginal means for each fairness facet by condition with two covariates (age and days between T1 and T2).

Hypothesis 1 was supported for all of the procedural justice facets where differences were expected based on screening condition. Specifically, after controlling for the variance in fairness accounted for by the control variables, significant differences based on screening condition were found for perceptions of reconsideration opportunity, $F(2, 138) = 17.38, p < .01, \text{partial } \eta^2 = .20$; openness, $F(2, 140) = 3.97, p < .05, \text{partial } \eta^2 = .05$; treatment, $F(2, 138) = 12.16, p < .01, \text{partial } \eta^2 = .15$; and two-way communication, $F(2, 140) = 9.30, p < .01, \text{partial } \eta^2 = .12$. As predicted, no differences were found based on screening condition for consistency, job-relatedness, information

Table 2. Means, Correlations, and Alpha Reliability Estimates for Study Variables

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1. Age	25.09	6.91	-																							
2. Gender	0.69	0.46	-.08	-																						
3. Days betw. TI/T2	3.20	4.74	-.07	.22**	-																					
4. Employment Status	0.64	0.48	-.15	.09	-.01	-																				
5. Actual Pass/Fail	0.67	0.47	.10	.17*	.06	.19*	-																			
6. IVR vs. FTF	0.34	0.48	-.12	-.03	.12	-.10	-.04	-																		
7. IVR vs. TI	0.31	0.47	-.10	.05	.11	.04	-.01	-.49**	-																	
8. Cognitive Ability	23.29	5.49	.10	-.13	.11	.15	-.08	-.09	.05	-																
9. Conscientiousness	4.10	0.50	.01	.08	.08	.13	.10	-.04	.03	-.05	(.84)															
10. Job rel.: predictive content	2.35	0.77	-.06	-.03	.04	-.06	.03	.15	-.10	-.06	-.01	(.75)														
11. Job rel.: known	2.54	0.89	.05	-.05	.02	.03	-.07	.17*	-.10	.02	-.05	.49**	(.85)													
12. Information	2.92	0.97	.02	.06	.01	.17*	.19*	.07	.08	.10	.03	.26**	.23**	(.86)												
13. Chance to perform	1.66	0.70	-.08	-.07	-.07	-.02	.14	.07	-.01	-.06	-.11	.58**	.43**	.30**	(.94)											
14. Reconsid. opportunity	2.19	0.85	-.06	-.02	-.05	-.08	.16	.44**	-.22**	-.16*	-.19*	.37**	.30**	.31**	.38**	(.92)										
15. Feedback timeliness	2.73	1.00	.00	-.03	.01	.04	-.02	.15	.01	.02	-.11	.23**	.17*	.27**	.15	.43**	(.84)									
16. Consistency of admin.	3.52	0.93	.01	.04	-.13	.21*	.25**	.12	-.05	.01	.01	.06	.12	.14	.13	.14	.25**	(.89)								
17. Openness	3.64	0.83	-.11	-.08	.09	-.02	.05	.23**	-.02	-.01	-.04	.34**	.22**	.20*	.15	.40**	.34**	.19*	(.86)							
18. Treatment at test site	3.86	0.71	-.04	-.08	.11	-.04	.07	.40**	-.07	.13	-.06	.28**	.28**	.24**	.15	.46**	.38**	.26**	.62**	(.91)						
19. Two-way communication	2.96	0.95	-.02	-.08	.08	-.02	.03	.33**	-.05	.12	-.03	.32**	.25**	.24**	.26**	.48**	.24**	.20*	.54**	.59**	(.89)					
20. Propriety of questions	3.66	0.90	.07	-.02	.05	.05	.11	.08	-.05	.10	.13	.30**	.35**	.41**	.22**	.24**	.15	.46**	.34**	.43**	.40**	(.86)				
21. Litigation intentions	2.46	0.73	-.07	.05	.01	.01	.08	-.19*	.05	-.18*	.03	-.10	-.10	-.09	-.09	-.14	-.10	-.31**	-.22**	-.35**	-.26**	-.32**	(.86)			
22. Cutting Edge	2.46	0.85	-.07	.06	.00	-.03	.16	.06	-.16	-.18*	-.04	.38**	.30**	.26**	.45**	.31**	.10	.06	.28**	.19*	.31**	.23**	-.10	(.91)		
23. Org. Attractiveness	3.08	0.65	-.03	.16	-.02	-.01	.20*	.17*	.01	-.09	.07	.31**	.27**	.29**	.30**	.37**	.18*	.28**	.37**	.27**	.29**	.32**	-.11	.42**	(.87)	
24. Job Accept. Intentions	3.61	0.79	-.06	.08	.03	.01	.31**	.06	.03	.00	.08	.24**	.16*	.11	.13	.20*	.23**	.22**	.40**	.23**	.25**	.27**	.00	.28**	.61**	(.86)

Notes: N = 135-153. Gender was coded 0 = male, 1 = female. Employment status was coded 0 = not employed, 1 = employed. Actual Pass/Fail was coded 0 = failed screening, 1 = passed screening. IVR vs. FTF was coded 0 = IVR, 1 = FTF. IVR vs. TI was coded 0 = IVR, 1 = TI. Values in parentheses are alpha reliabilities. *p < .05, **p < .01.

Table 3. Mean Differences on Fairness Facets by Condition Evaluated at Covariates Age and Days Between Time 1 and Time 2

Fairness Facet	Marginal Means Evaluated at Covariates				Partial η^2 for Condition
	IVR ($n = 53$)	FTF ($n = 52$)	TI ($n = 48$)	R^2	
1. Job-relatedness: predictive	2.32	2.53	2.23	.03	.03
2. Job-relatedness: content	2.41	2.77	2.41	.04	.04
3. Information known	2.73	3.05	3.05	.02	.02
4. Chance to perform	1.59	1.71	1.64	.02	.01
5. Reconsideration opportunity	1.88	2.72	1.91	.21**	.20**
6. Feedback	2.50	2.98	2.75	.04	.04
7. Consistency of administration	3.41	3.74	3.48	.04	.03
8. Openness	3.44	3.91	3.62	.07*	.05*
9. Interpersonal treatment	3.56	4.22	3.77	.16**	.15**
10. Two-way communication	2.60	3.40	2.89	.12**	.12**
11. Propriety of questions	3.62	3.81	3.60	.02	.01

Notes: $N = 153$. IVR = Interactive Voice Response, FTF = Face-to-Face Interview, and TI = Telephone Interviewing. ** $p < .01$.

known, propriety of questions, feedback, and chance to perform.

A priori comparisons using simple contrast were used to compare IVR screening to FTF and TI screening (adjusted means are presented in Table 2). Results indicate that perceptions of reconsideration opportunity were significantly lower for participants in the IVR condition compared to participants in the FTF condition $F(1, 138) = 26.55, p < .01$. There were no differences between the IVR and TI conditions $F(1, 138) = 0.22, ns$. Differences in perceptions of openness of the testing staff were found between IVR and FTF screening, such that perceptions of openness were greater for FTF screening, $F(1, 140) = 7.74, p < .01$. No differences were found between IVR and TI screening, $F(1, 140) = 1.11, ns$. Perceptions of treatment during the screening process were significantly more positive for FTF than IVR screening, $F(1, 138) = 23.12, p < .01$. No differences were found between IVR and TI conditions $F(1, 138) = 2.43, ns$. Finally, two-way communication perceptions were greater in FTF than IVR screening $F(1, 140) = 17.86, p < .01$. No differences were found between IVR and TI screening $F(1, 140) = 2.33, ns$.

Analysis of covariance was also used to examine the relationship between screening type and litigation intentions (Research Question 1). Participant age and time elapsed between completing both phases of the study were again entered as covariates. Because there was no hypothesis, post hoc tests with Bonferroni adjustment for multiple comparisons were used to make all possible comparisons between groups. A significant effect was obtained for screening condition $F(2, 141) = 4.09, p < .05, R^2 = .06$. Post hoc comparisons indicated that the adjusted mean

intention to litigate for FTF screening ($M = 2.24$) was significantly lower than the mean for IVR screening ($M = 2.64$), $F(1, 141) = 7.80, p < .03$. No other significant differences were found.

Company Image. Analysis of covariance was also used to examine Research Question 2, the effects of screening condition on participants' perceptions of the company's image. Participant age and number of days between completing both phases of the study were again entered as covariates. The overall equation was not significant, $R^2 = .04, F(4, 142) = 1.38, ns$, though the test for differences by screening condition was significant at the .10 level, $F(2, 142) = 2.54, p < .10$. Specifically, the a priori contrast indicated that company image perceptions were higher for IVR screening (adjusted $M = 2.62$) compared to TI screening (adjusted $M = 2.24$).

Effects of Cognitive Ability. Hierarchical multiple regression was used to test Research Questions 3 and 4. Screening condition, dummy coded with IVR as the comparison group and cognitive ability score were entered in Step 1. The interactions between screening condition and cognitive ability (multiplicative terms) were entered in Step 2 to predict perceptions of procedural justice (Research Question 3) in terms of social and structure fairness, the overarching procedural justice factors identified by Bauer et al. (2001). To reduce the effects of multicollinearity, the main effects variables were centered, and the interactions were created from these centered variables (see Aiken & West, 1991). These variables were used to predict participants' perceptions of social and structure fairness. Results are presented in Table 4.

Table 4. Hierarchical Regression with Screening Condition, Cognitive Ability, and Interactions of Screening Condition and Cognitive Ability for Structure and Social Fairness

Variable	Structure Fairness			Social Fairness		
	R^2	ΔR^2	β	R^2	ΔR^2	β
Step 1	.08*			.13**		
IVR vs. FTF			.30**			.39**
IVR vs. TI			.08			.09
CA			-.04			.16*
Step 2	.09*	.02		.16**	.03†	
IVR/FTF X CA			-.08			-.05
IVR/TI X CA			.06			-.19*

Notes: $N = 141-145$. Betas are reported for the final equation. Screening pass/fail is coded 0 = fail, 1 = pass. IVR vs. FTF is coded 0 = IVR, 1 = FTF. IVR vs. TI is coded 0 = IVR, 1 = TI. R^2 and ΔR^2 may not coincide due to rounding. † $p < .10$, * $p < .05$, ** $p < .01$.

The overall equation predicting structure fairness was significant, $R^2 = .09$, $F(5, 140) = 2.82$, $p < .05$. The addition of the interaction terms did not explain a significant amount of variance in structure fairness beyond the main effects, $\Delta R^2 = .02$, $F(2, 140) = 1.12$, *ns*. Based on the final equation, the only significant unique predictor of structure fairness was screening condition. Specifically, structure fairness perceptions were greater for participants who took FTF screening than for IVR screening ($\beta = .30$). The overall equation for social fairness was significant, $R^2 = .16$, $F(5, 139) = 5.36$, $p < .01$. The inclusion of the interaction terms in Step 2 resulted in a significant increase in R^2 at the .10 significance level, $\Delta R^2 = .03$, $F(2, 139) = 2.40$, $p < .10$. Based on the final equation, there was a main effect for screening condition. Specifically, social fairness was greater for FTF screening than for IVR screening ($\beta = .39$). There was also a main effect for cognitive ability, such that participants higher on cognitive ability had greater perceptions of social fairness ($\beta = .16$). However, these results are qualified by a significant interaction between g and the IVR/TI screening dummy variable ($\beta = -.19$). The nature of this interaction is depicted in Figure 1. Based on Figure 1, perceptions of social fairness for TI screening were lower than social fairness perceptions for IVR screening at lower levels of g . However, at higher levels of cognitive ability, social fairness perceptions decreased even further for TI screening, but increased slightly for IVR screening.

To test the relationship between cognitive ability and organizational attractiveness and job pursuit intentions (Research Question 4), a hierarchical regression equation was computed with the main effects of screening condition and g entered in Step 1 (controlling for screening pass/fail), followed by the interaction of g and screening condition in Step 2. The main effects and interactions were created as described above. The interactions of g and screening

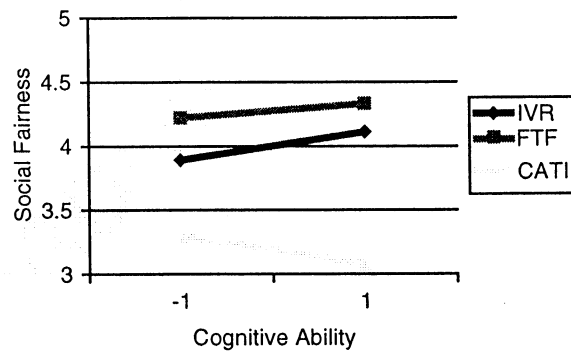


Figure 1. Interaction of cognitive ability and screening condition on social fairness

condition were entered in Step 2. Results are presented in Table 5.

Based on the final regression equation, a significant amount of variance in organizational attractiveness was predicted, $R^2 = .09$, $F(6, 146) = 2.39$, $p < .05$. The inclusion of the interaction of cognitive ability and condition in Step 2 failed to explain a significant amount of incremental variance in organizational attractiveness, $\Delta R^2 = .00$, $F(2, 146) = 0.30$, *ns*. Based on the final equation, organizational attractiveness was greater for participants in the FTF screening condition compared to the IVR screening condition ($\beta = .24$). In addition, passing the screening was associated with greater perceptions of organizational attractiveness ($\beta = .20$).

Analyses were performed in the same manner for job pursuit intentions. The final equation was significant, $R^2 = .10$, $F(6, 146) = 2.79$, $p < .05$. The inclusion of the interaction of GMA and screening condition did not significantly improve prediction of job pursuit intentions, $\Delta R^2 = .00$, $F(2, 146) = 0.32$, *ns*. Based on the final equation, the only significant predictor was screening

Table 5. Hierarchical Regression with Screening Pass/Fail, Screening Condition, Cognitive Ability, and Interaction of Cognitive Ability and Condition for Organizational Attractiveness and Job Acceptance Intentions

Variable	Organizational Attractiveness			Job Pursuit Intentions		
	R^2	ΔR^2	β	R^2	ΔR^2	β
Step 1	.09*			.10**		
Screening pass/fail			.20*			.31**
IVR vs. FTF			.24*			.12
IVR vs. TI			.13			.10
CA			-.06			.03
Step 2	.09*	.00		.10*	.00	
IVR/FTF X CA			.07			-.01
IVR/TI X CA			.04			-.02

Notes: $N = 133$ – 134 . Betas are reported for the final equation. Screening pass/fail is coded 0 = fail, 1 = pass. IVR vs. FTF is coded 0 = IVR, 1 = FTF. IVR vs. TI is coded 0 = IVR, 1 = TI.

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

pass/fail ($\beta = .31$). That is, those who passed the screening had the greatest intentions to pursue employment with the fictitious organization.

Effects of Conscientiousness. Analyses testing the relationship of conscientiousness and fairness (Research Question 5) and the relationship of conscientiousness and organizational outcomes (i.e., attractiveness and job pursuit intentions; Research Question 6) were conducted in the same manner as those for cognitive ability.

The overall regression equation predicting structure fairness was significant, $R^2 = .09$, $F(5, 137) = 2.74$, $p < .05$. Results are presented in Table 6. The addition of the interaction terms in Step 2 failed to produce a significant increase in explained variance in structure fairness, $\Delta R^2 = .01$, $F(2, 137) = 0.79$, *ns*. Based on the final equation, one predictor had a unique relationship with structure fairness. Specifically, participants in the FTF screening condition had greater structure fairness perceptions than participants who took IVR screening ($\beta = .36$). No relationship was found between conscientiousness and structure fairness.

Regarding the analysis for social fairness (see Table 6), the final regression equation was significant, $R^2 = .11$, $F(5, 138) = 3.57$, $p < .01$. However, the inclusion of the interaction terms in Step 2 did not result in a significant increase in variance explained, $\Delta R^2 = .01$, $F(2, 138) = 0.72$, *ns*. Based on the betas for the final equation, FTF screening was associated with greater perceptions of social fairness than was IVR screening ($\beta = .28$). Conscientiousness again showed no relationship to fairness perceptions.

In terms of the relationship of conscientiousness and key organizational outcomes (see Table 7), the overall equation for organizational attractiveness was significant, $R^2 = .09$,

$F(6, 146) = 2.43$, $p < .05$. The inclusion of the interaction of conscientiousness and screening condition failed to produce a significant increase in R^2 , $\Delta R^2 = .01$, $F(2, 146) = 0.55$, *ns*. Similar to the analysis including cognitive ability, the only significant predictors of attractiveness were being in the FTF screening condition compared to the IVR condition ($\beta = .24$), and passing the screening ($\beta = .20$). The regression equation predicting job pursuit intentions was also significant, $R^2 = .11$, $F(6, 146) = 2.99$, $p < .01$. The inclusion of the interaction of conscientiousness and screening condition did not significantly improve prediction of job pursuit intentions, $\Delta R^2 = .01$, $F(2, 146) = 0.38$, *ns*. Passing the screening was the only significant predictor of job pursuit intentions, with those who passed having higher intentions to pursue employment at the fictitious organization ($\beta = .30$).

Discussion

Traditionally organizations have used screening methods that are time and labor intensive such as face-to-face or telephone interview screenings. More recently IVR screenings have been introduced which increase efficiency and decrease labor costs because applicants self-administer the screening. This study is the first to compare applicant reactions to these three screening methodologies.

We found both positive and negative aspects of using IVR screening. On the positive side, no differences were found among the best applicants (those high on cognitive ability or conscientiousness) for each condition using organizational attractiveness and job pursuit intentions as outcomes. While we did find differences across methods for certain aspects of fairness such that IVR was lower than FTF screenings, no differences were found between TI and

Table 6. Hierarchical Regression with Screening Condition, Conscientiousness, and Interactions of Screening Condition and Conscientiousness for Structure and Social Fairness

Variable	Structure Fairness			Social Fairness		
	R^2	ΔR^2	β	R^2	ΔR^2	β
Step 1	.08**			.11**		
IVR vs. FTF			.36**			.28**
IVR vs. TI			.09			.07
Conscientiousness			.00			-.11
Step 2	.09*	.01		.11**	.01	
IVR/FTF X Conscientiousness			-.10			-.06
IVR/TI X Conscientiousness			-.02			-.12

Notes: $N = 143-144$. Betas are reported for the final equation. Screening pass/fail is coded 0 = fail, 1 = pass. IVR vs. FTF is coded 0 = IVR, 1 = FTF. IVR vs. TI is coded 0 = IVR, 1 = TI. R^2 and ΔR^2 may not coincide due to rounding. * $p < .05$, ** $p < .01$.

Table 7. Hierarchical Regression with Screening Pass/Fail, Screening Condition, Conscientiousness, and Interaction of Conscientiousness and Condition for Organizational Attractiveness and Job Acceptance Intentions

Variable	Organizational Attractiveness			Job Pursuit Intentions		
	R^2	ΔR^2	β	R^2	ΔR^2	β
Step 1	.08*			.11**		
Screening pass/fail			.20*			.30**
IVR vs. FTF			.24**			.12
IVR vs. TI			.13			.10
Conscientiousness			.04			.05
Step 2	.09*	.01		.11**	.00	
IVR/FTF X Conscientiousness			-.06			-.08
IVR/TI X Conscientiousness			.04			-.04

Notes: $N = 133-134$. Betas are reported for the final equation. Screening pass/fail is coded 0 = fail, 1 = pass. IVR vs. FTF is coded 0 = IVR, 1 = FTF. IVR vs. TI is coded 0 = IVR, 1 = TI. * $p < .05$, ** $p < .01$.

IVR screenings. This indicates that cost savings from implementing IVR screenings over TI are one way to cut costs while not creating fairness concerns.

Interestingly, we found that litigation intentions were lowest in the FTF condition as compared to the IVR condition. No differences were found among these and the TI condition. This is paradoxical as results of our a priori comparisons regarding fairness ratings in each condition indicated that no differences were found across conditions in which we felt were some key areas for legal concerns. Specifically, no differences were found for job-relatedness-predictive, job-relatedness-content, chance to perform, feedback, consistency of administration, and propriety of questions. In terms of company technology image, we

found some evidence that companies using IVR were seen as more advanced than those using TI screenings. All of these results are encouraging for those considering utilizing IVR as a potential screening method.

Our research questions explored how the best applicants, in terms of cognitive ability and conscientiousness, differed in terms of social and structure fairness as well as organizational attractiveness and job pursuit intentions. We found no differences in terms of the applicants for structure fairness but we did find that individuals who were higher in cognitive ability were more likely to see IVR as socially fair than those low in cognitive ability. Overall, organizational attractiveness and structure fairness was higher for those participants in the FTF screening than the

IVR condition. The only factor that seemed to matter to job pursuit intentions was passing or failing the screening with those passing being more interested in pursuing a job.

Implications

In terms of selection, organizations must make trade-offs between efficiencies in screening and applicant reactions. No one method stood out as a clear winner when considering all the procedural justice factors equally. Referring back to Table 1, we again note that while not a focus of the present study, one advantage of IVR is that the "per unit" costs of IVR are lower than those of the other options because labor costs have been eliminated from that screening process. Further, there were no differences in perceptions between IVR and TI, and most comparisons involving IVR and FTF screening were similarly insignificant.

IVR is a "non-interpersonal" screening method so it was not surprising that it was rated lower in terms of interpersonal treatment, two-way communication, and openness, but what is encouraging is that there were no differences between these labor intensive and costly technologies and IVR except for reconsideration opportunity which could easily be remedied with a message explaining how to have results reconsidered. Therefore, there does not appear to be any major negatives in terms of structural fairness among alternative screening devices so organizations can make their choices between screening methods based on other factors such as recruitment strategy or cost.

Finally, screening method did not affect attractiveness or pursuit intentions. On the other hand, there were aspects of fairness that clearly favored the FTF approach over the others. From this, it might be concluded that IVR is a particularly viable screening technique in cases where there are many openings and high applicant volume. The number of openings maximizes the cost benefits, and the high applicant volume minimizes the chances that the negative features of IVR-based screening are reflected in unfilled openings. Where the number of qualified applicants is low, however, an organization might benefit from a more personal touch. The good news is that the IVR option was not perceived in an overly negative light. Applicants preferred the FTF screenings in some cases but did not seem offended by the IVR format. This bodes well for the use of IVR in the future.

Potential Limitations

This study has some potential limitations that should be noted. This is a laboratory study utilizing students. There is some concern in the literature (e.g., Ryan & Ployhart, 2000) that more field research is needed in the area of applicant reactions. While we agree with this sentiment in general, there are aspects of this study that make a field

design less desirable. For example, a major strength of our design was random assignment to conditions, which would be difficult or impossible in the field (and possibly illegal as applicants should not be treated differently for the same job). In addition, assessing legal action is also extremely challenging in the field as few organizations care to raise this issue with actual applicants. Thus, while we do agree that actual applicants introduce greater generalizability, it was not feasible for the current study and our results are consistent with studies on applicant reactions done in the field. Further, a meta-analysis by Anderson, Lindsay, and Bushman (1999) found that across a broad range of domains that laboratory and field-based studies had similar effect sizes. They concluded that the idea that laboratory research is not necessarily low on external validity is false. In the case of our study, while not all students may have imagined themselves as actual job seekers 100%, the issue of whether condition mattered should not have been affected by this lack of fidelity. Finally, our results are consistent with studies on applicant reactions in the field in terms of directions of relationships, etc. Therefore, we do not see this issue as nullifying our results. At the same time, replication of the findings in an appropriate field context would be desirable – perhaps with a quasi-experimental design.

We chose to focus on the screening hurdle of selection. While this is an important stage in selection, it may be that studying other, later stages of selection would have led to different findings. Future research should examine the entire spectrum of selection stages. Another potential limitation was our focus on these three methods. We felt these methods were a nice cross-section of those in use, but we did not include other popular methods such as video interview screenings or web-based screenings. Future research should examine these methods as well.

Conclusion

This study has extended the literature on applicant reactions and screening methods by comparing three ways screening can take place while also examining whether the best applicants react differently to these methods. Our results indicate that organizations can use any of the methods depending upon their goals. IVR was not seen as less fair than FTF and TI screenings on several dimensions of fairness (although clearly not all of them), which is encouraging given the relative cost effectiveness of IVR. Of course, potential users should be careful to note that four of the eleven facets did show that IVR was seen as less fair than at least one other method. Future research should continue to pursue this line of inquiry on the relative merits of different applicant screening technologies as well as conditions under which some of them would be most effective as well as least effective.

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