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Mobile computing technology presents various possibilities and challenges for psychological assessment. Within forensic and correctional psychology, assessment of justice-involved persons facilitated by such technology has not been empirically examined. Accordingly, this randomized controlled experiment involved administering questionnaires about risk—needs, treatment readiness, and computerized technology opinions to a large (N = 212) and diverse sample of individuals under custodial correctional supervision using either a tablet computer or traditional paper-and-pencil materials. Results revealed that participants in the paper-and-pencil condition completed the packet of questionnaires faster but omitted items more frequently. Older participants and those with lower levels of education tended to take longer to complete the tablet-administrated measures. The tablet format was rated as more usable irrespective of demographic and personal characteristics, and most participants across the 2 conditions indicated that they would prefer to use computerized technology to complete psychological testing. Administration format did not have a clear effect on attitudes toward correctional rehabilitation services. Noteworthy for researchers is the substantial time saved and absence of practical problems with the tablet condition. Implications for practitioners include the general usability of the devices, their appeal to incarcerated persons, and the potential for tablets to facilitate clinical and administrative tasks with corrections clients. Considering the novel nature of this study, its promising results, and its limitations, future research in this area is warranted.

Keywords: forensic assessment, correctional psychology, tablet computer, digital technology, data collection

Rapidly evolving digital technologies are becoming ever more accessible and familiar in society, and giving rise to changes and innovations in many areas of psychology (Firth, Torous, & Yung, 2016; Hollis et al., 2015; Jones, 2014). For example, the American Psychological Association (APA) has a division (46) entitled the Society for Media Psychology and Technology. There have been special journal issues dedicated to the topics of "The Technology of Psychotherapy" and "Telehealth and Technology Innovations in Professional Psychology" in APA's *Psychotherapy* and *Professional Psychology: Research and Practice*, respectively. Development of computer-facilitated administration, scoring, and interpretation technologies for psychological assessment has been described as an "enormously successful endeavor" (Butcher, 2003, p. 155) notwithstanding its limitations (e.g., Bow, Flens, & Gould, 2010). Digital devices for measuring and monitoring physiological and neurobiological functioning are also noteworthy.

Compared with applied psychology in general, the specialty areas of forensic and correctional psychology may be advancing more slowly in the adoption of digital technologies to facilitate research and clinical work. This is apparent from the dearth of published scholarly literature on the topic of computerized technology applications for forensic or correctional psychology. There are, however, some noteworthy exceptions.

Gummow (1991) wrote an early article describing the benefits of personal computing for the practicing forensic psychologist, including for storing digital information, analyzing and creating visualizations of data, and cautiously exploring computerized assessments. Computer facilitations are available for certain psychological tests frequently used in forensic mental health assessment,

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as well as for some specialized forensic assessment instruments (Ahern & Faust, 2011; Heilbrun & Brooks, 2010; Otto & Butcher, 1995). However, only two studies could be located that empirically evaluated such technologies in correctional populations (Forbey, Ben-Porath, & Gartland, 2009; Jemelka, Wiegand, Walker, & Trupin, 1992). Computer graphics technology has also been used to modify or create stimuli for assessments of justice-involved persons (hereinafter *offenders*, *prisoners*, or *corrections clients* for brevity) who have committed sex offenses (Dombert et al., 2013; Laws & Gress, 2004; Renaud et al., 2010). Computerized correctional case management software (e.g., SecurManage; http://blog.securmanage.com/) and system evaluation tools (e.g., Risk–Need–Responsivity [RNR] Simulation Tool; Center for Advancing Correctional Excellence!, n.d.) are available, and Vess (2001) provided a descriptive account of a "computer assisted treatment planning and outcome evaluation process" in a forensic mental health hospital (p. 124). Bridging assessment and treatment, Gulati et al. (2016) described the development and piloting of a web-based dynamic violence risk assessment tool and monitoring platform with a sample of individuals with psychosis receiving forensic mental health services in the community.

Telemental health is another technology that is being used with increased frequency to address underserved, logistical, and public safety challenges in forensic mental health and correctional settings (Ax et al., 2007; Batastini, McDonald, & Morgan, 2013). However, in a recent meta-analysis, investigators (Batastini, King, Morgan, & McDaniel, 2016) could only locate three controlled studies. Educators have noted the potential for technology to enhance correctional education services, with promising meta-aggregated results from the few empirical studies with incarcerated youths (Steele, Bozick, & Davis, 2016). Interactive computer simulation (video game) technology has been examined for its risk assessment and reduction potential among offenders with and without mental disorders (Arborelius, Fors, Svensson, Sygel, & Kristiansson, 2013; Hodge et al., 2015; Sygel, Kristiansson, Furberg, & Fors, 2014), and one study examined computer-assisted cognitive remediation therapy in a forensic mental health population (Gallagher, 2014). At least one legal professional has called for the development of smartphone applications to aid offenders in succeeding upon community reentry (Zahorsky, 2013), and correctional officials in Pennsylvania have developed an Internet-based interactive map of reentry services available throughout the state (Tran, 2014). Functionality-restricted tablet computers have also been introduced in correctional institutions to streamline commissary goods ordering and media offerings, facilitate authorized email communications, and enhance security by minimizing the number of available electronic devices (Railey, 2013; Thompson, 2014).

There remain two gaps in the literature that are addressed by the current study. First, there are simple questions that have not yet been systematically or thoroughly examined concerning computerized technology and forensic and correctional psychology. Do digitized administrations of self-report questionnaires save time? Do they reduce the number of skipped, missed, or otherwise unscorable items? Relevant to participant responsiveness to correctional rehabilitation services (e.g., motivation, engagement), do participants prefer computerized test administrations, and might attitudes toward assessment and treatment services improve following use of such technology? Do personal characteristics influence the answers to such questions? Second, the use of *mobile* computing technologies, such as tablet computers, has apparently not yet been empirically examined in a forensic mental health or correctional context. This contrasts with other areas of mental health practice (Berry, Lobban, Emsley, & Bucci, 2016; Donker et al., 2013; Firth, Cotter, et al., 2016; Lindhiem, Bennett, Rosen, & Silk, 2015; Torous et al., 2014), although the research base is underdeveloped throughout applied psychology generally (e.g., Wiederhold, 2015).

The present study involved recruiting and randomly assigning a large, diverse sample of individuals in a custodial community corrections setting to complete either a tablet computer or paper-and-pencil version of an 86-item packet of self-report questionnaires that covered demographic and index offense information, self-perceived criminogenic risk and needs, attitudes toward correctional treatment, and opinions about computing technologies in correctional rehabilitation services. The randomized controlled design was optimal for internal validity, while the recruitment of participants of varying ages, educational backgrounds, ethnicities, sexes, and mental health functioning increased external validity. The diverse composition of the sample also allowed an exploratory examination of relationships among demographic characteristics and dependent variables. Response patterns on the self-perceived criminogenic risk and needs measure, broken out by study condition, were also examined for exploratory purposes. There were five primary study hypotheses.

The first hypothesis was that participants completing digitized and paper-and-pencil questionnaires would do so equally quickly. There was no prior evidence concerning self-report assessment with tablet computers (vs. a traditional desktop computer; cf., Forbey et al., 2009) to suggest that completion time would vary by administration format. The second hypothesis was that participants completing the questionnaires on tablet computers would omit fewer items because the survey software was set up to require that all such items be completed. The third hypothesis was that tablet participants would prefer their condition because the tablets were easier and more enjoyable to use. Given the current popularity, accessibility, and design of tablet computers; the historical reliance upon paper-and-pencil materials for self-report assessment; and the fact that participants at the study site had limited access to computers, it was anticipated that the tablet devices would prove more engaging. The fourth hypothesis was that participants in both conditions would report favorable attitudes about the utilization of computerized technologies in correctional rehabilitation services.

The fifth hypothesis was that participants in the tablet condition would report more favorable attitudes toward correctional treatment. Social psychologists have theorized why, given the right context, small situational manipulations may produce large or persisting effects (e.g., Ross & Nisbett, 2011). For example, brief and timely interventions that involve self-affirmations (writing about personal values) or facilitate enhanced feelings of social belongingness have been found to relate to improved health, interpersonal, and educational outcomes—"benefits that sometimes persist for months and years" (Cohen & Sherman, 2014, p. 333; Walton & Cohen, 2011). Thus, the logic of the fifth hypothesis was that presenting a potentially engaging tool in an otherwise austere

setting might channel slightly improved attitudes toward correctional rehabilitation services in general, or the sophistication and quality of assessment and treatment services at the study site specifically.

Method

Participants

Any corrections client at the study site who (a) resided on one of the three units where recruitment occurred, and (b) could communicate in English met inclusion criteria for participation eligibility, unless that individual had participated in a previous study using any of the present measures ($n = 1$). The three units from which participants were recruited were, respectively, comprised of general population male state prisoners, general population female state prisoners, and male state prisoners with mental health treatment needs that could be met in a community correctional setting (Table 1).

A total of 212 participants provided data, collected between April 2014 and March 2015. A power analysis (G*Power 3.1.9.2; Faul, Erdfelder, Lang, & Buchner, 2007) using the obtained effect sizes and Bonferroni-adjusted significance levels indicated that all the primary analyses except the correctional treatment attitudes contrasts (βs of .04 and .48) were sufficiently powered (i.e., βs > .80) using the following power analysis parameters: two-tailed *t* test, $d = 0.3$, $\alpha = .05$, $\beta = .80$.

The study used a cross-sectional randomized controlled experimental design. Random assignment of individual participants to the tablet computer or paper-and-pencil condition was facilitated using a random number generator (https://www.random.org/). To equalize the size of the two conditions at the end of data collection, the last eight participants were all assigned to the tablet condition.

Procedures

The study proceeded after approval from the Drexel University Institutional Review Board and the New Jersey Department of Corrections Departmental Research Review Board, and permission from the study site. Participants were recruited via in-person solicitation at a privately operated community corrections facility in New Jersey. Corrections clients were at the secure facility for an initial assessment and assignment, or reassessment and possible reassignment, to a community-based halfway house. Study announcements were delivered to large groups of facility residents gathered in lecture halls, and individuals who expressed interest later met in small groups with the investigators. These small groups were used to provide individuals with additional information necessary for informed consent and to administer study measures to those who agreed to participate. Responses to study measures were used exclusively for research purposes; this information was not made available to facility staff. Participants were not offered payment for their participation. In total, 292 names were provided on the study sign-up sheets; the 80 individuals (27%) who were not in the final sample could not be met with due to scheduling issues, attempted to sign up twice, declined to participate, or discontinued before completing the study measures.

Measures

Risk Need Perception Survey (RNPS). This measure was developed to appraise self-perceived criminogenic needs (Holliday, King, & Heilbrun, 2013), as informed by the risk-need-responsivity model (Andrews & Bonta, 2010), and has since been revised to measure self-appraised criminogenic risk (King, 2016). The measure includes 31 items that reflect the Central Eight risk factors, other covariates of criminal recidivism, responsivity factors, and items that are unrelated to reoffending (e.g., physical attractiveness). Respondents are first asked whether they consider any of the items to be a problem in enhancing their risk for committing a new crime. Responses are provided on a 5-point Likert-type scale ranging from *very small* to *very big*. For most of the items, respondents are also asked whether they would be more likely to commit a crime in the future if the area described by the item does not change. In addition to the 31 primary items, respondents are also asked about their self-appraised risk, both categorical (very low, low, medium, high, and very high) and probabilistic (percent out of 100). Finally, respondents are asked whether they have any other risk-relevant problem areas, and whether these have the potential to change (see King, 2016 for a discussion of the RNPS's psychometric properties).

Corrections Victoria Treatment Readiness Questionnaire (CVTRQ) Attitudes and Motivation subscale. The CVTRQ (Casey, Day, Howells, & Ward, 2007; Day, Casey, Ward, Howells, & Vess, 2010) is a questionnaire designed to measure offender readiness for correctional treatment. Individual CVTRQ items map onto four subscales that were derived via principal components analysis: Attitudes and Motivation, Emotional Reactions, Offending Beliefs, and Efficacy. Responses are made on a 5-point Likert-type scale. The six items comprising the Attitudes and Motivation (a.m.) subscale were administered in the present study. Higher scores on this subscale are associated with better attitudes and motivation to participate in and benefit from correctional treatment. The CVTRQ has been found to exhibit high levels of internal consistency, convergent validity, discriminant validity, and predictive validity, while the a.m.subscale has shown good convergent validity when considered independent of other CVTRQ subscales and the total readiness index score (Casey et al., 2007).

Additional attitudinal, administration format usability, and technology opinions items. Participants were also asked about several items specific to the study site (Table 2), using the same response options as the CVTRQ. Given the focus on computerized technology, participants were also asked about the usability of their respective administration format, as well as their opinions on the use of computerized technologies in correctional rehabilitation services (see Table 2).

Recording of responses. Time to completion (in seconds) was recorded for each participant. Number of blank responses and number of unscorable responses were also recorded for participants in the paper-and-pencil condition. These latter two variables were not relevant to participants in the tablet condition because the software did not permit respondents to skip any items, and it also ensured response selections were unequivocal.

The 86 questionnaire items were presented as part of two forms. The first form was titled "Risk Need Perception Survey" and consisted of six multiple-choice demographic questions and one

Table 1
Sample Demographic and Other Relevant Characteristics

Characteristic	*n*	%
Condition		
Tablet computer	106	50.00
Paper and pencil	106	50.00
Facility unit		
General population men	139	65.57
General population women	46	21.70
Mental health men	27	12.74
Sex[a]		
Male	158	74.53
Female	44	20.75
Missing	10	4.72
Race–ethnicity[b]		
American Indian or Alaska Native	3 (9)	1.42
Asian	0	.0
Black or African American	108 (122)	50.94
Hispanic	35 (46)	16.51
Native Hawaiian or other Pacific Islander	1 (2)	.47
White	42 (47)	19.81
Two or more ethnicities	23 (15)	10.85
Age[c]	$M = 33.80$, $SD = 10.73$, range = 18–63	
Education level[d]		
No high school and no equivalency diploma	9	4.25
Some high school and no equivalency diploma	43	20.28
Finished high school or earned equivalency diploma	89	41.98
Some college	55	25.94
Obtained college degree	15	7.08
Missing	1	.47
Marital status[e]		
Single–not married	166	78.30
Married (legally)	27	12.74
Separated (legally)	2	.94
Divorced	11	5.19
Widowed	4	1.89
Missing	2	.94
Primary index crimes[f]		
Drugs or alcohol	84	39.62
Property	46	21.70
Firearms	54	25.47
Against a person	43	20.28
Violation of supervision	16	7.55
Other	11	5.19

Note. Participants could endorse that they were multiethnic as well as select the individual ethnicities that contributed to their multiethnic identity. The number of additional individual ethnicity frequency counts for multiethnic participants are provided in parentheses. Participants were also able to endorse more than one primary index offense type. Thus, the percentages for primary index crimes add up to more than 100%. Confidence intervals reported in this table's notes are for the effect sizes unless otherwise indicated. φ = phi; V = Cramer's V.

[a] Stratifying by study condition resulted in a significant difference, $\chi^2(1, N = 202) = 4.32$, $p = .04$, $\varphi = -.15$, 95% CI [−.28, .00]. Specifically, of the 202 participants who reported their sex, 61.4% in the paper-and-pencil condition were female and 56.3% in the tablet condition were male. [b] Collapsing the categories into Black or African American, Hispanic, White, and other ethnicity or multiethnic, and stratifying by study condition, approached a significant omnibus difference, $\chi^2(3, N = 212) = 7.26$, $p = .06$, $V = .19$, 95% CI [.12, .32]. Specifically, 53.7% of participants in the tablet condition were African-American, 62.9% of participants in the tablet condition were Hispanic, 64.3% of participants in the paper-and-pencil condition were White, and 59.3% of other ethnicity or multiethnic participants were in the paper-and-pencil condition. [c] Stratifying by study condition did not result in a significant difference, $t(185) = -1.53$, $p = .13$, $d = -.23$, 95% CI [−5.53, .70] for the unstandardized mean difference, 95% CI [−.52, .06] for the standardized mean difference. [d] Collapsing the categories into no high school or equivalency diploma, high school or equivalency diploma, and at least some college, and stratifying by study condition, did not result in a significant omnibus difference, $\chi^2(2, N = 211) = .40$, $p = .82$, $V = .04$, 95% CI [.10, .17]. The confidence interval artifact resulted from the use of the formula in Smithson (2003) for transforming the confidence interval of the noncentrality parameter of the asymptotic noncentral χ^2 distribution to a confidence interval for Cramer's V. [e] Collapsing the categories into married or unmarried, and stratifying by study condition, did not result in a significant difference, $\chi^2(1, N = 210) = .02$, $p = .88$, $\varphi = .01$, 95% CI [−.13, .15]. [f] Stratifying by study condition resulted in a significant difference for the violation of supervision category only, $\chi^2(1, N = 212) = 6.76$, $p < .01$, $\varphi = -.18$, 95% CI [−.26, −.03]. Specifically, 81.3% of participants whose index offense was a violation of supervision were in the paper-and-pencil condition. Effect sizes (φ) for the other primary index crime variables ranged from −.06 to .02.

Table 2
Additional Attitudinal, Administration Format Usability, and Computerized Technology Opinion Items

Additional attitudinal items
The assessment and treatment at places like this is pretty sophisticated/advanced.
The assessment and treatment staff at places like this know what they're talking about.
The assessment and treatment staff at places like this are caring, warm, and committed to helping me.
The assessment and treatment staff at places like this are encouraging of me.
The assessment and treatment staff at places like this are not easy to con.
Administration format usability items:
In filling out the survey, I found the [iPad or paper and pencil] version of the survey to be easy to use.
In filling out the survey, I found the [iPad or paper and pencil] version of the survey to be understandable.
In filling out the survey, I found the [iPad or paper and pencil] version of the survey kept my attention.
In filling out the survey, I found the [iPad or paper and pencil] version of the survey to be fun/enjoyable to fill out.
Computerized technology opinion items
I would have preferred to use [paper and pencil or a tablet computer (iPad)] to fill out this survey.
I would have preferred to use a regular computer to fill out this survey.[a]
I would be open to using a computer or tablet computer (like an iPad) to complete other testing materials (rather than paper and pencil).
I would prefer to use a computer or tablet computer (like an iPad) to complete other testing materials (rather than paper and pencil).
I would recommend that more computers and tablet computers (like iPads) be used in treatment programs.

Note. All items had the following response options: *strongly disagree*, *disagree*, *unsure*, *agree*, and *strongly agree*. Responses were scored 1 (*strongly disagree*) to 5 (*strongly agree*). Thus, the range of possible scores was 5–25 for the additional attitudinal index and 4–20 for the usability index.
[a] This item was unintentionally omitted from the tablet condition for the first 69 participants, discussed in more detail in the Limitations section.

"other response" specification line, 57 multiple-choice RNPS items, and three free-response RNPS items. The second form was entitled "Risk Need Perception Survey Feedback" and consisted of six multiple-choice CVTRQ items and 14 multiple-choice attitudinal, format usability, and technology opinions items.

Second-generation Apple iPads (Apple iPad 2) were used as the tablet computers. The devices were password protected. Internet connectivity was disabled while interacting with participants, as were most of the default applications included on the tablets. The Qualtrics Surveys iOS application (Qualtrics Labs, 2014–2015) was used to digitize the study measures for the tablet condition. Software settings required participants to answer a page of questions before proceeding to the next page, and permitted only one response per question. The survey application automatically recorded tablet participants' completion time. For paper-and-pencil participants, researchers used an iOS stopwatch application to record time (Pinetree Software, 2014–2015), and manually recorded responses that were unscorable. Individual participant responses for those in the tablet condition were stored locally on the devices and later uploaded to a secure, password-protected cloud-based Qualtrics account, from which data could be exported into a variety of file formats for analysis.

Prior to working with participants, all researchers involved in data collection (two undergraduate and two graduate students) were trained to use the tablet computers and relevant software, as well as to administer the questionnaires. This enabled them to readily administer study materials, respond to any participant questions, and assist participants with technical difficulties. Paper-and-pencil data were double entered (by two undergraduate students and the first author) to detect and correct any data entry errors.

Statistical Method

Descriptive statistics and two-tailed *t* tests were used to evaluate the primary study hypotheses that involved contrasting the two study conditions for which individual-level data was aggregated. In addition, two-tailed *t* tests and chi-square tests for independence were used to assess the effects of random assignment. Finally, two-tailed *t* tests; one-way analysis of variance, Tukey's honestly significant difference tests, and the Games-Howell procedure; Pearson's correlations and Spearman's rank correlations; and a chi-square test for independence were used to examine relationships among demographic characteristics and dependent variables, and to compare RNPS scores for the two study conditions. Effect sizes accompany all reported analyses.

There were five primary hypotheses. Given the number of comparisons required, we established an a priori Bonferroni-adjusted significance level of .01 (.05 ÷ 5) for primary analyses. Pairwise deletion was used to minimize the impact of missing data across analyses (few cases were missing for primary analyses; no more than 24% of cases were missing for any exploratory analyses).

Results

The two study conditions each included 106 participants. Analyses revealed that random assignment controlled several potential differences. There were no significant differences between the conditions with respect to age, educational level, marital status, and most primary index offense types. However, there were significant differences for sex and one offense type, and a difference that approached significance for race—ethnicity (see Table 1). For efficiency purposes, data were collected in small groups, thereby partially violating the assumption of independence of observations (i.e., participants assigned to one condition could see those assigned to the other). Otherwise, assumptions for statistical tests were either met or offset by study design features or the use of alternative statistical tests (i.e., Welch's *t* test and Welch's *F*).

Primary Analyses

Details of primary analyses are provided in Table 3. Paper-and-pencil participants completed the questionnaires significantly

Table 3
Study Condition Contrasts

Dependent variable	Condition *M* (*SD*)						
	P&P	Tablet	*df*[b]	*t*	*p*	Cohen's *d*	95% CI[c]
Completion time	11′ 23″ (3′ 59″)	15′ 29″ (5′ 58″)	183.01	−5.86	<.01	−.81	[−5′ 28″, −2′ 42″]
Omissions–unscorable responses	.65 (2.52)	.00 (.00)	105.00	2.67	<.01	.37	[.17, 1.14]
Usability composite (4–20)	14.37 (3.11)	18.33 (2.69)	210	−9.92	<.01	−1.36	[−4.75, −3.18]
CVTRQ AM (6–30)	24.57 (3.42)	24.97 (3.19)	210	−.89	.37	−.12	[−1.30, .49]
Attitudinal composite (5–25)	14.07 (4.07)	15.42 (3.61)	210	−2.55	.01	−.35	[−2.39, −.31]
RNPS Central Eight risk factors endorsements (0–8)	5.50 (2.02)	5.86 (2.13)	209	−1.27	.20	−.17	[−.93, .20]
Level of RNPS Central Eight risk factors endorsements (0–32)	9.96 (5.50)	10.47 (5.93)	209	−.65	.52	−.09	[−2.06, 1.04]
Probabilistic criminogenic risk (0–100)[a]	33.96 (36.51)	38.89 (34.79)	209	−1.00	.32	−.14	[−14.60, 4.75]

Note. The paper-and-pencil condition was used as the reference group for all analyses; thus, negative signs indicate that the paper-and-pencil condition yielded a lower mean value relative to the tablet computer condition. P&P = paper-and-pencil condition; CI = confidence interval; Usability composite = index of administration format usability items; CVTRQ AM = Corrections Victoria Treatment Readiness Questionnaire Attitudes and Motivation subscale; Attitudinal composite = index of additional attitudinal items; RNPS = Risk Need Perception Survey; ′ = minutes; ″ = seconds.
[a] The means and standard deviations for categorical risk level (1 = *very low*, 2 = *low*, 3 = *medium*, 4 = *high*, 5 = *very high*) were 2.13 (1.37) for the paper-and-pencil participants and 2.58 (1.51) for the tablet participants, respectively. The results of a chi-square test for independence only approached significance before a Bonferroni correction, $\chi^2(4, N = 212) = 8.63$, $p = .07$, $V = .20$, 95% CI [.14, .34]. A possible trend was observed at the higher risk levels: 6.6% and 10.4% of paper-and-pencil participants selected the high and very high risk categories, respectively, while 16.0% and 16.0% of the tablet participants selected those respective risk levels. [b] Degrees of freedom reported as decimal numbers indicate that a Welch's *t* test (unequal variances *t* test) was used rather than a Student's *t* test (equal variances *t* test). [c] The confidence intervals reported in the body of this table are for the unstandardized mean differences. The confidence intervals for the standardized mean differences are as follows: $d = -.81$, 95% CI [−1.09, −.53]; $d = .37$, 95% CI [.09, .64]; $d = -1.36$, 95% CI [−1.66, −1.06]; $d = -.12$, 95% CI [−.39, .15]; $d = -.35$, 95% CI [−.62, −.08]; $d = -.17$, 95% CI [−.44, .10]; $d = -.09$, 95% CI [−.36, .18]; and $d = -.14$, 95% CI [−.41, .13].

faster than tablet participants—by about four minutes, on average. This was a large effect. Thirty paper-and-pencil participants omitted an item or gave an unscorable response (typical range of zero to four instances vs. zero for the tablet participants), resulting in a small- to medium-sized mean difference that was significant. Participants in the tablet condition rated this condition significantly more favorably—that is, a composite of items on ease of use, understandability, interestingness, and enjoyableness—by an average of about 4 points on a 4 to 20 scale. The magnitude of this effect was large. Few tablet participants would have preferred to complete the questionnaires via paper and pencil (3.8%) or were uncertain (5.7%), and most paper-and-pencil participants would have preferred to use tablets (72.4%), although 21.9% were undecided. The majority of participants in both conditions indicated that they would prefer to complete other testing using computerized technology (paper-and-pencil condition = 72.6%, tablet condition = 95.3%), and that they would recommend that more computing technologies be incorporated into correctional treatment (paper-and-pencil condition = 85.7%, tablet condition = 95.3%). Tablet participants did not report significantly or sizably more favorable general attitudes about correctional rehabilitation than paper-and-pencil participants on the CVTRQ a.m. However, the difference between the conditions was nearly significant when the more study site-specific experimental attitudinal items were indexed, with the tablet participants providing higher average ratings of a small-to-medium magnitude.

Secondary Analyses

Exploratory analyses regarding the relationship of personal characteristics to certain dependent variables were also conducted (Table 4). Statistically significant results are highlighted here. Age was significantly positively associated with completion time for the tablet condition, and the administration format usability index for the paper-and-pencil condition. These were both approximately medium-sized effects. Level of education only approached a significant negative relationship with completion time for the paper-and-pencil condition, whereas it was significantly negatively related to completion time for the tablet condition. These effects were small in magnitude. The modestly lower usability ratings reported by men in the paper-and-pencil condition approached significance.

An omnibus test of completion time by participants of different ethnicities (collapsed to Black–African American, Hispanic, White, and other ethnicity—multiethnic) in the tablet condition approached significance before a Bonferroni adjustment. Significant differences among ethnic categories were also observed for items concerning the preference to have had completed the questionnaires using paper and pencil, and recommendation that more tablets and computers be used in correctional treatment programs. Although these were small- to medium-sized effects, post hoc contrasts for one significant omnibus result did not reveal any significant differences in head-to-head comparisons. In the other two cases, post hoc contrasts suggested that Black–African American participants, relative to White participants, endorsed a moderately higher preference to have had completed the questionnaires using paper and pencil, while Hispanic participants, again relative to White participants and to a modestly higher degree, recommended more incorporation of tablets and computers in correctional rehabilitation services.

Participants from the male mental health unit ($n = 27$) were rarely assigned to the paper-and-pencil condition ($n = 5$), so we did not compare completion times or indexed administration for-

Table 4
Personal Characteristics Analyses

Dependent variable	Independent variable				
	Age (ES = *r* or ρ)	Sex (ES = *d*)	Ethnicity (ES = ω^2 or est. ω^2)	Education level (ES = ρ)	Unit (ES = *d*)
Completion time (paper and pencil)	.06 (*r*)	.25	.003 (ω^2)	−.22[g]	
Completion time (tablet)	.26 (*r*)[a]	.04	.05 (ω^2)[d]	−.37[h]	−.17
Usability composite (paper and pencil)	.37 (*r*)[b]	−.41[c]	.01 (ω^2)	.14	
Usability composite (tablet)	−.07 (*r*)	−.04	.02 (ω^2)	.12	.16
Paper and pencil—would have preferred	.13	−.29	.09[e]	−.10	−.23
Tablet computer—would have preferred	.03	.16	−.005	−.03	
Regular computer—would have preferred	.06	−.29	−.004	.05	−.68[i]
Tablet or regular computer—future willingness	.06	.10	.01 (ω^2)	−.002	.23
Tablet or regular computer—future preference	.07	.08	.03	.06	.36[j]
Recommend more tablet and regular computers	−.01	−.05	.05[f]	.03	.23

Note. The reference group for sex was male and for unit was mental health unit; thus, negative Cohen's *d*s indicate that men and participants from the mental health unit, respectively, yielded comparatively lower average values. Confidence intervals reported in this table's notes are for the effect sizes. ES = effect size; *r* = Pearson's correlation coefficient; ρ = Spearman's rank correlation coefficient; *d* = Cohen's standardized mean difference; ω^2 = ω squared; est. ω^2 = estimated omega squared = *df* between (Welch's $F - 1$)/*df* between (Welch's $F - 1$) + *N*.
[a] $r(104)$, $p < .01$, 95% CI [.07, .43]. [b] $r(79)$, $p < .01$, 95% CI [.17, .54]. [c] Men ($M = 14.06$, $SD = 3.37$) < women ($M = 15.33$, $SD = 2.25$), $t(70.79) = -2.15$, $p = .04$, 95% CI [−.86, .04]. [d] Black–African American ≈ Hispanic ≈ White ≈ other ethnicity–multiethnic; however, $F(3, 102) = 3.00$, $p = .03$, 90% CI [.00, .16]. [e] Welch's, $F(2, 43.07) = 4.70$, $p = .01$, 90% CI [.02, .33]; Black–African American ($M = 1.69$, $SD = .90$ > White ($M = 1.20$, $SD = .41$), Games-Howell procedure $p = .01$, $d = .59$, 95% CI [.02, 1.17]. Data from the 11 multiethnic or other ethnicity cases for which there was data for this dependent variable had to be removed from the analysis due to a lack of variance. [f] Welch's, $F(3, 77.24) = 4.04$, $p = .01$, 90% CI [.02, .24]; Hispanic ($M = 4.80$, $SD = .47$ > White ($M = 4.24$, $SD = 1.03$), Games-Howell procedure $p = .01$, $d = .68$, 95% CI [.22, 1.14]. [g] $\rho(103)$, $p = .03$, 95% CI [−.40, −.03]. [h] $\rho(104)$, $p < .01$, 95% CI [−.52, −.19]. [i] Mental health unit ($M = 2.47$, $SD = 1.35$) < general population units combined ($M = 3.33$, $SD = 1.26$), $t(140) = -2.74$, $p < .01$, 95% CI [−1.17, −.19]. [j] Mental health unit ($M = 4.63$, $SD = .57$) > general population units combined ($M = 4.29$, $SD = .99$), $t(53.28) = 2.62$, $p = .01$, 95% CI [−.05, .76].

mat usability values for paper-and-pencil participants in the different units. However, compared with male and female participants recruited from general population units (collapsed into a single group), participants with a mental health status endorsed a significantly lower preference to have had completed the questionnaires on a regular computer, and higher preference to use a tablet computer to complete psychological testing in the future. These were medium- and small-sized effects, respectively.

Finally, exploratory analyses regarding the relationships among study condition and RNPS scores were conducted as an indirect examination of the impact of administration format on response style (see Table 3). Specifically, of interest was whether the tablet participants tended to endorse more criminogenic risk factors or report a higher risk of reoffending relative to the paper-and-pencil participants. There were no significant differences between the study conditions for the number of risk factors endorsed, the overall level of risk factors endorsed, overall categorical risk level, or point-estimated probabilistic risk.

Discussion

This was apparently the first randomized controlled study to examine tablet computer-facilitated self-report assessment with incarcerated individuals. It raises numerous questions about potential opportunities and limitations. Somewhat unexpectedly, participants in the paper-and-pencil condition completed the study materials faster than those in the tablet condition. The large standardized mean difference, and 95% confidence interval suggesting an approximately 3- to 5-min difference for completion of 86 self-report items, was considered good evidence of nonequivalency, and so further equivalency testing procedures were not undertaken. During study debriefings, a few participants noted that it would have taken them longer to fill out the paper-and-pencil materials if they had been required to use a bubble answer sheet, rather than just circling or making a mark in the response boxes that had been provided for questions. Also, age was related to completion time only for the tablet condition (older participants tended to take longer), and level of education was only clearly related to completion time for the tablet condition (individuals with lower levels of education tended to take longer). These effects may be related to greater familiarity and comfort with tablet computers among younger persons with higher educational achievement.

It was hypothesized that participants completing the questionnaires via tablets would omit significantly fewer items, with the survey software ensuring that the paper-and-pencil condition would be contrasted with a mean of zero. Results were consistent with this hypothesis. Participants filling out the questionnaires with paper and pencil tended to accidentally omit or otherwise provide an uninterpretable marking for one or more items. The ability to ensure that participants do not unintentionally skip any items, and the unequivocal recording of responses, is a clear advantage of computer-facilitated assessment technology. It was also hypothesized that participants in the tablet condition would rate their administration format more favorably in terms of usability (easy to use, understandable, kept one's attention, and enjoyable). This was supported. Those in the tablet condition rated their format much more favorably than did paper-and-pencil participants. Notably, among tablet participants, usability ratings did not vary based on demographic or personal characteristics, suggesting that tablet-facilitated assessment may be appropriate for offenders

of differing ages, levels of education, ethnic backgrounds, sexes, and mental health functioning.

Results provided support for the next hypothesis: that participants in both conditions would report favorable attitudes about the use of computerized technology in correctional rehabilitation services. Most participants in both conditions preferred (or would have preferred) to complete the study questionnaires using the tablet devices. The same was true for the preference to use tablets or other computers for future assessment. In addition, most participants, irrespective of condition, recommended increased incorporation of computing technologies into correctional rehabilitation. The few ethnic differences observed in relation to technology opinions were modest in magnitude. Also, response patterns on the RNPS did not differ by administration format. These results collectively suggest that digital technology may hold potential for increasing individuals' engagement in correctional assessment and treatment services.

The final hypothesis was that participants in the tablet condition would report significantly more favorable attitudes about correctional rehabilitation. Although results could be interpreted conservatively as having failed to support this hypothesis, a nearly significant difference was observed in favor of the tablet condition on the ad hoc but more specific attitudinal items (vs. the validated but general-natured CVTRQ). Although this effect size was modest, participants had only a single, brief opportunity to interact with the tablets. It may be that greater effects on attitudes toward correctional rehabilitation services might result from providing offenders with more opportunities to use computerized technology.

We note that there were no problems in using this equipment. Administrators may be concerned about corrections clients harming valuable equipment, or using it inappropriately (e.g., to access the Internet). No equipment was harmed or stolen. It was also straightforward to disable the tablets so that they could not be used for purposes beyond the intended study, and to password protect the devices against having this functionality restored by participants.

Implications for Researchers and Clinicians

For researchers, we note that receiving approval to introduce tablets into the study facility for use with incarcerated individuals required only one additional step: signing a property damage liability release. The survey software allowed us to store results locally for later uploading to cloud storage once offsite. Facility residents seemed interested in participating because it offered the potential opportunity to use a tablet. Attempts to misuse the devices (e.g., trying to enable the Internet) were infrequent (and unsuccessful). Perhaps the most significant finding for researchers is the data entry and checking time we saved—a few minutes for the tablet condition versus more than 25 hr for the paper-and-pencil condition. Thus, researchers should consider taking advantage of computerized technologies in their studies, as our experiences were certainly encouraging.

For practitioners, it is noteworthy that participants took significantly longer to complete the questionnaires using the tablet computers, although this may have been attributable to the fact that participants were not required to use a bubble answer sheet. This seems likely (Forbey et al., 2009). However, the tablet software enabled us to ensure that no items would be omitted or unintentionally skipped. Although some older participants needed minor assistance in using the tablets, all tablet participants successfully completed the digital questionnaires. As a group, they gave the digital format higher ratings in terms of usability. Importantly, tablet usability ratings did not differ as a function of demographic characteristics and mental health status, nor did administration format relate to response patterns on the RNPS. Most participants also indicated that they would be willing to use computers more in correctional treatment services—indeed, they would prefer it. This suggests the potential for increasing engagement in correctional rehabilitation through the use of computerized technology. Furthermore, there are numerous tasks that would be facilitated by the portability and power of tablet computers. It is time to consider this seriously.

Directions for future research on digital technology in forensic and correctional psychology are innumerable. Next steps that would build upon the present study include the following. One direction would be to continue to examine the equivalency or nonequivalency of different desktop and portable computer setups, software delivery systems, and paper-and-pencil formats in assessing forensic and correctional populations. To this end, future research on the impact of computerized assessment on examinee response styles, utilizing embedded or stand-alone response style measures, would be especially welcome. Another future direction would be to survey practitioners and administrators about digital technologies that are currently being utilized in their work or settings, in part to identify technological tools in need of empirical validation. Surveying relevant professionals about job tasks or service areas that they perceive to need new technological solutions would likewise be worthwhile.

A third direction for future research would be to continue to adapt or develop more computerized technologies for implementation in forensic and correctional psychology services, and then evaluate the effects on different outcomes of interest. Relevant outcome metrics might pertain to forensic and corrections clients, service providers, and service systems. For example, portable computer technology may, by various means, measurably enhance service provider and system efficiency; "serious" game technology (e.g., realistic, service-relevant, and interactive computer simulations) might contribute unique information to the assessment process and increase engagement in treatment; and software applications for mobile devices ("mobile apps") may help to maintain treatment gains made in an institutional setting upon reentry or release to the community. Increased collaboration with computer scientists to identify technology solutions that could be repurposed, or potential ones that might be developed, to address need areas will likely prove fruitful. Moreover, the need for technical know-how (e.g., software engineering) will often make these collaborations necessary.

Limitations and Conclusions

The following study limitations were considered the most threatening to internal validity. First, random assignment procedures were violated for a small minority of participants. Second, some of the assumptions for statistical tests were wholly or partially violated (i.e., no fully random sampling, nonindependence of observations, and some dependent variables were not normally distributed). Third, some analyses were underpowered. Fourth, a

question that had been erroneously omitted from the tablet version of one of the study questionnaires (regarding whether one would have preferred to have had completed the questionnaire using a regular computer) was added to the tablet condition midway through the study, which may have modestly affected completion times. The study limitations that likely most affected external validity were the lack of recruitment of participants with severe mental illness, use of a measure that was generally experimental in nature (as compared with use of a better validated self-report questionnaire), and the lack of a desktop or laptop computer condition (although some commonly used self-report measures in forensic and correctional psychology, such as the Minnesota Multiphasic Personality Inventory [MMPI]–2; Butcher et al., 2001, can be administered using tablet computers; Pearson Education, n.d.).

Since there is little research examining the potential of computerized technology for forensic and correctional psychology research and practice, this study was among the first of its kind. Notwithstanding its limitations, the results offer a starting point for future investigations and potential applications of computerized technology in forensic and correctional psychology. It provides information that will be needed to persuade forensic mental health and corrections clinicians and administrators of the safety and benefits of incorporating digital technologies where appropriate. There may be numerous advantages to thoughtfully integrating digital technology into forensic mental health and correctional contexts, including increasing engagement, decreasing the time required for data collection, decreasing transfer errors of physical data to digital databases, and decreasing the use of paper. The potential for using digital technology in forensic and correctional psychology is far greater than has been its application to date. Thoughtful use of such technology has enormous promise for improving the quality of research, assessment, treatment, and documentation in work with justice-involved individuals.

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