

Can Remote Proctoring and Test Center Proctoring Live in Harmony? A Comparison of Statistical Outcomes and Examinee Experience

Robin L. Bissinger, PhD, APRN, NNP-BC, FAAN

Chief Executive Officer

National Certification Corporation

Amin Saiar, PhD

Vice President, Psychometrics

PSI Services



Overview

In the first half of 2020, NCC engaged in NCCA's Remote Proctor Pilot Study

- NCC offered the choice to candidates to take the EFM exam in Test Centers (TC) or with Remote Proctoring (RP)
- NCC and PSI performed a comparison of outcomes to evaluate whether RP is a viable proctoring modality long-term

Study Objectives

- Compare the psychometric properties of scores obtained with live remote proctoring (RP) to the same examinations administered in test centers (TC) with onsite proctors
- Describe the examinee perceptions of testing conditions between remote-proctored testing compared to traditional test site conditions

Background on Remote Proctoring

Remote Proctoring is not without controversy or criticism, but the effects of a global pandemic have accelerated its use

Remote Online Proctoring was first used in distance education and now being used for credentialing

Advancements in technology focused on secure assessment delivery have allowed remote proctoring to become a viable option for high-stakes testing

Still, there is little published research examining remote online proctoring and the effects on test scores and the examinee experience

Certification Program Studied

Subspecialty Certification launched in 1997

More than 35,500 currently certified

Required by many hospitals across the country

Consists of 100 scored items and 25 pretest items

English language only

120 minutes administration time

Same Test Form

Same test delivery driver used

Elimination of scratch paper with a move to comment box area for each question

Onscreen calculator

Administrations of NCC's Electronic Fetal Monitoring (EFM) were studied

Eligibility: Licensed health care professionals in the US and Canada who utilize the application of EFM and interpretation of data obtain to provide care to obstetrical patients in both inpatient and outpatient settings – including MD/DO, House staff, CNP, CNM, CM, RN, PA, or Paramedic

Changes in Process

Here were a few areas that necessitated critical process changes

Policies and Procedures

- Proctoring Modalities Identified
- Software: PSI Bridge
- Proctors' Administration Rules
- Exam Security

Relationship with Vendor

- Weekly Implementation Meetings
- Monitoring of Statistical Outcomes
- No Changes to COI & NDA Agreements
(All Proctors Sign COI and Non-Disclosure Agreement Already)

Technology Configurations

- Move to New Scheduling System was Needed
- New API to Transmit Candidate Date was Developed
- Single Sign-On was Implemented

Communication to Candidates

Emails out to all EFM candidates who were already registered when the study was approved by NCCA

- Extension of eligibility windows for opportunity to test using LRP

Computer specifications and technical requirements including audio and video were posted for both MAC and PC users

- Compatibility test link
- Webcam Test link

Launch of a recruitment program for EFM certification using LRP

- Audience, message, and tactics were defined
 - Pilot program to compare different testing methods for certification exams
- Marketing and notification about LRP and EFM research

Second-Chance-Free Promotion

- If you took the exam using LRP and were not successful, retake the exam at a computer test site after a 90-day period at no cost

Administration Period

Test Center

Test Centers closed between
March 20 and mid-May

Remote Proctored

Remote Proctoring became
available on April 1

Candidates were free
to choose either
modality (when that
modality was available)

Due to pandemic, both
proctoring options
were not available
during the whole
period studied

Candidates who
experienced issues
with RP process were
directed to TCs

Security Measures

Lock-Down Browser

(NO copy, paste, screen capture, access other sites, use instant messaging, or run remote access/virtual machines)

Microphone and Webcam Check

Candidate Authentication, using valid identification

Camera Panning and Room Scan

Proctor goes over all the exam rules and trouble shoots technical problems

Exam Session, including chat log, is recorded

Encrypted Data Transfer

Enforcing the Rules

With guidance from PSI, NCC determined which rules to implement and whether it was a minor infraction (warning) or major infraction (end of session)

Minor

Candidate has another electronic device present in the room
Candidate is not focusing eyes on the screen
Candidate moves temporarily out of the cameras line of sight

Major

Use of abusive language out loud or via chat
Candidate places an object over the camera and obstructs the proctor's view
Someone enters the room

Proctoring and Quality Assurance

PSI's Trained Remote Proctors

Proctor Qualifications ensuring no involvement or vesting interest in the certification program or with the candidate taking the exam

1 proctor to 4 candidates maximum

Live monitoring and use of scripting

Termination Script for Major Violations

Use of both Chat and audio

Proctor Incident Log

PSI QA and Channel Security Teams

Review Recordings internally at PSI

NCC is notified of any incident and can review recording, proctor incident log, and chat log

Perform random audits

Ongoing record of all incidents and outcomes

Issues Experienced

Pandemic's Impact

Moving organization completely online and away from office environment

Weekly Team meetings, new lines of communication, team chat, social chat, and email

Immediate in-demand “product” of on-line testing

Demand that grew to at least 400% of what was expected at that time

Mass use of the internet

Hire and training of proctors to meet demand

Increased demand impact on proctor scheduling

Issues Experienced

Technical Issues

Monitor transfer of answer strings delivery from PSI to NCC

Delay due to a programmatic feature: Submit button on exam had to be clicked by candidate (3% experienced this issue)

QI: auto-submit function runs nightly

Monitor transfer of registration information to PSI

Testing Issues new to NCC Staff such as audit records and review of proctor logbooks

Integration of the PSI portal with single sign-on:
Missing schedule links in their accounts (4% experienced this issue)

Exam Start Delays

Average wait time to connect to a proctor was 31.8 minutes

46% within 20 minutes

54% outside this window

Candidates were told after 30 minutes they could request a reschedule (12% choose this option)

Implemented QI on 5/31 with increase in number of proctors and improved scheduling

Average wait time 13.3 minutes (80% of candidates)

20% with delays more than 20 minutes

Results

Infractions

Out of 892 administrations, we had only 19 infractions

18 Minor infractions

1 Major infraction:

- Candidate asked someone to come into the room
 - Exam was terminated immediately
- Review of Recording and Proctor decision
- Candidate was later allowed to sit for the exam at a test center

Technical Issues

76% did not have any issues

24% had the following issues:

Connectivity Issues (13%)
OS issues (6%)
Monitoring issues (4%)
System Error (1%)

99% completed the exam when scheduled

1% could not complete using RP

Accommodations

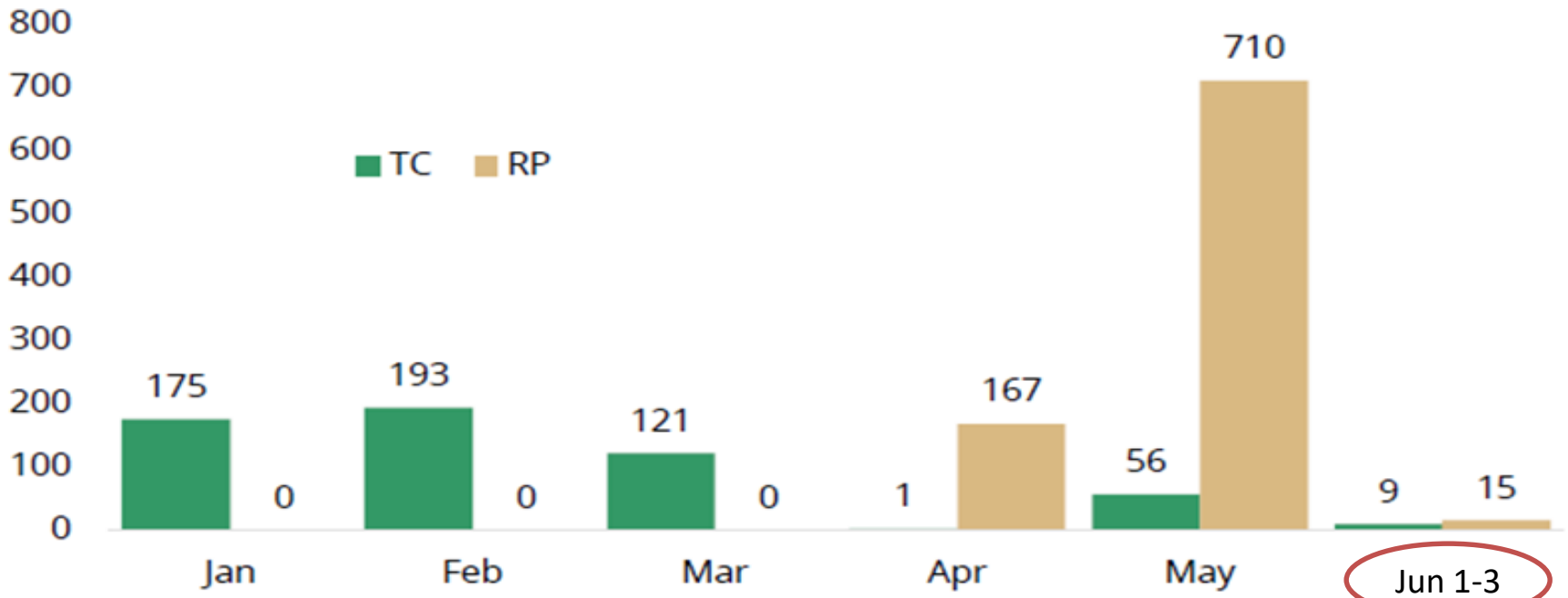
Most common request is more time, which was the case here too

No requests for private testing or quiet space

No readers requested but not allowed to read question out loud with RP anyway

Four requests received during trial all for extended time

Number of Administrations

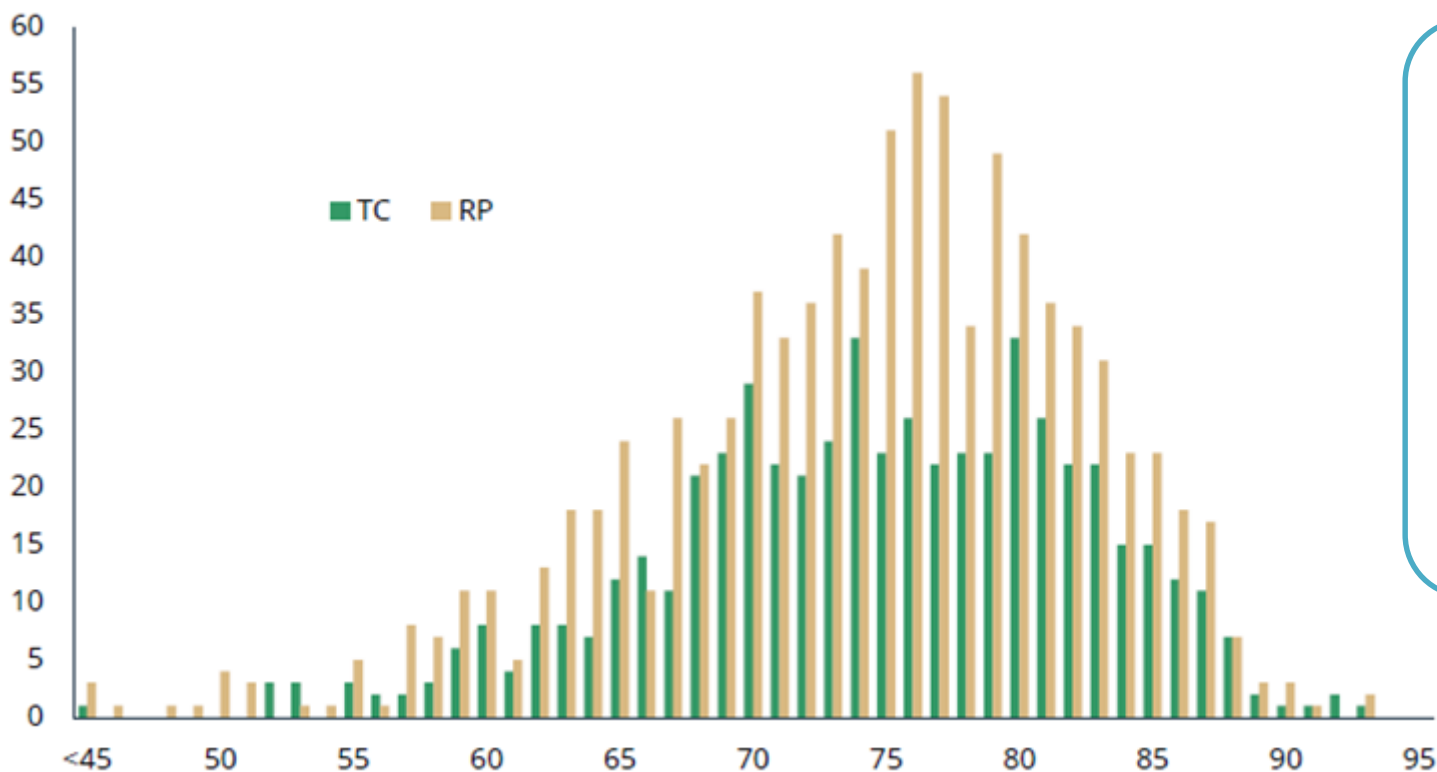


More examinees have tested since, but this was the collection of administrations studied and reported to the NCCA

Now that both modalities are more freely available, about one third choose RP

Scale-Level Statistics

MODE	<i>n</i>	<i>k</i>	CUT	MEAN	SD	KR20	DC	SEM	TIME	PASS
TC	555	100	67	74.52	7.95	0.76	0.88	3.87	85.0	84.86
RP	892	100	67	74.14	8.34	0.78	0.88	3.88	79.6	83.52



No Differential
Item Function
(DIF) Found

$\chi^2 = 0.000$, $p = 0.995$, $df = 1$

χ^2 for items was
0.000 or 0.001

Candidate Experience Survey

A Candidate Experience Survey
was administered to all examinees
who tested on April 1 and on

777 of 892 LRP examinees
completed the survey (87%)

65 of 66 TC examinees completed
the survey who took the test on
April 1 or later (99%)

Post-Test Survey Results

QUESTION	SCALE	TC	RP
Satisfaction with registration and scheduling process	Satisfied or very Satisfied	94%	93%
	Dissatisfied or Very Dissatisfied	6%	7%
Satisfaction with the date and time of the testing session	Satisfied or very Satisfied	94%	89%
	Dissatisfied or Very Dissatisfied	6%	11%
Satisfaction with the temperature, lighting, noise level, and seating	Satisfied or very Satisfied	95%	99%
	Dissatisfied or Very Dissatisfied	5%	1%
Satisfaction with the proctor's instructions and support	Satisfied or very Satisfied	100%	96%
	Dissatisfied or Very Dissatisfied	0%	4%
Satisfaction with screen size	Satisfied or very Satisfied	95%	98%
	Dissatisfied or Very Dissatisfied	5%	2%

93% who selected RP took the exam from home

Post-Test Survey Results

QUESTION	SCALE	TC	RP
Satisfaction with the ease of the Computer Testing System	Satisfied or very Satisfied	95%	82%
	Dissatisfied or Very Dissatisfied	5%	18%
Overall satisfaction level with the delivery modality you selected	Satisfied or very Satisfied	98%	84%
	Dissatisfied or Very Dissatisfied	2%	16%
Did you experience technical problems during your exam? (e.g., connectivity, accessibility)	YES	6%	44%
	NO	94%	56%
Would you choose this method of testing again?	YES	99%	87%
	NO	1%	13%

While RP candidates appear to be somewhat less satisfied overall (perhaps due to technical issues), almost all would select that modality again

Future Improvements

Gaze detection – ensures candidate remains in view and looking at the screen or camera

Facial Recognition – monitoring of candidate image from photo taken at start of exam

Audio Indicator – volume threshold

Auto detection of mobile devices in environment

Automated candidate motion alert

Improvements are Scheduled to Launch in December 2020

Conclusions

Comparability of Outcomes

Statistical analysis suggests that outcomes in either proctoring modality do not differ; and candidate satisfaction with process appears to be similar in most respects

Interpretability of Results

Candidates were free to choose either proctoring modality, but test center administration was not feasible for a portion of that time

Not Just the Flip of a Switch

As with any change in test administration, work is needed to update policies, procedures, and candidate communications

Thank You

Time for Questions

