Practical Polygraph: The Known-Solution Acquaintance Test and Functionality Check

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Abstract

We discuss the published literature on the effectiveness of the known-solution acquaintance test (ACQT). Although studies have not supported an effect for the unknown-solution ACQT, the known-solution ACQT is better supported by scientific evidence. Some important advantages of the known-solution ACQT is that it does not engage a role-reversal, wherein the examinee is testing the polygraph test, and does not rely on manipulation or deception as a form of demonstration of the validity of the polygraph testing. The basic procedures are described for using the known-solution ACQT.

Introduction

Use of an acquaintance test (ACQT) is a standard practice for polygraph diagnostic and screening exams (American Polygraph Association, 2018; Department of Defense, 2006), and serves as a form of *practice-test* for the examinee and as a *functionality-check*[1] for the examiner. Reid (1947) provided an early description of field practices that were in some ways like the contemporary ACQT, involving a *card-test* as a form of *control-test* to ascertain that the examinee can exhibit normal physiological responses to the test questions in the event of deception. In contemporary usage, the ACQT is conducted as the first test chart. However, early use of the *card-control* test was after the first iteration of the sequence of polygraph test questions and its purported purpose was to demonstrate the polygraph effectiveness to the examinee.

Discussion

Reid and Inbau (1966) described the card-control test wherein the examinee is instructed to pick a card under the false pretext that the examiner does not know which card was chosen. Although Summers (1939) first described the use of comparative response questions, Reid (1947) popularized the idea and suggested that the inclusion of control questions in polygraph test question sequencing represented an advancement in polygraph field practice methodology over the card-control test. Reid also suggested that the card-control test should be conducted as the first chart. Other publications, such as those by Kirby (1981), describe continued use of the standard-card-test, also known as a *card-stim* test, after the first iteration of the polygraph test questions. Later, Widup and Barland (1994) reported there was no effect for the classification of deception or truth-telling, and no effect for inconclusive results, when a *number-stim* test was used before or after the first iteration of the sequence of polygraph test questions.

Kirby (1981) studied results using the

1 Most modern computerized polygraphs do not require periodic field calibration or periodic factory service, though it may be important to check with the manufacturer of each individual instrument. The notion of *functionality check* refers to whether the recording sensors and software are capturing and recording physiological data in the intended ways. Proper functionality is easily observed at the time of an examination when observing and recording stimulus events and changes in sensor activity and can be effectively observed and demonstrated during the administration of an ACQT.

standard card-test and the *known-card-test,* finding no difference in effect sizes for deceptive or truthful outcomes. The known-card-test was also referred to as the *known-solution-test* – a form of *peak-of-tension* test. The known-solution-test differs from the earlier unknown card-test in important ways. The most important difference is that no attempt is made to conceal the examinee's selection when using the known-solution ACQT.

Kirby (1981) also provides insight into the use of the *card-stim* test, also referred to as a *stim-test* or *stimulation-test,* including the emphasis on promoting a perception of the infallibility of the polygraph instrument. The standard-card-test at that time was an *unknown-solution* ACQT for which each examinee was required to select the key question by selecting a number, card or item. The premise was that the examinee would conceal their choice of key question from the examiner. The examiner would then conduct the unknown-solution ACQT and correctly determine the examinee's choice and would then proceed to verbally stimulate the examinee while asserting the infallibility of the test.

This older practice of attempting to assert the infallibility of the polygraph appears to have been premised on an arcane assumption that the effectiveness, or validity, of the polygraph was fundamentally dependent on the examinee's belief that the polygraph was flawless. These assumptions may have contributed to the emergence of field practices wherein every examinee was informed, regardless of the outcome, that they had been correctly detected. Other field practices involved the manipulation of the purportedly unknown-key question such that the examiner either determined the examinee's selection or was fully informed and knowledgeable about the examinee's choice prior to the ACQT. Elliott, Egan & Grubin (2017) provide evidence that it is not necessary for the examinee to believe the complete infallibility of the polygraph for it to be effective.

Reliance on manipulation and deception in the demonstration of polygraph validity is scientifically questionable. Moreover, reliance on manipulation and deception in the ACQT has been described by psychologists as ethically questionable (see Lykken, 1981; Note 2 in Bradley & Janisse, 1981) and potentially problematic in that some examinees may learn of the use of misinformation and manipulation in the ACQT (Ben-Shakhar & Furedy, 1990; Lykken, 1981). One view of type of test represents a form of role-reversal – wherein the examinee is testing the examiner.

Perhaps the most problematic aspect of any attempt to use the ACQT to demonstrate the polygraph's effectiveness to the examinee, is that virtually no well-informed person today believes the polygraph, or any scientific test, to be infallible. Yet studies involving examinees who were knowledgeable or informed about polygraph methodologies (Honts & Reavy, 2009; Honts & Alloway, 2007; Honts & Handler, 2015; Nelson, Handler, Blalock & Hernandez, 2012; Rovner, 1986) have reported effect sizes for test accuracy that are similar to other studies with more naive examinees. This complication to the older intended usage of the ACQT – involving the demonstration or proof of the infallibility of the polygraph – is that highly motivated examinees may be likely to respond with superficial cooperation, and examiners may be at risk for mistaking this for authentic or genuine rapport (though most polygraph examiners would assuredly deny ever making such an error).

Studies on the ACQT and the use of feedback are informative but provide somewhat mixed information. Using a card-test, Ellson, Davis, Saltzman, and Burke (1952) showed that detection of deception was more difficult and reduced on subsequent trials when examinees were informed that deception had been detected in response to the first trial. Later, Davis (1961) hypothesized that guilty subjects might become less psychologically reactive, and therefore less detectable, if they are convinced that their deception is clearly indicated. It is also possible that guilty subjects alter their strategies for concealing their deception after receiving effective feedback.

A subsequent study by Barland and Raskin (1975), using a comparison question test format, showed that the manipulation of feedback, in terms of effective detection of deception, ineffective detection, and no feedback conditions produced an effect for examinee confidence in the polygraph test but failed to produce an effect for the classification

of deception or truth-telling. A later study by Horowitz, Kircher and Raskin (1986) who also showed lower rates of deception when examinees were told that their deception had been identified during a number card-test. These findings differ from those of later studies that showed either no effect or desirable effects from the ACQT using a known-solution approach.

An important difference between the unknown-solution ACQT and known-solution ACQT is that the use of feedback with the known-solution ACQT does not attempt to assert the infallibility of the polygraph test, but instead attempts to provide the examinee with feedback as to the effectiveness of the sensors at capturing and recording changes in physiology in response test stimuli. A study by Bradley and Janisse (1981) – in addition to using an electric shock paradigm that showed no effect for the type or intensity of consequences for failing a polygraph test – found high rates of accuracy for the card control test, leading them to suggest that providing the actual results of the card-control test would be an effective approach that is less scientifically and ethically and complicated.

Kircher, Packard, Bell and Bernhardt (2001) studied the effects on the subsequent outcomes of comparison question tests with probable and directed lie questions when subjects were first placed in effective-feedback, ineffective-feedback, and no-feedback conditions using a known-solution ACQT test. Effective feedback in this usage was limited to statements about the observance of a physiological response to the test stimuli. The test structure was a known-solution ACQT format that was previously described by Podlesny and Truslow (1993). However, whereas Podlesny and Truslow instructed the subjects to answer truthfully to all questions, Kircher *et. al.* (2001), instructed the subjects to answer *NO* to all questions including the selected number. Horneman and O'Gorman (1985) previously reported that denial of a selected card led to increased response and detection of the correct number-card compared to affirmative answers or non-answering. Kircher *et al.* reported significant effects for both effective-feedback and no-feedback and generalized the recommendation of Bradley and Janisse (1981) for the use of effective-feedback with the known-solution ACQT.

How to Conduct the ACQT

ACQT Question List

Use of the ACQT begins with the construction of the list of stimulus questions. A commonly used form of the known-solution ACQT involves the use of sequence of numbers. Table 1 shows an example list of questions for a known-solution number test, using the number 4 as the known-key question. The examinee will be instructed to answer *NO* to the known-key question, along with all other ACQT questions. The example in Table 1 includes three buffer questions before the known-key question and three buffer questions after the key-question. Also, the key-question should be clearly indicated in the question sequence.

Table 1. Question list for known-solution ACQT number test.

Question Tag	Type	Question	Answer
X		This practice test is about to begin. Please sit still. Look straight ahead. Listen carefully, and answer "no" to each question. No other talking, and do not move during this practice test.	-
1		Did you write the number 1?	No
2		Did you write the number 2?	No
3		Did you write the number 3?	No
4K		Did you write the number 4?	No
5		Did you write the number 5?	No
6		Did you write the number 6?	No
7		Did you write the number 7?	No
XX	End	This practice test is complete. Please remain still until I release the pressure in the cardio cuff.	-

Table 2 shows another common form of known-solution ACQT, using the examinee's surname as the known-key question. The ACQT surname has been described by field practitioners as a simple and easy known-solution ACQT format for which the salience of the personalized known-key question differs from the other questions. Other known-solutions may also exist, including variants that make use of personal or novel information. Because there is no 'scientific magic-sauce' in the ACQT topic itself, there is no reason to expect any difference in the contribution to polygraph outcomes for different variants of the known solution ACQT.

Table 2. Question list for known-solution surname ACQT.

Question Tag	Type	Question	Answer
X		This practice test is about to begin. Please sit still. Look straight ahead. Listen carefully, and answer "no" to each question. No other talking, and do not move during this practice test.	-
1		Is your surname Johnson?	No
2		Is your surname Jefferson?	No
3		Is your surname Wilson?	No
4K		Is your surname Nelson?	No
5		Is your surname Iverson?	No
6		Is your surname Stevenson?	No
7		Is your surname Mickelson?	No
XX	End	This practice test is complete. Please remain still until I release the pressure in the cardio cuff.	-

Although some examiners may prefer to use a shorter list of ACQT questions, with fewer buffer questions, the use of three buffer questions is recommended because it provides more opportunity for any instruction or admonition needed to improve the examinee's posture or cooperation prior to the presentation of the known-key question. Use of three buffer questions will often ensure that at least one question was presented without the need for in-test instruction prior to the known-key question.

Examiners who use less than three buffer questions before or after the known key question will have more limited insight as to how the examinee will cooperate and respond during testing. In the same way that shortening the question interval can reduce the length of the ACQT, use of fewer ACQT questions may incorrectly instruct the examinee as to the expected length or duration of the question sequence during the data-collection phase of the polygraph test.

Many examinees are unaccustomed to polygraph testing, and may produce what is termed artifacted, or unstable data at the onset of testing due to unsatisfactory posture, cooperation (i.e., excessive movement) or distraction. These examinees may benefit from additional in-test instruction. It is common for some examinees to move slightly upon the X announcement of test onset, and some examiners may instruct the examinee at that time.

Other examinees may move upon answering the first question. This is also an opportunity to provide instruction to improve the examinee's behavior and cooperation during test. Another possible problem is that some examinees may become distracted during the silent periods between questions. This is also an opportunity for an examiner to provide information that helps motivated and truthful examinees to cooperate successfully.

Use of three buffer questions prior to and after the known-key question will ensure that the ACQT is closer in length to the actual polygraph test question sequence and will better orient the examinee as to what to expect during testing. This provides an opportunity for examinees to practice sitting patiently throughout the testing process and provides an examiner with more opportunity to observe the examinee's posture and cooperation during silent periods in between the test stimuli. Use of fewer buffer questions provides less opportunity for practice and observation. There is little value in the use of short-cut procedures during the ACQT.

Introduction and Review of the ACQT Questions

Introduction of the ACQT questions begins when the examiner informs the examinee that a practice test will be completed, and then requests the examinee to write a number (i.e.*"4")* in large print in the middle of a large circle which the examiner has drawn on a sheet of blank paper. The examiner will use this activity to orient or sensitize the examinee's attention to the number they chose, in this example *4*, and this can sometimes be done by circling the number *4* several times, or by asking the examinee to print boldly or over-print the number one or more times. The examiner will then, in the presence of the examinee, write the numbers *1, 2* and *3* before the number *4*, and then proceed to write the numbers *5, 6* and *7* after the number *4*. The examiner should explain to the examinee that it is obvious that the examiner has written the numbers *1, 2*, and *3*, and the numbers *5, 6*, and *7*, while the examinee is the person who has written the number *4*.

When using the surname test, having the examinee spell the surname, letter by letter, is good practice, as it can help to avoid spelling and documentation errors and can also serve to orient or sensitize the examinee's attention to the known-key question. Other variations on the known-solution ACQT may employ other methods to orient and sensitize the examinee to the known-key question, including simple math questions. Some examiners may choose to display a paper with the list of question items in front of the examinee during the ACQT. Others may request the examinee to fold the paper and sit on it during the ACQT. These activities are non-critical and are intended only to contribute to the examinee's heightened attention and awareness of the ACQT questions.

The examiner will explain to the examinee that during the test, he/she will be asked if they wrote the number 1, 2 and 3 (i.e., *Did you write the number 1? Did you write the number 2? Did you write the number 3?*)[2]. The examiner should read each question to the examinee and allow the examinee to answer. The examinee will normally answer *NO* to each question, and the examiner will advise that these answers are known to be truthful because the examiner, not the examinee, has written those numbers. The examiner may explain further that these questions provide an opportunity for the examiner to observe normally expected physiological responses.

The examiner will then present the known-key question, (*Did you write the number 4?),* along with a clear instruction that the examinee is to answer NO to this question, in the same manner as he/she has answered *NO* to each of the previous questions. The examiner should emphasize that it is already known that the examinee did in fact write the number 4 and that the required *NO* answer is incorrect. The examiner will further advise that the purpose of this is simply to observe how the examinee responds physiologically[3]. Some examinees may inquire to clarify that they are being instructed to lie, and it is acceptable to refer to the *NO* answer as a lie if the examinee does so.

Some examinees will know answering *NO* is not actually lying when one is instructed to answer *NO*. It is simply an instruction – a procedure – but not a lie. To avoid potential complications, it may be useful for the examiner to avoid referring to the requested *NO* answer as a *lie* unless the examinee spontaneously refers to it as a lie. Examiners who maneuver the examinee into referring to the requested answer as a lie may be at risk for mistaking superficial cooperation for rapport.

Other examinees may attempt to object to the idea of telling any lies during any part of the polygraph process or at any other times – asserting this to be inconsistent with personal values or religious beliefs. In these cases, it is often best to simply advise the examinee that answering *NO* in this context is not a lie *per se* but is merely an instruction and a procedure, and that failure to follow the instructions and procedures may result in not passing the polygraph test.

The examiner will complete the review of the ACQT questions by reading each of remaining questions and allowing the examinee to answer. The examiner should advise the examinee once again that it is already known that these answers are truthful or correct because the examiner has written the numbers 5, 6 and 7. The examiner should then advise the examinee that the purpose of the practice test is to observe the response when the examinee answers *NO* to the questions about number 4.

Introduction of the ACQT with the surname or other topics is like the use of the ACQT with numbers. The examinee is instructed to answer known-key question incorrectly with a *NO* answer. Also, it may be necessary to alter the buffer questions to exclude the known-key item when using a variation to the number-test.

2 Another form of these question has also been used, in this manner: *"Regarding the number you wrote, was it the number 1? "Was it the number 2? "Was it the number 3?"* Although semantically identical this wording has less similarity with common language usage. A principle of polygraph questions formulation is to use of comfortable and common language whenever possible to avoid reactions that may result from novelty or confusion from uncommon language usage.

3 It is not advisable to state that the purpose of this exercise is to observe what it looks like or what the examinee's body does when lying – because this statement would be obviously factually incorrect. The basic physiological patterns – phasic change and return to tonicity – is similar for many types of responses. Also, the act of lying to a matter under investigation is thought to be a distinct phenomenon from answering NO incorrectly when instructed to do so. For these reasons, it is advisable to limit this statement to one that is simple and factually correct: the purpose of the activity is to observe the physiological response.

Best practice is for the examiner to refrain from taking any shortcuts in the documentation and preparation of the list of polygraph test questions. This means that examiners should always type or write each of the questions completely, without shorthand, using correct spelling, punctuation, and use of capitalization.

After introducing and ascertaining the examinee's answer to the first three surname buffer questions, the examiner should alert the examinee that the next question will be the correct surname question but that it is a requirement to answer *NO*. The examiner should then ascertain through practice that the examinee can answer *NO* to the known-key question. The examiner can then introduce and ascertain the examinee's answer to the remaining buffer questions. The examiner should then advise the examinee that the purpose of the practice test is to observe the response when the examinee answers *NO* to the questions about his or her surname.

ACQT Question Interval

It is recommended that the ACQT is conducted with the same 25 second question pace interval as the data-collection phase of the polygraph test. While it may be tempting for some field practitioners to shorten the question interval for the ACQT – with the view that it is un-important or less important – use of a shorter interval may be problematic for several reasons. For example, use of a shorter question interval during the ACQT may deprive the examiner of an opportunity to fully observe the examinee's normal posture and cooperation after each test question and before the next stimulus is presented. Also, shorter question intervals may provide insufficient time for the physiological data to return to the tonic level before each subsequent test stimuli. A shortened question interval may lead some examinees to expect a similarly short interval during the polygraph data collection phase, leading to unintended cognitive activity or other reactions for examinees who notice what appears to them be an unusually long wait – though it is the normal intended interval – in between questions during the actual polygraph test.

Attachment of Polygraph Recording Sensors

The polygraph recording sensors should be attached to the examinee following the review of the ACQT questions. The examiner should briefly remind the examinee about the purpose or function of each sensor, in addition to advising the examinee about the importance of remaining still during testing. Many polygraph examinees will have an under-developed understanding of how to sit still during testing. It may be helpful for the examiner to clearly advise the examinee about how to remain still including the importance of keeping one's feet flat on the floor, allowing the chair to support one's posture, and keeping one's arms on the arm-rest or desk – in addition to the importance of looking straight ahead during testing. The examiner should take notice of those examinees who may benefit from an additional support to stabilize their feet during testing. Also, it is ideal if the examinee can use the back of the chair to further support and stabilize his or her head and posture during testing.

Examinee's should be advised to keep their eyes open during testing. This will help the examinee to avoid falling asleep during testing and may also help to avoid problems from increased attention to other physical sensations when one's eyes are closed, or problems related to past issues of trauma for some examinees. Using a visual focal point or visual reference point may help some examinees to refrain from looking around or moving their head during testing.

Although it does not affect the scientific validity of a test result, polygraph recording sensors are normally attached in a consistent sequence, beginning with the lower and upper respiration sensors. The traditional procedure is for the examiner to provide simple instruction to reposition the examinee while attaching the respiration sensors. Some examinees may experience less social discomfort if they are instructed as how to attach the sensors to themselves. The cardio cuff is normally attached to the examinee after the respiration sensors.

There is no empirical evidence to support a requirement that the cardio sensor or

other sensors must be attached to the right or left side of the examinee's body. Subsequently, there is no evidence regarding the direction of the cardio tubing. What is most important is that the cardio sensor and tubing must be located in a manner in which it will neither be disturbed by nor distract the examinee during the testing process. Electrodermal sensors can be attached to the examinee's right or left side as is most convenient for the testing location. There is no scientific evidence to suggest that the choice of right or left side has any effect on polygraph outcomes. Similarly, a fingertip vasomotor sensor can be attached to either the right or left hand. There is no basis of evidence to support requirements for the separation of recording sensors to different sides. Rules or constraints on these matters would increase examiner venerability to criticism with no known effect on scientific validity of the test data and test result. Most importantly, highly skilled examiners will be able to attach the polygraph sensors without placing the examinees in socially awkward and/or physically uncomfortable positions.

ACQT Recording

After all recording sensors are attached, the examiner will make any necessary adjustments and then initiate the ACQT recording. The examiner should inform the examinee that the recording has begun and will begin to advise the examinee of the need to sit still. Some examiners will inflate and stabilize the cardio cuff sensor prior to initiating the recording. This will generally result in less visual distortion at the onset of recording. Other examiners may prefer to start the recording before inflating the cardio cuff. Here the advantage is that the process of inflating and stabilizing the cardio cuff is permanently included in the recorded data and subsequently available for visual review.

Additional adjustments may be made to the data following the onset of recording. The ACQT itself begins with the announcement of test onset (X) and will proceed through the ACQT question sequence until the announcement of test completion (XX). The recording is stopped following the completion of the ACQT data collection, after which the data can be dressed or adjusted for optimal visual display and then saved to the computer storage device.

If any of the recording sensors are not functioning normally, or if the examiner is unable to stabilize the data to a satisfactory and usable degree, the examiner should terminate the recording and then correct the problem. After the problems are corrected, the recording can be started again and the ACQT completed. If an examinee's physiological data is observed to be of insufficient quality or stability, an examiner may elect to forgo polygraph testing or may wish to consult with the referring agent before deciding how to proceed.

Examinees who move excessively or who experience distraction during the ACQT can be given simple instructions. For example: "it is important that you stay still during the test," or "it is important that you concentrate and do not get distracted during the test." Similarly, problems involving disruptive deep breathing can be calmly addressed by advising "it is important that you do not move your upper body during this practice test." Instructions of this type should not be repeated more than two times.

Effective in-test instruction and skillful management of observed problems during the ACQT procedure may give the examiner an opportunity to observe whether the examinee is capable of and willing to cooperate during testing. An examiner may choose to abort and restart the ACQT if it necessary to provide an examinee with additional information or instruction in response to observed problems with attention, posture or cooperation. It may also be acceptable for an examiner to continue the ACQT to completion even after continued problems are observed after advising the examinee. Under some conditions an examiner may elect to repeat the ACQT.

If necessary, the ACQT may be aborted to address and correct any observed problems with the functioning of the recording sensors. It is unproductive to complete the ACQT if the sensors are not functioning as intended. The ACQT should be restarted after the problem is corrected. Correct functionality will be observed in the form of normal physiological activity in respiration, cardio, electrodermal,

vasomotor and activity sensors, along with observable changes in activity in response to the ACQT stimuli.

Known-Key Question

The known-solution ACQT is not dependent on psychological or situational manipulation, and for this reason can be viewed as less ethically and scientifically controversial. The known-solution ACQT permits more potential for standardization than the unknown-solution test, including the potential for the use of the same known-key question, located in the same position in the ACQT question sequence, for each examinee. Examiners who are tempted to add variation to the known-key item or ACQT question sequence are cautioned against adding variation only to relieve occasional professional boredom and are advised to embrace the value of a consistency in the applied use of the ACQT.

Consistency in the administration of the ACQT will help to avoid errors. Consistent administration of the ACQT will allow an examiner to gain more insight about individual differences in behavior and response at recording onset, attention during silent periods, response to in-test instructions, and response to test stimuli both before and following the known-key question. Although this information is unquantified and not subject to objective analysis, it is a potentially rich source of information that can assist an examiner to work effectively with each individual examinee.

Some examinees may answer incorrectly in response to the known-key question. If the examinee does not answer the known-key question as instructed, the examiner may terminate the ACQT and advise the examinee of the error and need to answer as instructed. It is possible that the examinee forgot instructions, though it is also possible that some examinees may choose not to cooperate. In either case the examiner may be able to rectify the problem by re-instructing the examinee and re-starting the ACQT. Some examiners may elect to provide the examinee with in-test instruction regarding the requested answer and then repeat the known-key question, either before presenting the remaining buffer questions of before the XX announcement of test completion. Because this is simply an acquaintance test, there is no known reason why this should be considered unacceptable.

The known-key question will normally produce an observable change in physiological activity. If no response is observed, the examiner may elect to repeat the known-key question at the end of the ACQT sequence, before the announcement of test completion. Though repetition is usually un-necessary, it may be useful to repeat the ACQT under some circumstances, such as when the examinee does not cooperate in a satisfactory manner or when the data are unsatisfactory and can be improved with some adjustment to the sensor or instrument. Some examinee's physiological responses may be unusable or un-interpretable. In these cases, a decision to proceed with testing under the prior knowledge that the data are unusable or uninterpretable would not be without some ethical complication.

ACQT Feedback

Common practice is to provide the examinee with feedback after the completion of the ACQT. Use of the known-solution ACQT – which cannot be confused with any form of parlor-trick – permits a standardized approach to ACQT feedback. It is reasonable to inform the examinee that he or she has shown a response to the known-key question. It is also reasonable to advise the examinee that he or she is likely to show a reaction in response to deception during the actual polygraph test, and similarly reasonable to advise that there should be no difficulty if he or she is telling the truth about the matter under investigation. An example is shown below:

> *You showed a reaction to that question about (the number 4 / your name / other ACQT topic). If you lie during the polygraph you are likely to show a reaction. On the other hand, there should be no great difficulty determining if you are telling the truth.*

These statements make no claims about the detection of deception or the magnitude of physiological response. And, empirical data supports these statements for normal functioning examinees. Detection of deception may not be a realistic endeavor with a single iteration of a question sequence, and the use of a known-solution ACQT creates a context in which no actual deception has occurred.

The purpose of the known-solution ACQT is to allow the examinee to become accustomed to the sensors, testing procedure, need for cooperation, and for the examiner to ascertain that the instrument and sensors are functioning as intended. For this reason, it is neither necessary nor advisable to tell the examinee that any deception has been detected. Nor it is advisable to tell the examinee anything about the difference or size of the observed reactions.

It is not advisable to show the ACQT charts to the examinee, because providing this information may contribute to a change or increase in the way the examinee attends to his or her perceptions and awareness of physiological activity and responses during testing. Examinees who desire to engage in countermeasures during testing may attempt to misuse the information gained if an examiner shows the test data. This view contrasts with older practices that sometimes involved showing the ACQT data to the examinee[4].

Summary

The ACQT has been used by polygraph examiners since the early history of the polygraph profession, though its use has changed somewhat over the years. Along with subtle but important changes in ACQT field practices, some changes have occurred in the terminology used to refer to the ACQT. For example, some early practices involved the use of the ACQT between the first and second test chart and referred to the ACQT as a *stim test* or *stimulation test*. The term *stimulation* may have been thought by some to be problematic, and the profession has gravitated away from that term in the form of more comfortable and general words like *acquaintance test* or simply *practice test*. The method described herein is highly standardized, and applicable to a wide range of examinees and testing contexts. It does not depend on parlor-tricks, manipulation or misinformation, and is consistent with published scientific evidence on the beneficial effects of the ACQT on polygraph outcomes.

The known solution ACQT is the only form of acquaintance test described in available publications on polygraph field standards of the U.S. federal government (Department of Defense, 2006). Considering the available scientific evidence for the known solution ACQT there is little argument that it is a valuable part of the test, and little argument for the use of any unstudied or experimental form of ACQT in lieu of the evidence-based known-solution test. It is consistent with published evidence and applicable to a wide variety of polygraph screening and diagnostic contexts, including criminal investigations, public safety applicant screening, employee screening, security screening, and post-conviction testing. The known-solution ACQT is highly standardized and does not rely on psychological or situational manipulation, or misinformation.

There is much to learn about an examinee from the careful and competent use of a known-solution ACQT. In addition to ensuring that the instrument and recording sensors are functioning as intended, it is an opportunity to observe the examinee's posture and cooperation during testing, and potentially rectify any problems before the actual polygraph examination. Skillful use of the known-solution ACQT has been shown to increase the effectiveness of the polygraph test. The actual reason for this effect appears to have little to do proving or demonstrating the effectiveness or infallibility of the polygraph test and may have

4 The most concerning of all old-school manipulative ACQT practices that the authors are aware of involves the increase of test sensitivity adjustment at the time of the key-question, resulting in a response that would always be visually impressive though unrepresentative of the actual change in physiological activity. This practice is not possible with contemporary computerized polygraph instruments.

more to do with ensuring that the instrument and recording sensors are functioning properly and that the examinee has had an opportunity to practice cooperating with behavioral instructions during the polygraph test.

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