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The Event Knowledge Test (EKT)

In Lithuania polygraphs have been in use since 1992. Tests that are based on a comparison-relevant question system are not popular. The results of psychophysiological tests and their conclusions are difficult to prove in courts. The results of tests have almost no use to the police and prosecutor's department in pre-trial investigation. Those results in criminal investigations that were evaluated highest in court decisions were achieved using an event knowledge test (EKT).

The peak of tension test (POT) was developed by Leonarde Keeler (1994). He developed the foundations of the guilty knowledge test (GKT). Keeler's test contained the following:

1. Within the last two days did you steal a car?
2. Within the last two days did you steal a bicycle?

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3. Within the last two days did you hold someone up?
4. Within the last two days did you burgle a house?
5. Within the last two days did you try to spend a bad cheque?
6. Within the last two days did you rob a bank?

According to S. Abrams (1989) two types of POT procedures exist – a known solution peak and a searching peak. In the former, both the perpetrator and the examiner know the critical crime issues, while in the searching peak, only the person with guilty knowledge is aware of them. David T. Lykken (1981) conducted extensive research and popularized the guilty knowledge test among scientists. Gershon Ben-Shakhar (2002) contributed significantly to a more extensive application of GKT. This method is widely used in Japan (Nakayama 2002). Japanese police polygraph examiners call GKT a ‘concealed information test’ (CIT). Polish polygraph examiner A. Krzyscin (2001) proposed the term ‘multiple-choice test’. According to Matte (1997), the North American version of the GKT often includes a second key question that serves as a kind of control question as a ‘true key’ in the form of a ‘false key’ to protect innocent subjects. On the whole polygraph specialists from North America use GKT quite seldom. For instance, up to 1994 FBI examiners used GKT for up to 18% (Podlesny 1994) of all the examinations conducted. In Russia the V. Varlamov (2000, 2001) school of polygraph examiners is dominant. In this school GKT is considered the main polygraph test. Varlamov says that during a polygraph examination one should not increase the stress of the examined subject and questions should be indirect. In a murder case the test would look like this:

In your opinion, how many people fired at subject A?

0. six
1. five
2. three
3. one
4. four
5. two (a relevant question)
6. seven

In Varlamov’s test the first question is what the author calls “offered”, indicated by number ‘0’, and goes first. He also emphasizes the requirement to formulate the question in indirect form. P. Ekman (1992) formulated five

reasons that would cause significant stress to the suspect just because the police have arrested him/her. A strict direct question might provoke even greater stress to the examined person.

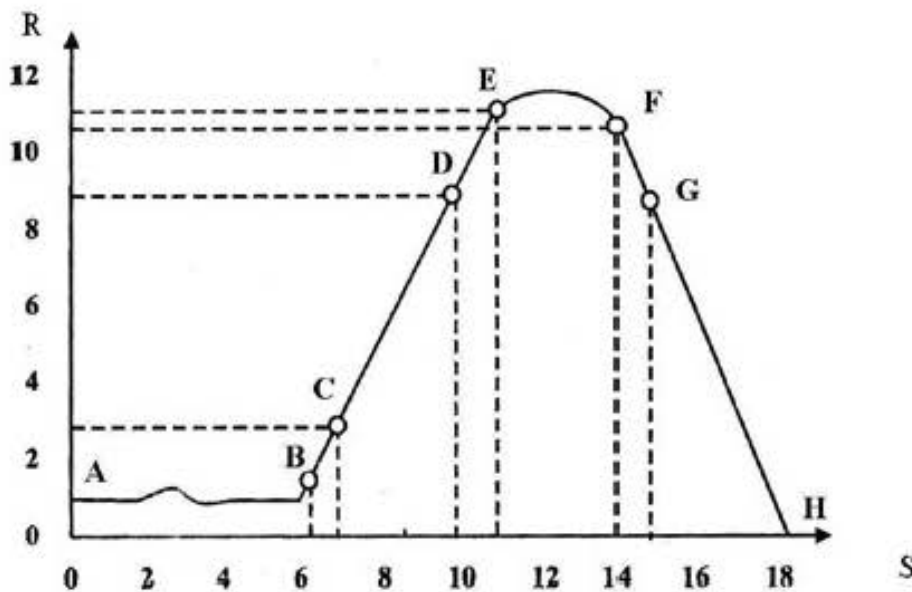


Figure 1

Dependence of human functional possibilities or psychophysiological reactions R of the body on emotional stress S . According to Varlamov (2000).

Figure 1 demonstrates the possible dependency of human reactions on stress. Varlamov recommends examining a person when his/her stressful state is between the interval B and D. Within this interval human psychophysiological reactions may have an almost linear dependence on increase of emotional stress, i.e. when the stress increases, the volume of psychophysiological reaction increases accordingly. If the results of a polygraph-examined person are within the interval EH due to significant stress, reactions measured with the help of a polygraph may be wrongly interpreted by an examiner (an examiner may fail to measure variation of the psychophysiological reaction). This means that if the functional possibilities of a person arrested by the police are within the interval of the curve DE, human functional possibilities that were caused by stress due to a direct question will appear in the EH part of the curve, and it will not be possible to use the measured psychophysiological reactions for evaluation of the effect of a question. An experienced examiner can spot from the behaviour of the examined person that he/she is undergoing stress, but cannot determine

exactly in what part of the curve his/her functional possibilities are. Recently several computerized polygraphs have been developed which have an additional emotional stress assessment scale (the DIANA polygraph). Recently in criminal and official (the latter are examinations conducted inside special services) examinations EKT has been used as a polygraph in Lithuania. The essence of this test is based on GKT. During the test what the suspect knows about the event is also checked, and at the same time police investigators try to find details of the criminal act which are later investigated using other police methods. The majority of people examined by polygraph are witnesses to the crime or innocent people. This is due to two reasons. First, in each criminal or official examination there are a few times more suspects than people who commit a crime. Second, as suspects have a right to refuse a polygraph examination, some perpetrators use this right. If the polygraph examiner determines that the suspect could not have committed a crime, this is a very positive thing to the criminal investigation and the public. The names of the tests itself – guilty knowledge and concealed information – are in their essence of an accusatory nature. Justice calls not just for finding the perpetrator, but also for acquitting any person who has been unsatisfactorily accused. It is not the examiner who judges whether the subject is guilty or not guilty of the committed crime according to the test results. The court makes a final decision based on a set of evidence. Therefore, one of the reasons for emphasizing that the test is objective to all participants of the criminal act is called an events knowledge test (EKT). EKT is also different from GKT in formulation of questions and answers. EKT questions are formed in accordance with the material available on a criminal act and its prepared versions. Some questions include the facts that are already known to the police (e.g. nature of murder, instrument of murder, place of murder, etc.) and the facts the police are not yet aware of (e.g. time of murder, number of perpetrators, means of transport by which the perpetrators got to the place of a crime). Each question is followed by 6–12 ready possible answers (in GKT they are called questions). 5–14 questions with answers are prepared. The first answer, numbered 0, is considered as offered and is not included in the assessment of the reactions. For instance:

Are you aware of what car the perpetrators used for getting to the bank?

0. NIVA
1. FORD
2. OPEL
3. TOYOTA
4. MAZDA
5. NISSAN

The examined or critical circumstances of the crime may be in any answer except '0'. On making questions and answers possible, the psychophysiological reactions of the examinee to the given answers are anticipated. Therefore, additional questions with answers are also prepared, which may be included or rejected by an examiner during a polygraph examination. We can discuss this in detail in our next article. We would also like to point out that the answers are very short. We try to make them from one or two words. When the answers are very short, there is no need to introduce them to the examinee before the test because he/she immediately understands them. Of course, words for the answers are chosen according to the education of the examinee and the vocabulary he/she uses. Short answers help to avoid occurrence of artefacts. There is a higher probability that the psychophysiological reactions of the examinee would begin not in the middle but at the end of the sentence, or after the answer yes-no. Whereas the examinee does not know the answers until a polygraph examination, it is more difficult for him/her to prepare tactics for contra actions. In our practice we had some cases when the suspect, trying to hide circumstances after critical answers, gave the answers "no" apparently faster. We do not conduct pre-test interviews. Prior to the test the examinee is given a short description of how a polygraph operates. The examiner finds out whether the examined person is rested, has any serious health issues or has used some medicine on the day of examination. The examinee has his/her rights explained and signs consent to a polygraph examination. When the polygraph sensors are already connected, the examiner reads out the first question to the examinee, asks if he/she understands the question and whether he/she knows the answer to it. Sometimes the examinee gives a critical answer. Then the examiner does not record psychophysiological reactions to the answers of this question and transfers the version given by the examinee to police investigators for verification. If the questions are well prepared, such cases almost never happen. Most often the examinee says that he/she does not know the answer. Then the examiner explains that he/she will read several versions of answers and he/she will answer to each question "no" because he/she is not aware of the crime circumstances. Sometimes after recording psychophysiological reactions of all the answers to one of the questions, the examinee wants to explain his/her feelings or his/her state to a certain answer. The examiner listens and corrects his/her explanation, if necessary. The same procedure is applied to all other questions. If no significant psychophysiological reaction to the critical answers is registered the examiner makes a conclusion where he/she states that during the examination it has not been determined whether the examinee knows the circumstances of the committed crime. When a polygraph registers reactions

to critical questions and some search answers during the examination, the examiner shall name them in the examination conclusion. Sometimes psychophysiological reactions to neither question are registered. This can happen for two reasons: first, the examinee does not remember or has not taken note of the circumstances of the crime, and second, there is no critical answer among the answers because of the examiner's fault. Later, police investigators compare the data obtained from a polygraph examination with the available facts about the crime and conduct additional search or examinations if necessary. Varlamov (2000) and Krzyscin (2001) wrote that if they succeed in formation of several questions about a criminal act, this test has very high accuracy. We can check the theoretical reliability of the results according to the following formula:

$$P = 1 - \left(1 - \frac{1}{n_1 n_2 \dots n_i} \right),$$

where P – theoretical probability that the psychophysiological reactions of the examinee have not been random n_1 – number of answers to the first question (offered answer not included) n_2 – number of answers to the second question, n_i – number of answers to the last n-teen question.

The theoretical probability that psychophysiological reactions of a polygraph examinee have not been random depends on the number of questions as demonstrated in Table 1 and Figure 2. Table 1 and Figure 2 show calculations according to the provided formula, when the number of answers to each question is 5 (the minimal number). In case the number of answers is higher, accordingly the theoretical probability P will be higher, too. Calculations here are limited to five questions.

Table 1. Dependency of theoretical probability on number of questions

n_1	n_2	n_3	n_4	n_5	P
5	0	0	0	0	0.8
5	5	0	0	0	0.96

5	5	5	0	0	0.992
5	5	5	5	0	0.9984
5	5	5	5	5	0.99968

P

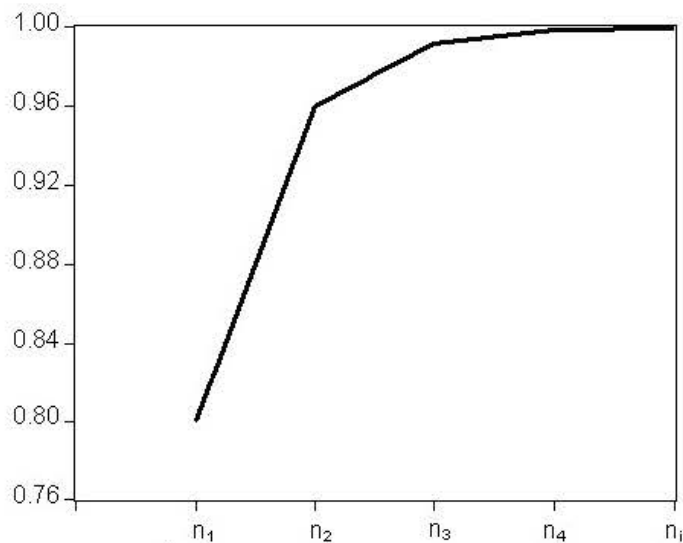


Figure 2.

Dependency of theoretical probability on number of questions

In Table 1 and Figure 2 we can see that when we get psychophysiological reactions to at least four critical questions, the theoretical probability that the latter reactions are not random is 0.9984, or 99.84 %. On choosing more questions, the probability is almost 1, or 100 %.

Summarizing what has been already described, we can distinguish the following features of EKT:

- a test of indirect questions
- questions are formulated in a non-incriminating form
- alternatives are given in the form of answers
- the questions provided may be long and with explanations

- the examined person is not familiar with the answers before the examination
- information search is conducted together with verification of information about the incident
- the examined person has difficulty in choosing tactics for contra actions.

In their further articles the authors hope to share practical experience in the application of EKT for criminal investigations.

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