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Joseph W. Harney

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THE ANALYSES OF RESPIRATORY CRITERIA IN DECEPTION TESTS A Possible Source of Misinterpretation*

Joseph W. Harney†

In attempting to objectify and standardize the criteria for the recognition of deception in graphic recordings taken from criminal suspects, the investigator is faced by two major problems: (1) to determine which types of responses in these records are most characteristically associated with deception, thus classifying them as probable symptoms of deception; and (2) a further study of the occurrence of such symptoms of deception in order to determine whether they may at times also be associated with non-deceptive types of behavior which might thus lead to confusion or misinterpretation on the part of the deception test examiner.

The first problem has been very adequately taken care of by Trovillo in a recent monograph.¹ In this monograph Trovillo classified among other things certain symptomatic patterns of respiratory changes characteristic of deception in actual laboratory investigation of suspects in actual crimes. The present writer, on the basis of his own experience as a deception test examiner as successor to Mr. Trovillo at the Chicago Police Scientific Crime Detection Laboratory, as well as from acquaintance with the literature in this field, knows of no recent contribution equal to Trovillo's cataloging and classification of the deception test criteria.

The success of this empirical classification has suggested as an extension of Trovillo's work an inquiry into the nature of some of the deception test responses. The scientific approach of Trovillo to the problem is evident in Section 2 of his monograph in which he discussed ambiguities in the records and indicates that more work must be done if deception tests are to be removed from the purely empirical and intuitive interpretation stage. If we can now answer the second problem above by proposing certain control tests employing respiratory recordings, and if in these control tests the respiratory response brought about by non-deceptive situations appears to be similar to the respiratory responses symptomatic of deception, we should have a further refinement of the work of Trovillo in the cataloging of deception test criteria.

In a study of the internal and external stimuli which may accompany a decision involving the choice between several possible solu-

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† Forensic Psychologist, Chicago Police Scientific Crime Detection Laboratory.

¹ Paul V. Trovillo, "Deception Test Criteria," *Jr. of Crim. Law and Criminol. (Pol. Sci. Sect.)*, 33 (4): 338-358 (Nov.-Dec., 1942).

tions to a relatively simple problem, namely the selection of a three-lined geometrical figure, Smith and Guthrie² reported certain characteristic changes in the pneumograph recordings of breathing which closely resemble respiratory criteria cited by Trovillo for deception in actual criminal investigations.

The present investigation has been designed to verify the fact that non-deceptive situations such as those designed by Smith and Guthrie may bring about respiratory changes very similar to those which are associated with deception and, further, to suggest a type of check procedure which will test for the presence of a non-deceptive factor in those cases where the total pattern of evidence is not clear cut. All of the records considered by Trovillo in his monograph were secured from subjects examined by him at the Chicago Police Scientific Crime Detection Laboratory. The examinations were conducted in a semi-soundproof room which was quiet and private so that any extraneous disturbance stimuli could be controlled or eliminated. The usual deception test secures three or more types of recordings; namely, the blood pressure, electrodermal, and the respiration. In this present study, however, we are only concerned with the respiratory responses. The recordings discussed by Trovillo were made on a Keeler Polygraph.³ A Sumner⁴ pneumograph was used to secure all of the respiratory recordings. It is apparent that Trovillo's monograph definitely does not represent the ideas of an armchair criminal investigator but are actual scientific records secured in successful criminal investigations. The experimental test situation employed the same room for its test administration, the same instrumentation (with the exception previously noted that only respiratory responses would be considered), and the test administration was by the deception test examiner who succeeded Mr. Trovillo at the Chicago Police Scientific Crime Detection Laboratory. Since the usual testing procedure of actual criminal investigations was followed the findings should be relevant to that situation.

² Stevenson Smith and Edwin R. Guthrie, *General Psychology in Terms of Behavior*, (New York: D. Appleton-Century Company, 1921). 205-209.

³ The recordings discussed and considered by Trovillo as well as the present writer were made on a polygraph in use several years at the Chicago Police Scientific Crime Detection Laboratory and used in the Laboratory when it was affiliated with Northwestern University. It is one of the earlier instruments devised by Leonarde Keeler, and employs metal tambours, pen and ink recording, and mechanical amplification of pneumatic changes occurring in the blood-pressure cuff and the pneumograph tube. Electrodermal recordings were made on a separate instrument, a recording psychogalvanometer developed by C. M. Wilson, Director of the Chicago Police Scientific Crime Detection Laboratory. The blood-pressure, pulse, and respiration graph are fair approximations of the recordings obtainable from any Keeler polygraph, new or old, as well as from the Berkeley Psychograph, or other ink-recording polygraphs.

⁴ John Frederick Dashiell, *Fundamentals of General Psychology*, (Boston, Mass.: Houghton Mifflin Company, 1937). 182-183.

In Trovillo's monograph under the heading "Indices of Deception," page 345, discussing respiratory changes, he states:

"Respiratory changes referred to are those effects known simply as (1) suppression, or comparatively shallow breathing, (2) respiratory block, or inhibition, in which breathing is discontinued for several seconds—an exaggerated form of suppression, and (3) altered pattern of the breathing. The records may also reveal an apparent respiratory tremor (see Ambiguities Section, respiration record number 8) occasioned by the pneumograph tube picking up especially violent heart action. Of the three criteria just mentioned, the first two seem of the greater importance and the first one especially is the reaction most commonly observed."

The respiratory responses or criteria are further classified and listed (page 348-349) as follows: (1) Suppression at point of deception, (2) Respiratory "Block," (3) Rise in base line of recorded respiration (a form of suppression), (4) Respiratory suppression preceding deception stimulus, followed by deeper respiration at point of deception, (5) Regularity of respiration up to and through the deception stimulus, and (6) Respiratory irregularities up to point of deception, followed by regular respiration. These then are the standards of comparison, the criteria with which the respiratory responses of the experiment test found in the records of subjects administered a non-deception test are to be compared.

The problem task set by Smith and Guthrie would seem to be appropriate for the purposes of the present study for the following reasons: (1) no deception could be present in the test situation either intrinsically or extrinsically; (2) the emotional tone or loading is very slight if existent at all, (3) simplicity of the experiment test; (4) brevity of test; and (5) the test can be administered using the same instrumentation and setting as that used in the administration of deception tests.

In recapitulation then we may say that we are comparing the types of respiration responses found in known cases of deception with the respiratory responses of subjects administered the more neutral problem task test set by Smith and Guthrie.

We may say then that the object of the present experiment has been to verify the fact that non-deceptive situations described by Smith and Guthrie may bring about respiratory response changes very similar to those which have been classified by Trovillo and others as being associated with deception and, further, as an outgrowth of this verification to suggest a type of check procedure which deception test examiners might find useful in their appraisal and interpretation of deception test results.

Fifty-four non-criminal adult males were thus given the simple problem task set by Smith and Guthrie according to the procedure which follows.

The subject was seated in the examining chair of the Laboratory's Polygraph Room. The pneumograph (Sumner) was attached and adjusted until suitable recordings were secured. When a satisfactory recording was secured, a control respiratory recording was then made. At the conclusion of the control, three small strips of cardboard were placed before the subject and the following instructions were then read to each one participating in the experiment test:

"Wait until you feel that you wish to do so then place these strips of cardboard so that they form some geometrical figure."

After the instructions were read the subject was asked if he understood them. If he indicated that he did not they were repeated or explained until the experimenter was sure that the instructions were clearly understood. The polygraph was turned on, a mark being made at that point at which the experimenter had indicated to the subject that he was to begin the task. Another mark was made on the recording paper at the point at which the subject made the first observable overt response of reaching for the strips or pieces of cardboard. The instrument was then run for a short control interval after which it was stopped.

Approximately 65 percent of the recordings could be classified into two general groups as exemplified in Figure 1 and Figure 2. Another 15 percent could be classified as seen in Figure 3. The remaining portion of the records could not be classified into any common group and were not considered further in the present study.

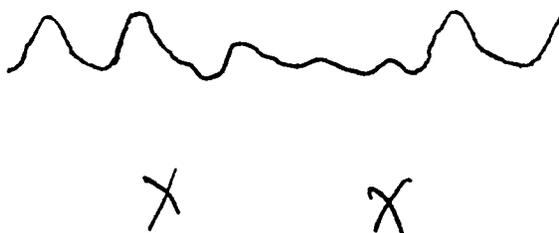


Figure 1

Blocking of the respiratory response (apnoea) at the point of presentation of a non-deception problem task (Smith-Guthrie) to the subject. (The point of stimulus presentation is noted or indicated by the initial or first "X" mark on the recording.) This respiratory blocking continues until the first overt response movement of the subject takes place (indicative of the apparent resolution of the problem task by the subject, noted or indicated by the second "X" mark on the recording). A relief breath and a return to the normal respiratory response pattern takes place after the overt response movement. The *pseudo deception pattern* is the area between the two "X's."

Compare this Figure with Figure 4 of Trovillo, "Respiratory Block." Trovillo considers and catalogs this type of respiratory response as one of the characteristic criteria and indices of respiratory deception response patterns.

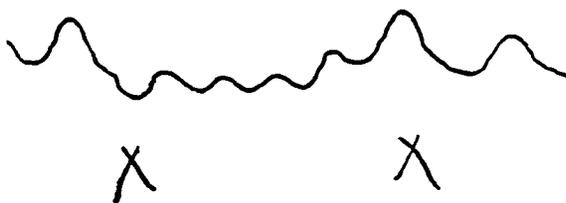


Figure 2

Suppressed respiration or suppression (decreased amplitude and rate of respiratory response) during the period between the presentation of the non-deception problem task stimulus and the first overt response. Compare this Figure with Figure 5 of Trovillo, "Suppression at Point of Deception."

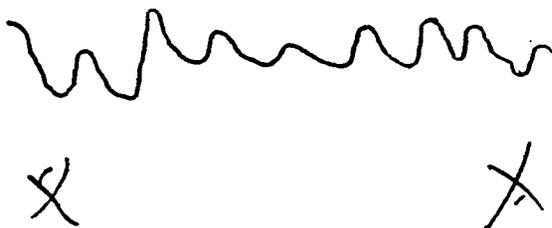


Figure 3

The base line of the respiratory response of this record has left its initial position and risen upwards. This rise in the respiratory base line is considered by some to be a form of suppression. Compare this Figure with Figure 6 of Trovillo, "Rise in the Base Line of Recorded Respiration" (a form of suppression).

The above three types of responses on the basis of a careful comparison with actual respiratory deception responses as defined and classified by Trovillo in "Detection of Deception" (pages 348-349) were found to most closely resemble his types—1. Suppression at Point of Deception; 2. Respiratory "Block"; and 3. Rise in Base Line of Recorded Respiration, which are illustrated in Figures 4, 5 and 6.⁵

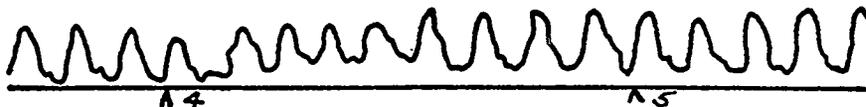


Figure 4

SUPPRESSION AT POINT OF DECEPTION

⁵ The three illustrations (Figures 4, 5, and 6) are reproduced here with the special permission of Paul V. Trovillo and appeared in his article "Deception Test Criteria." (See Note 1.)



Figure 5

RESPIRATORY "BLOCK"

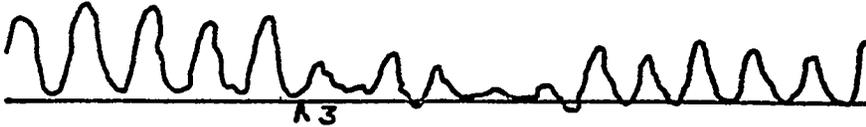


Figure 6

RISE IN BASE LINE OF RECORDED RESPIRATION

The evident similarity of the respiratory responses secured in non-deceptive test situations to those secured in actual deception test situations thus verifies the findings in the literature that *apparent pseudo-deception respiratory responses* may be produced by non-deception test situations. It is, therefore, suggested that deception test examiners should watch for questions of a conflicting nature in which there is a delayed decision to be made since in these cases respiratory responses apparently symptomatic of deception may appear.

It is further suggested that where respiratory responses symptomatic of deception have followed relevant questions in a criminal investigation the examiner should also check to determine whether similar responses occurred in the answer to irrelevant questions, such as "Is your name John," etc. The appearance of the criteria in response to the irrelevant questions should thus indicate a greater degree of caution in rendering a decision of guilty since all of the responses might have arisen as a result of a mental conflict due to misunderstanding of the subject's instructions, rather than from the emotional conflict arising from guilt or guilty knowledge alone.