

A Discussion of PLC and DLC Question Procedure and Ironic Process Theory*

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Abstract

Probable Lie and Directed Lie Comparison Questions are discussed within the framework of how they are used to generate appropriate levels of salience under the analytic theory of the polygraph. The authors provide a framework for the process of introducing both types of comparison question and discuss the concept of Ironic Process Theory as it applies to the Directed Lie Comparison Question. The authors discuss the Probable Lie process as a goal-oriented endeavor that requires manipulation of the examinee into denying commonplace transgressions and believing they must pass each question to pass the test. Finally, we offer examples of the introduction of both Directed and Probable Lie questions.

Try to pose for yourself this task: not to think of a polar bear, and you will see that the cursed thing will come to mind every minute.[Fyodor Dostoevsky, Winter Notes on Summer Impressions, 1863]

Introduction

Comparison questions are used in psychophysiological detection of deception (PDD) testing to provide a basis of recorded information to increase the objectivity, reliability, and reproducibility of analytic conclusion about deception or truth-telling in response to relevant test questions. Summers (1939) first described the use of what today is known as the comparison question test (CQT) format, consisting of a question sequence of three relevant question interspersed with three comparison question and three neutral questions, repeated three times – though some terminology differed from current usage. [Refer to Krapohl (1996) for a discussion about the evolution of terminology applied to these questions.] Use of the comparison question and comparison question test was promoted and popularized within the polygraph profession by Reid (1947), and others including Backster (1963) researchers at the University of Utah (Raskin & Hare, 1978; Kircher & Raskin, 1988; Bell, Raskin, Honts & Kircher, 1999), the U.S. Department of Defense (2006a), and the American Polygraph Association (2011).

Kubis (1962) first described the use of a Likert (1932) type integer scale to transform CQT data

into numerical values. Use of numerical scoring and Likert type numerical transformations using a 7-position scale was promoted and popularized within the polygraph profession by Backster (1963), along with researchers at the University of Utah (Bell, Raskin, Honts & Kircher, 1999; Kircher & Raskin, 1988; Raskin & Hare, 1978). The 7-position scoring methods was later modified to become a more objective 3-position ordinal rank scoring method by Van Herk (1990) and the U.S. Department of Defense (2006b), and subsequently became the basis for the Empirical Scoring System (Nelson, 2017; Nelson, Krapohl & Handler, 2008; Nelson et. al., 2011).

The CQT differs from earlier PDD test formats in the use of a comparison question against which responses to relevant questions can be juxtaposed for analysis. A comparison question is a polygraph test question intended to provide innocent or truthful persons an opportunity to answer a greater response-inducing question in relation to the investigation target stimulus or relevant question. The analytic theory of PDD testing is that greater changes in physiological activity are loaded at different types of test stimuli as a function of deception or truth-telling in response to relevant target stimuli. Although discussed here with regard to the CQT, this analytic theory can also be applied to the concealed information test (CIT), for which the different types of stimuli are the key-question and non-key questions, and also to the relevant-irrelevant test (RIT), for which the different types of stimuli are

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those to which a person may be deceptive or truthful. [See Nelson (2016) for a discussion of the analytic theory of the polygraph test.] Reactions to the test target stimuli can be compared with responses to comparison stimuli to calculate a statistical classifier for deception or truth-telling.

An important advantage of the CQT is that, in contrast to earlier test formats, it more readily accommodates some of the basic principles of scientific decision-making. One of those principles is the notion that all conclusions about the meaning of data from a scientific test or experiment are made with regard to other possible conclusions. Another important principle is that transformation of recorded data to numerical values, whether linear or non-parametric, can increase the objectivity and reliability of analytic conclusions compared to unstructured putative expert judgment. The purpose of any comparison question is to provide a basis of comparison that can support a more objective and reproducible numerical transformation and analysis of responses to relevant questions that describe the investigation target issues of a PDD examination. The CQT remains the most commonly used form of polygraph technique for both diagnostic exams – conducted in the context of a known allegation or incident – and screening exams – conducted in the absence of a known allegation or incident.

Two basic types of comparison questions are in use today: probable lie comparison (PLC) questions, and directed lie comparison (DLC) questions. For PLC questions the examinee is manipulated into answering *NO* where it is assumed that this verbal response is most probably incorrect. For DLC questions the examinee is instructed to answer *NO* though it is established and known that this answer is incorrect. Like all PDD questions, both PLC and DLC questions must be carefully reviewed during the PDD pretest interview. For reasons, both ethical and scientific, there are no un-reviewed questions during PDD testing. Of

these two types, the PLC is subject to greater controversy due to their inherently manipulative use and presentation. Some examiners mistakenly believe that PLCs will be ineffective unless adapted or customized to the individual and case circumstances. This has led to expressions of concern and criticism among scientists about standardization and reliability (NRC, 2003). DLC questions are more easily standardized and may offer some advantages because their effective use is less reliant upon psychosocial manipulation and subjectivity. However, no published information suggests any significant difference between the effect sizes for the two types of comparison question¹. [See Blalock, Nelson, Hander & Shaw (2011; 2012) for a discussion of the published literature on DLC questions.]

Neither DLC nor PLC questions should be misinterpreted as premised on an assumption that the polygraph measures lies *per se*. While past discussions about PLC questions have tended to emphasize emotion as a source of response, more recent discussion has centered on a plurality of factors that may contribute to responses to PDD test question – both relevant and comparison. These include emotion, cognition or mental activity, and behavioral conditioning. [Refer to Khan, Nelson Handler (2009) along Handler, Shaw and Gougler (2010) and Handler, Deichman, Kuczek, Hoffman and Nelson (2013) for further discussion about emotion and cognition in PDD testing.] It is neither possible nor necessary to know the exact emotion or exact cause of any emotion. In the same way, it is neither possible nor necessary to know the exact details of all mental activity and the various cognitive factors – which may include memory, attention, decision, novelty, and other factors – related to PDD test stimuli. Although we may want to know the details of an examinee's involvement in behaviors described by the relevant questions (RQs), it is similarly not necessary nor possible to know the exact details of a person's behavioral experience related to the comparison questions (CQs).

¹ There have been earlier discussions regarding “exclusive” or “non-exclusive” types of PLC questions. However, scientific studies have not supported the assumption of any real difference in effect-sizes from these two (Amsel, 1999; Honts & Reavy, 2009; Horvath & Palmatier, 2008; Horvath, 1988; Palmatier, 1991). Consequently, the discussion is moot for the exclusive CQ hypothesis, as it is not supported by evidence. Field practices have evolved to include both exclusive and non-exclusive CQs as indicated by individual circumstances. Discussion of PLC question herein includes both exclusive and non-exclusive types.



Polygraph Theory

To appreciate how polygraphs are intended to work, it is important to understand (1) the theory of the polygraph test, (2) relevant questions and their construction, and (3) the two types of comparison questions. The theory of PDD testing is premised on the fact that humans generate recordable physiological reactions to test stimuli – the RQs as well as to the CQs. The *analytic theory* of PDD testing is that greater changes in physiological activity are loaded at different types of test stimuli (i.e., RQs and CQs) as a function of deception or truth-telling in response to relevant target stimuli (Nelson, 2016). RQs refer to the investigation target issue, or topic of the polygraph examination, and are reviewed during the pre-test interview. CQs – whether DLC or PLC – are questions regarding integrity and deception in general and must also be carefully reviewed and correctly introduced in order to produce the desired effect. Many decades of study have confirmed the practical value and validity of this analytical theory – having shown that responses are loaded sufficiently to permit probabilistic inferences about deception that exceed chance expectations. The *analytic theory* of the PDD and CQT is the same whether comparison questions are of the PLC or DLC variety, and the same despite differences in their introduction and usage.

It is assumed that all test subjects want to pass the polygraph test – that is their goal. The test questions function as a challenge to the test subject's goal of passing the test. The amount of mental effort required to answer a test question truthfully or correctly versus deceptively (or incorrectly) has been discussed as an underlying mechanism for the physiological reactions to test questions. In this model, cognitive activity is associated with the challenge to the examinee's goal of passing the test, and gives rise to the changes in physiological activity that are observed and recorded during PDD testing. Questions that require more mental activity (because of a deceptive or incorrect answer) will, in general, produce the larger physiological responses (Barland & Raskin, 1973; Craig, 1998; Day & Rourke, 1974; Kircher, 1983; Waid, Orne, Cook & Orne, 1978).

Relevant Questions

Effective use or selection of investigation targets and formulation of RQs is fundamental to the effectiveness of the CQT. RQs will describe the examinee's involvement in the specific behaviors under investigation. RQs should be clear, concise and behaviorally descriptive so that a truthful person is sure they are answering truthfully. Answering truthfully to RQs should require little mental effort. If an RQ is overly broad, a truthful person may engage in excessive or unwanted mental activity due to confusion or ambiguity, or due to uncertainty about whether their answer is correct or true. It is possible that ineffectively formulated RQs can induce physiological responses from truthful persons that may be quantitatively similar to those of deceptive persons.

This cognitive effort hypothesis assumes that persons who answer truthfully to the RQs will be required to engage in mental activity that differs quantitatively from persons who are engaging in deception. Although it is difficult to evaluate directly the qualitative or quantitative content of responses to RQs, quantitative differences can be observed more easily by comparing responses to RQs with responses to CQs. This model also includes the possibility that quantitative differences in CQs may occur as a function of deception or truth-telling in response to RQs – where the cognitive demands of the RQs draw mental resources away from the CQs. It is also likely that emotional and behavioral conditioning factors play a role in differential responses to PDD test stimuli. Regardless of the exact mechanism of difference, studies have supported the analytic theory of the polygraph for the greater part of a century, and the differential salience of the RQs and CQs can be inferred, coded numerically, and used to calculate a statistical classifier for deception or truth-telling. The process of introducing the CQs can be considered of equal importance with the selection and introduction of RQs.

PLC Questions

CQs are intended to generate mental activity. As with RQs, CQs may also invoke emotional content and responses due to behavioral experience. Correct use of CQs is fundamental to the effectiveness of the CQT. As mentioned earlier, there are currently two approaches to the preparation and presentation of the com-



parison question that are generally accepted. Comparison questions can be presented as either a PLC or as a DLC question (Raskin & Honts, 2002). As shown in Table 1, the preparation and presentation will differ for DLC and PLC questions.

In the PLC approach, the examinee is manipulated by the examiner during the pre-test interview into denying transgressions that are often topically similar to that addressed by the RQs. For example, if the relevant questions address a reported theft of object of value, a PLC comparison question might be, "Have you ever stolen anything from another person?" It is also common to use the general topics of *lying and dishonesty* as information or topical content for CQs. For example: "Have you ever told a serious lie to get out of trouble with people in authority?" Introduction of PLC questions is an area of great variability in field practice, because individual personality attributes can play a role in the ambiguous communication and manipulation that are central to these questions. The following is a short example of PLC introduction dialog.

Now these next questions I'm going to ask you are just as important as the things we have been discussing, if you want to pass this polygraph test. Because you cannot pass this test if you are not telling me the truth. And that means the complete truth. One-hundred percent truth. This polygraph cannot tell the difference between a white lie and a serious lie, and cannot tell the difference between a half-truth and a lie. Just as there is no such thing as sort-of pregnant or partially pregnant, you are either an honest and truthful person – in which case you must already have told me the complete truth – or you may be the kind of person who says you are honest and truthful even though you are not. So, my question is just this: are you an honest and truthful person? Not just kind of honest, like when it is convenient. But really honest and truthful?

Now many people are not perfect in their honesty and integrity, and maybe they tell some lies. Maybe big lies. Serious lies. Maybe they do it a lot. Or, maybe they only lie sometimes – and they try to tell themselves they are an honest and truthful person, most of the time. But that is not honest and truthful and they know it. We all know it. Maybe they only tell small lies. Only to strangers, people that don't matter to them. But that is not honesty or truthfulness or integrity or trustworthiness. Maybe they only tell white lies, maybe only to people close to them. But that also is not honest or truthful. Anyone who would lie to the people close to them – to people that love and trust them – would lie to anyone. Of course, they would lie to get out of trouble, such as this situation. But you already told me you are not that kind of a person. So, unless you have been lying to me all along, these next questions should be super easy for you, because you already told me you don't lie to people who are trying to trust you, or people in authority, or to cover up something you have done wrong.

PLC questions are reviewed with a demeanor of subtle or overt judgment towards others who have engaged in the activities described by the PLCs. Examiners will attempt to give a plausible reason for the inclusion of the CQs in the PDD testing procedure – though without discussion of the actual purpose of the PLC questions. Most examinees will want to convey a positive impression of themselves to the examiner – or they will at least cooperate superficially. The social dynamics of the PDD testing situation is used to discourage examinees from making admissions, and to maneuver them into an answer that is most likely untrue – a probable lie. Examinees can also be maneuvered to agree that a test should be developed so as to provide them an opportunity to show that they are a trust-worthy person for whom the alleged theft or crime is uncharacteristic or unlikely.



In the review of PLC questions, the examiner will emphasize to the examinee that *they must pass every question to pass the test* – often stating to the examinee that they will fail the test if they lie to any question. This is intended to create the dilemma for the truthful person – and a perceived barrier to passing the test – in that they have falsely denied the behavior described by the PLC question. For example: “Have you ever lied to anyone who was trying to trust you?” RQs are expected to be the greatest barrier to passing the test for persons engaging in deception – for reasons that may involve both cognition, emotion, and behavioral experience – whereas the PLC questions are merely a procedural aspect of the test. Done effectively, truthful examinees will be cognitively and emotionally uncertain about their answers to PLC questions. They may be aware of having somehow been tricked into lying to the comparison questions during the pretest interview – and will ideally believe they may fail the test because of their responses to the PLCs. The examiner will admonish the examinee about the PLC topic, and in doing so will admonish the examinee against making any admission. If the examinee has already admitted anything or assented to the PLC topic, the examiner will develop the admonishment to prevent any further admissions.

So, at the end of this polygraph test I think you and I are both hoping that we can tell them you are an honest and truthful person, and not a liar or cheat or criminal of any kind. Because if you are innocent, if you did not do this [investigation target issue]. Then the only thing standing in your way is if you are honest and truthful enough to pass a polygraph test. If you are then that is great. But if you are not – if you are the kind of person that might do this – well then that is one of the things they will want to know. So if you think there is a chance that you are not able to be completely honest with me about things like your own personal honesty and integrity – if you have done things that would indicate that you are the type of person that could lie or cheat or betray the trust

of people close to you then we are going to need to talk and they are going to want to know what that is all about. What kind of person you really are. So, take a moment and think about this question and make sure you are not hiding something from me, not trying to hide something from yourself. Can you answer this question? Truthfully? Completely truthful. About whether you [besides that what you told me], have ever told a lie, a serious lie, to someone who loved or trusted you?

These example PLC dialogs are intended to be ambiguous and judgmental and psychologically over-bearing. They are intended to constrain the examinee into a desired answer, *NO*, while overtly appearing to give information and request information. In most interviewing contexts – including counseling, coaching, information gathering, consultation, leadership, investigation, and even interrogation – this manner of communication would be regarded as disrespectful and also ineffective at facilitating the exchange of accurate or real information. However, in the PLC context, accurate and real information is not the objective. Instead, the objective is to obtain only superficial compliance from the examinee – and to pretend to interpret this for rapport. The examinee will ideally be aware of the fact they are being inauthentic, aware that the polygraph examiner has been arbitrary and judgmental and insincere in their manner of questioning, uncertain about whether their answer to the PLC question will be satisfactory to pass the polygraph test, and conflicted emotionally and cognitively as to their choice of solution to the dilemma, and resigned to a posture of superficial cooperation instead of attempted discourse or other resolution. Examiners will accept the examinee’s superficial compliance as a form of acceptable rapport, and at no point in the process will the examiner use the word comparison or indicate the use of a PLC question.

Truthful persons should, ideally, know they are telling the truth in response to the narrowly constructed and behaviorally descriptive RQs. As before, the mental activity or cognitive



loading hypothesis holds that truthful persons will be more focused on, and will engage in increased mental activity, when responding to CQs than when answering truthfully to the RQs. Deceptive persons are expected to focus greater attention on, and exert more mental effort in response to, the RQs and the need to appear truthful than to the CQs. This is because – having engaged in the investigation target behavior as described – the RQs present the most substantial barrier to passing the test.

A traditional explanation among polygraph field practitioners in the past was the “psychological set” hypothesis (Matte & Grove, 2001) – citing Ruch (1948) – which attributed differences in physiological reactions to RQs and CQs to anxiety, apprehension and perceived threat to survival and well-being, subsumed as a fear of detection and consequences. A number of problems surround this hypothesis, beginning with the fact that the concept does not appear in the psychological literature as it was used within the polygraph profession. Handler and Nelson (2007) and Senter, Weather, Krapohl and Horvath (2010) pointed out that the narrow definition precluded this hypothesis from integrating the variety of hypotheses that have been proposed by psychologists and psychophysicists, and suggested the more general term *salience* as a more inclusive alternative.

Another burden of liability for the psychological set hypothesis is the troublesome citation of Ruch by Matte and Grove, for which Handler and Nelson found that neither the term nor a description of the hypothesis appear in the textbook. It is therefore not surprising that scientists have referred to some polygraph terminology as “Alice-in-wonderland-vocabulary” (Furedy, 1991). Even more concerning is that use of well-defined psychiatric terms such as anxiety, along with highly subjective concepts such as apprehension create a non-trivial, and possibly insurmountable, barrier in satisfying the generally held requirement that a hypothesis must be falsifiable to be held as scientific (Popper, 1959). Finally, there may be plausible reasons as to why an innocent person may experience greater fear of RQs than CQs. Some effort has gone towards the development of metaphors other than fear to help explain differences to RQs and CQs².

Despite the shortcomings of traditional PLC theory, persons who are engaging in deception in response to RQs are expected to produce greater changes in physiological activity to the relevant than to comparison questions (Offe & Offe, 2007), while truthful persons are expected to produce greater changes in physiological activity in response to PLC questions. Due to the complex social dynamics – which can involve a combination of education, training,

² An example of this is Ginton (2009) who reframed the fear of consequences metaphor as the “relative issue gravity” metaphor, for which attempts to explain the differences in response to RQs and CQs as a function of the gravity of the RQs, in a manner that may be consistent with results described by Offe & Offe (2007). In this usage, gravity can be regarded as an attraction force acting on the attention of the examinee, and can also be thought of as the seriousness of the relevant target issue. Although potentially useful as a discussion metaphor, this reframe of the “psychological set: hypothesis may not resolve the problem that RQs may present more gravity to innocent persons than CQs, and may still fall short of illuminating the underlying psychological processes. It is likely that a variety of mechanisms will continue to play a role in the discussion of responses to PDD test stimuli.

³ Concern has also been expressed toward the traditional fear-hypothesis for PLC questions, which emphasized emotion and fear of detection and consequences as the basis of response. Problems with this older hypothesis are numerous, and included the fact there are plausible reasons why a truthful or innocent person may experience greater fear of RQs than CQs. More importantly, PDD sensors and signal processing methods cannot differentiate the emotion of fear from anger, disgust or other strong emotions. Although emotions of different types may be a factor in responses, PDD technology cannot determine the reasons for an emotional experience or response. The traditional fear-hypotheses is also problematic because it ignores the role of cognition and behavioral conditioning, focuses solely on emotion as the basis of response, relies on problematic use of the psychiatric term anxiety, relies heavily on the subjective experience of apprehension, and conveys an impression that PDD questions and PDD testing equate to a threat to an examinee’s survival. Also, the fear hypothesis cannot adequately account for the similar effect sizes for PLC and DLC questions – prompting a need to update the working theory in lieu of rejecting or ignoring empirical evidence. Although perhaps useful at the time it was introduced, this older hypothesis no longer provides a satisfactory understanding or explanation for PDD testing. Contemporary PDD theory emphasizes a plurality of factors, including emotion, cognition and behavioral experience, emphasizes a testable and falsifiable statement of the effects that are expected to be observable in recorded test data, and attempts a discussion that can accommodate empirical evidence suggesting similar effect sizes for PLC and DLC questions.



and mission priorities for professionals, in addition to the potential for mental health, level of functioning, and developmental considerations for examinees – and the ethics of manipulation when using PLC questions, some scientists and credibility assessment experts have expressed concern about PLC questions³. Raskin and Honts (2002) suggested that DLC questions were developed, in part, as an effective alternative to the PLC for these reasons. Despite these concerns, there is a substantial body of laboratory and field research that supports the validity of the CQT with both DLC and PLC questions⁴.

DLC Questions

In the DLC approach, the examiner instructs the person to answer *NO* to the CQs⁵. The subject is told that it is important for the examiner to observe the normally expected physiological responses to the DLCs, otherwise the test will be inconclusive (Raskin & Honts, 2002), which will mean that they won't pass the test. A note here: many people will simplistically accept that answering *NO* to a DLC is a lie. Although the *NO* answer is incorrect, it is not actually a lie. A lie is an attempt to deceive another, to convince another to believe some statement or information that is factually inconsistent with reality. Examinees answer *NO* to DLC questions because they are instructed to do so. The DLC question is simply a procedure –

for which the name of the procedure is *directed-lie* – used to elicit physiological responses for comparison with physiological responses to the RQs. Notwithstanding this philosophical and epistemological nuance, examiners will, as part of the DLC procedure, explain to the examinee that, in fact, DLC questions are equally as important to the test results as are the questions about the investigation target issue. Examinees will increase their risk of not passing the test if they do not attend to and respond properly to the DLC questions.

One of the advantages of DLC questions is that the PDD test can be conducted in a factual and straightforward manner. Another advantage of the DLC approach is the potential for greater standardization – they are less reliant upon psychological manipulation and individual personality than PLC questions. However, examiner skill in understanding and using DLC questions will remain an important factor. DLC questions must be introduced correctly, or truthful and innocent examinees may easily fail to appreciate how important these questions are to their test results.

From a practical perspective, and for standardization, it is sometimes useful to organize the use of DLCs into a coherent process. Without a coherent and organized understanding of the DLC process there may be an increased risk that ineffective adaptations of the DLC

Table 1. Outline of the DLC and PLC processes.

	DLC	PLC
1.	Introduce and normalize the DLC topic	Introduce and stigmatize the PLC topic
2.	Obtain the examinee's endorsement and assent to some experience with the DLC topic	Tell the examinee they must pass every question to pass the test.
3.	Advise the examinee about the topic	Admonish the examinee about the topic
4.	Instruct the examinee to answer NO	Manipulate the examinee into denial
5.	Review the question and practice the answer	Review the question and practice the answer
6.	Repeat steps 1-5 for each DLC question	Repeat steps 1-5 for each PLC question
7.	Further explain the need for the DLC questions	Admonish the examinee further about honesty and integrity

⁴ Refer to the meta-analytic survey of validated polygraph techniques (American Polygraph Association, 2011) for more information. Also, see Offe and Offe (2007) for more information and the results of an experimental test of the analytic theory of the CQT.

⁵ Refer to Menges (2004) for a brief history on DLC questions.



question may contribute to problematic CQT outcomes. Nevertheless, while structure and organization are important, effective use of both DLC and PLC questions may require that the process be executed in a fluid and natural dialogue and not as a robotic or mechanized step-by-step procedure. Table 1 shows an outline of the basic processes for introducing DLC questions, in parallel with a process for PLC questions. Again, published studies have failed to show significant differences in effect sizes for PLC and DLC questions (Blalock Nelson, Handler and Shaw, 2011; 2012; Honts & Reavy, 2009).

Both DLC and PLC questions begin with an introduction of a question topic about a category of behavior related to honesty and integrity, or related in a general way to the investigation target issue. Both procedures review the question topic with a defined objective – to normalize (DLC) or stigmatize (PLC) the topic. DLC questions seek assent or endorsement of the topic, while PLC questions seek denial or avoidance of the topic. DLC questions rely on simple and clear instructions to answer incorrectly, whereas PLC questions rely on psychological manipulation to solicit a response that is assumed to be incorrect (i.e., a probable lie). Procedures for both the DLC and PLC question include a review of the exact language of the question that will be asked during PDD test data collection, and both procedures include a review, prior to the onset of the data collection, of the examinee's intended verbal response. Both DLC and PLC questions are formulated as closed questions – soliciting a *NO* answer – and require no other talking or discussion during data collection.

DLC questions produce physiological reactions and effect sizes similar to PLC questions, and can be understood as subject to some of the same psychological factors as PLC questions. The mental effort hypothesis holds that persons who are innocent and truthful in response to the RQs and investigation target issues will devote attention and mental activity to the DLC questions because these may present the greatest barrier or challenge to their goal of passing the test. As with PLC questions, it is likely that emotion, behavioral experience,

memory, and possibly that a variety of other psychological factors including the orienting response (Sokolov, Spinks, Naatanen, & Lyytinen, 2002), conditioned responses (Davis, 1961), arousal theory (Ben-Shakur, Lieblich & Kugelmass, 1970) and cognitive dissonance⁶ and other hypothesis may all play some role in psychophysiological response to DLC questions.

Regardless of whether field practitioners use DLC or PLC questions, we can expect that any unidimensional theory or hypothesis may be inadequate to explain the complexities of human psychology and physiology. Instead, it is more likely that an integration of various psychological theories and perspectives may be useful to more completely and more adequately understand the correlation between observable and recordable physiological reactions and PDD test questions.

Irony process theory and DLC questions

Irony process theory (IPT) refers to a psychological phenomenon wherein deliberate attempts to suppress or avoid certain thoughts (Wegner, 1989; 1994; 2009; Wegner & Schneider, 2003; Wegner, Schneider, Carter & White, 1987; Wenzlaff & Wegner; 2000) or emotions (Gross & Levenson, 1993; Geraerts, Merckelbach, Jelicic & Smeets, 2006) can induce the paradoxical or ironic effect. This results in increasing their occurrence or causing a person to become more immediately or acutely aware of those thoughts or emotions. In short, researchers have shown that although it may be possible to suppress emotion, as recorded through physiological activity associated with autonomic activity, under some conditions, the effects of suppression are reduced as a function of cognitive loading or mental activity. In the PDD testing context mental activity is induced by the need to attend to and respond deceptively to relevant test questions.

IPT may provide interesting insight on the results of a study conducted in the middle east wherein DLC questions worked well with examinees who were also polygraph examiners (Nelson, Handler, Blalock & Hernandez, 2012). IPT is potentially useful to PDD examiners in

⁶ See Handler and Nelson (2012) for an introduction to cognitive dissonance and its application to the polygraph context.



that it can help to understand and formulate an approach to DLC question formulation that requires neither overt psychological manipulation nor intrusion beyond the scope of the investigation target or referral issue.

The following is an example dialogue for each stage of the DLC process. An outside observer might be struck by the transparent nature of this procedure.

1. Introduce and normalize a DLC topic.

Now it's important to listen carefully, because this is something that is quite normal. People are only human, and that means all people are imperfect. People make mistakes. People make errors. Most normal people have made a mistake or error, and most of the time they take responsibility and fix it. But most normal people have also had some situation in which they may have made a mistake or an error and then kept it secret, or maybe they even told a lie about it. It's unfortunately common. People do the best they are capable of, and it's sometimes not perfect. If you are like most people, then you may have had this kind of situation. Most people, including those who are honest and truthful, have had such an experience where they had committed some mistake or error, and then, instead of accepting responsibility for the situation, they may have kept it a secret, or maybe even told a lie about it. Now perhaps this was as a young person, or, quite often, even as an adult.

The first objective, when introducing a DLC question, is to *normalize* the DLC topic for the examinee. It is important to note that to normalize a DLC topic is not to *trivialize* its importance on the exam. It is also important that examiners convey the notion that DLC question are *equal in importance* with RQs. Most importantly, each DLC topic must be introduced without criticism or stigma. A good strategy is to use common and comfortable

language while introducing the topic, while being careful to avoid expression of disapproval or reproach.

One way to increase the social comfort of an examinee while introducing a topic of potential discomfort is to make careful use of platitudes. Platitudes are superficial statements, often meaningless and factually unnecessary, that convey no actual message or information. Social platitudes can have the effect of increasing interpersonal comfort by stopping and replacing other, potentially more authentic, thoughts and communication. For example: the phrase “*Hi, how are you*” can be used as a friendly greeting, for which a common response is “*fine, and how are you,*” with little actual interest in the details of each other’s recent experiences. Platitudes allow people to interact in socially comfortable ways. Social platitudes can be useful because they allow people to greet each other and make contact in a friendly manner that also allows people to anticipate the quality and context of the ensuing interaction. In the context of introducing a DLC question, in the sample dialog above, phrases such as “*like most people*” are intended to reduce stigma, normalize the topic, and increase the comfort of the examinee. Done effectively, the topic will be introduced in a manner that does not prompt the examinee to assume a posture of denial or avoidance toward the DLC topic. Done effectively, the examinee will assent and endorse the DLC topic.

DLC topics are often related to integrity and deception. Following are some examples of DLC topics related to integrity and honesty.

- Secrecy or dishonesty to hide or avoid responsibility for a mistake or error.
- Secrecy or dishonesty to avoid responsibility for violating rules or regulations.
- Secrecy or dishonesty to avoid shame or embarrassment.
- Secrecy or dishonesty to impress others or make yourself look better.



The use of other DLC topics is also possible and DLC topics can sometimes be quite similar to PLC topics.

- Telling lies to people who loved or trusted you.
- Telling lies to a family member or friend.
- Telling lies to anyone in a position of authority.
- Telling lies to avoid consequences.

2. Obtain the examinee's assent and endorsement.

What I want you to do is just to think carefully about your past, your entire lifetime. You, like all people must have a lot of experiences. Some great, some not so great. So now, just tell me if you have ever had that type of experience. Have you ever done that or had that type of situation?

If the DLC topic is introduced and normalized in the correct way – using comfortable words, comfortable language, and comfortable platitudes – the examinee will answer YES, or will indicate their assent or endorsement in some manner. If an examinee does not endorse a DLC topic, it is often best to simply discard the planned DLC and select an alternative topic. It is sometimes useful for field practitioners to have a short list of planned DLC topics along with another short list of alternative DLC topics to use in the event that an examinee will not endorse one or more of the intended DLC topics. The following is an example of a list of alternative DLC topics.

- Ever making errors or mistakes.
- Violation of traffic laws (may not be useful in some cities or locales).
- Being disloyal to anyone.
- Engaging in lies or deception.
- Disappointing anyone.

Alternate DLC topics may tend to be even more commonplace and simple than planned

DLC topics. When an examinee does not endorse a second, alternate, DLC topic it may be an indication of other problems – possibly indicating an examinee who is deceptive or intends on nothing more than superficial compliance with the PDD testing process, and also possibly indicating that an examiner has been ineffective at comfortably normalizing a DLC topic. Regardless, in this case, selection of a PLC testing strategy may be more effective than continuing to attempt to work with DLC topics.

3. Advise the examinee about the DLC topic.

Now listen, whatever that was that happened, whatever you did, I do not need you tell me exactly what it was, or exactly who was involved. I don't need you to tell me exactly what your reasons were, or even exactly what the situation was. All of that is not what this test is all about.

The objective at this point is to bring some information about that memory or past behavior more prominently into the examinee's attention and awareness. However, it is neither necessary nor desirable to attempt to verify some memory of past behavior by soliciting the details. Having endorsed the DLC topic, examinees have already acknowledged some memory, whether vague or explicit, of some past behavior or incident that is consistent with the DLC topic.

In this example DLC dialog, you can observe the use of IPT in that subtle emphasis is given to the word *exactly*. The overt content of the communication conveys that the examinee should not provide the details regarding the behavior and statements at the time, other persons involved, context or situation, and motivation. However, IPT makes use of the fact that people generally know what serious faults, transgressions, and shameful or embarrassing details they would prefer never to reveal to others – especially strangers, colleagues and professionals who may exercise some form of judgment. For example, telling a person “it is not necessary for you to tell me your most personally embarrassing and shameful secret” can produce the paradoxical or ironic effect of alerting or prompting their working memory



to some awareness of details that were previously compartmentalized out of conscious awareness. Discussion of this type, using the principles of IPT, can prompt an examinee to recall important details, can do so in a manner that maintains the personal privacy and dignity of the examinee, and is not intrusive into personal issues that are outside the scope of a required investigation. Moreover, IPT allows us to begin to rely on unstated information as a basis of response to DLC questions.

4. Instruct the examinee to answer NO.

It's important that you to listen carefully to this question, and make sure you answer NO. Do you understand? OK, let's practice this question...

A strategy that is sometimes useful is to instruct the examinee to *listen carefully or think carefully* at each stage of the process. This must be done skillfully to avoid adopting an authoritarian demeanor prior to PDD test data acquisition. Done effectively, it can convey importance and increase an examinee's awareness of the need to listen carefully, and may also increase the attention and conscious awareness of examinee's who may have intended on not listening carefully as a form of strategic faking.

As discussed earlier, answering *NO* to a DLC question may be incorrect, but is not, in an epistemological sense, an act of deception. In other words, the examinee is not attempting to deceive the examiner when answering *NO* as instructed. Said differently, a DLC question, and the examinee's responses to a DLC question is a *procedure*. Answering *NO* to a DLC question is *incorrect*, but is not actually a *lie*. This is in no way problematic, because the polygraph does not measure or detect lies *per se*. Polygraph, like other scientific tests, measures and quantifies responses to test stimuli and enable us to make categorical classifications based on probabilistic inferences and correlations. Regardless of this nuance, if the examinee refers to a *NO* answer to a DLC question as a lie it will be a convenience to accept the examinee's usage, - perhaps by responding "*exactly like that*" - and proceed without admonishing or correcting this detail.

5. Review the question and practice the answer.

As an adult, did you ever make a mistake and then keep a secret or tell a lie about it? (NO)

Taking the time to carefully introduce each DLC question will ensure that examinees who are truthful or innocent, and who wish to cooperate, are prepared to understand and participate correctly in PDD testing. Although it may be possible to simply read a DLC question and instruct the examinee to answer *NO* in a matter of a few seconds, short-cutting the introduction of DLC questions may increase the likelihood of problematic testing outcomes, including an unknown increase in potential for inconclusive results as well as for false-positive or false-negative error. A carefully developed understanding of DLC questions and DLC procedure is among the most important ways to maximize the effectiveness of the polygraph test. Additionally, beginning each DLC similarly (and different from the RQ) may help the examinee more quickly recognize the question as a one to which they must respond incorrectly. This can be accomplished using time bars on DLC questions that differ from those of the RQs, and can also be done by strategically using phrases such as "did you..." or "did you ever..." for RQs and "have you ever..." for CQs.

6. Repeat steps 1-5 separately for each DLC question.

Pay careful attention now, because we are going to review another question similar to this one, but just slightly different in focus.

It may be tempting to review and practice all DLC questions together, thereby relieving the burden of making a separate introduction, soliciting a separate endorsement and providing a separate instruction for each DLC. *However, this is not advisable.* The process of introducing DLC questions should be considered equally as important as the topic and content of the DLC questions and verbal answers to DLC questions. DLC questions themselves are unlikely to replace the role and importance of the polygraph examiner in assuring that each examinee correctly understands the content



and the importance of the DLC questions. Taking the time to carefully (lather, rinse and repeat) introduce each DLC topic and question will provide an opportunity for an examiner to convey the importance of these questions, in the same way that carefully reviewing the RQs will ensure that examinees will understand and respond correctly to the topic or target of the investigation.

7. Further explain the need for these questions.

The reason I will ask you these questions is this: I want to see what your body does when you answer these questions. I want to know that your body is capable of reacting correctly when you lie to those other questions. I want to know that you will react. If you your body doesn't react to those questions, you could possibly lie to the questions about the (relevant issue) and remain un-noticed, and that would be a problem. Now, if for some reason your body cannot react correctly to these questions, then that could be a problem for you because you are going to have an inconclusive test. If you are telling the truth today then you do not want an inconclusive test, because that is not a passed test. If you are telling the truth about (relevant issue) then I want you to have the best results possible. So, I want to observe and record what happens and how you react when you answer these questions incorrectly. So, listen carefully to each of these questions, and answer just the way we have discussed and practiced. It is not necessary to make your body do anything. Just make sure that you listen carefully to every question and answer 'NO' just the way we have discussed. Whether you are telling the truth or lying your body will do what it is supposed to do. Do you understand?

PDD professionals who fully understand this process will execute it in a natural and fluid dialog – without explicitly emphasizing or conveying the structure and organization. This will be the most effective way to encourage truthful and innocent persons to cooperate authentically during the test. An overly mechanized or step-by-step execution can become problematic in that it may encourage a similar step-by-step form of participation and response during testing, and this may contribute to the appearance of unnatural, inauthentic, or feigned behavioral responses during testing. Although persons engaging in deception can often be expected to participate in ways that are superficially cooperative, the goal of the examiner will be to engage the examinee in a natural, though planned, dialog that will enable truthful and innocent persons to participate in a cooperative and natural manner during the recording and acquisition of PDD test data.

An easily avoidable failure mode can occur when an examiner has become bored with the process (as if polygraph work could ever become boring) and introduces the DLC questions while conveying the notion that they are not important and therefore deserve little time and attention. This is not limited to DLC questions, and can occur for all types of PDD questions. *The caution against professional boredom cannot be overstated.*

Some truthful and innocent examinees, because of the stress and acuity of the PDD examination, can have a heightened sense of social vigilance and may take notice of professional boredom and rote behavior. This may inadvertently lead them to conclude that DLC questions are not important. Competent expert PDD professionals will remain interested in their work, including each exam, each examinee, each step in the process and each question. For this reason, as discussed above, we consider it best practice to introduce and review each DLC question individually, carefully attending to the objectives of the DLC process at each stage. The end goal of the examiner will be to engage the examinee in attending to each of the DLC questions.

An important aspect of effective interviewing is the rapport or connection between persons. It is important to keep the dialogue and discus-



sion natural and fluid throughout the introduction of the DLC questions – and throughout the pretest interview. Examiners should strive to avoid a rigidly scripted presentation that can easily telegraph the fact that one is *interviewing-on-autopilot*. Interviewers who *talk past, to, at or above* others will be at risk for misinterpreting superficial compliance for rapport and will inevitably be less effective at than those who talk and listen *with* others.

Summary and discussion

We have provided a discussion of both PLC and DLC questions, along with a parallel process outline for the two types of CQs. We have also briefly discussed the analytic theory of the PDD test, and a number of psychological discussions that can be applicable to both PLC and DLC questions. In addition, we introduce Ironic Process Theory as it applies to the PDD test and the introduction of DLC questions. Both PLC and DLC questions require skill, training and some experience.

It is likely that both PLC and DLC questions will continue to be used in polygraph field practice, long into the future. However, DLC questions are easier to learn and easier to standardize because they are less dependent on individual personality or examiner subjectivity as variables that may influence their effective use. DLCs have been used in field polygraph examinations for almost 60 years. Numerous studies have shown the effectiveness of DLC questions in different languages and cultures involving almost two dozen researchers and scientists, including both laboratory and field studies, and involving everything from multiple issue screening topics to the most serious crimes in society. PLC questions, though well established in both polygraph research and field practice, will ultimately have greater vulnerability to potential problems such as *stomping-the-CQs* wherein a test may be loaded for truthful outcomes by over-discussion or over-emphasis on PLC content. Additionally, they may be vulnerable to criticisms of *soft-selling* PLCs wherein a test may be loaded to produce deceptive results, especially when an examiner uses the polygraph only as a *pro forma* for interrogation and only briefly discusses the PLC questions. DLC questions, because they are less dependent upon the influ-

ence of personality and persona on the tactical aspects of psychosocial manipulation, appear to offer greater potential for standardization – and there are favorable reports from polygraph field practitioners who make use of automation in both the pretest introduction and in-test presentation of DLC questions.

Although not discussed at great length, IPT may also be helpful to understanding the psychological basis of PLC questions, as well as to understanding other known phenomena during PDD interviewing and testing. Examples include why the discussion of breathing activity may contribute to increased problems with respiration data (Goodson et al., 2014) and why innocent persons who attempt countermeasure may increase their chances of producing test data that is interpreted as indicative of deception (Handler, Honts & Goodson, 2015; Nelson, 2015; NRC, 2003). IPT may also provide a mechanism for increased understanding of the responses of deceptive persons when answering relevant questions during PDD testing, but that is beyond the scope of this manuscript and may be a topic for another publication.

IPT is a simple theory with potentially simple mechanisms for usage in the PDD context, with practical application to DLC questions. We showed a series of sample dialogues for the process of introducing DLC questions using IPT, and provided explanations and rationale for effective usage along with points of caution about potential misunderstanding and misuse. These examples, and the related discussion and information are not intended to be taken as dogma, and should not be interpreted as intended to convey the only correct way to make effective use of DLC questions. There are, without doubt, other ways to introduce both DLC and PLC questions. Also, although it is sometimes necessary and helpful to discuss flaws in our applied theories and hypotheses as these become known, we do not, at this time, suggest that IPT or any theory is superior to other viable theories as applied to the PDD testing context. There are, without doubt, a variety of psychological theories that can be applied to PDD testing. It is our view that IPT is compatible with other operational theories such as mental-effort and goal-attainment, and that it can be useful to field



practitioners to add another layer of interesting discussion to our present understanding of both DLC and PLC questions.

The CQT remains the most commonly used form of polygraph technique for both diagnostic and screening polygraphs. Part of the reason for the prevalence of this is that CQT formats are easily amenable to numerical and statistical analysis methods that have served to make the polygraph test more objective and make polygraph test results more reliable and reproducible. Despite decades of use in both research and field practice, some confusion persists around both PLC and DLC field practices. The most obvious point of confusion is whether the polygraph records, measures, or detects lies *per se*; it does not. Another point of confusion and discussion has been the psychological basis of responses to RQs and CQs. It is our hope that discussion of DLC question, and this introduction to IPT, will be of some value.

All scientific tests are intended to quantify some phenomena of interest that cannot be subject to perfect deterministic observation or direct physical measurement. All scientific tests make use of proxy information that is correlated with those phenomena of interest, though not of itself the phenomena. Scientific tests are not expected to be infallible, and are only expected to quantify the level of confidence, margin of uncertainty, or strength of information in support of a conclusion or test result. Amenability of the polygraph test to reliable forms of analysis is, in large part, a function of the PLC and DLC questions. It is our hope that this manuscript may help to fill a gap in published information that reflects contemporary knowledge and contemporary PDD field practice with the CQT and DLC questions.



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