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Toward a New Paradigm in Deception Detection: A Psychological Perspective

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Abstract

This paper critically evaluates the theoretical foundations of contemporary polygraphy, arguing that current frameworks such as Psychological Set, Relevant Issue Gravity, and Preliminary Process Theory function primarily as descriptive labels rather than predictive scientific theories. The author contends that these models suffer from a lack of mechanistic depth, an over-reliance on the narrow construct of anxiety, and an outdated dichotomy between cognitive and emotional processes. To address these limitations, the paper proposes a transition toward a new paradigm grounded in modern affective science, specifically Scherer's Component Process Model (CPM). The CPM reframes polygraph reactivity as the distal outcome of a structured sequence of Stimulus Evaluation Checks—including relevance, implications, coping potential, and normative significance—that drive synchronization across organismic subsystems. By applying this framework to various testing formats, the paper demonstrates how physiological responses in the Comparison Question Test, Directed Lie Comparison, and Concealed Information Test can be understood as distinct appraisal pathways rather than direct indicators of deception. Finally, a three-phase research agenda is proposed to validate the role of subsystem synchronization and sequential appraisal in deception detection. This shift from detecting lies to mapping appraisals offers a scientifically grounded path to enhance the legal and professional credibility of the field.

Key words: theory, Component Process Model, polygraph reactivity, psychology, emotions

In recent years, the field of polygraph testing has made significant progress, moving towards more rigorous scientific methods and standardized practices. This shift has been driven by a greater emphasis on empirical research, technological innovations, and the integration of more sophisticated software to analyze physiological responses. A good example of this is the development of more objective scoring systems, which move away from subjective interpretations toward data-driven approaches aimed at improving the consistency and reliability of polygraph results.

At the same time, a review of the literature, especially works targeted at practitioners, reveals the lack of consensus on the mechanisms driving physiological responses during polygraph testing. While polygraph research and practice have applied various theoretical perspectives, there is no single, universally accepted framework to explain how to understand the connections between specific questions and question formats and psychophysiological reactions. Some of the concepts developed by polygraphers appear to lack a solid scientific foundation, with one notable example being the Psychological Set concept formulated by Backster (Krapohl & Shaw, 2015; Matte & Grove, 2001). Moreover, they often lack comprehensive empirical validation and exhibit inconsistencies with one another.

Therefore, the aim of this paper is to address this issue by exploring the physiological mechanisms behind the reactions observed during the examination. Drawing on psychological theories of emotion, this paper seeks to offer a more scientifically grounded understanding of how specific question formats engage structured appraisal processes that culminate in coordinated physiological responses. In doing so, it reframes polygraph reactivity as the outcome of goal-directed evaluation rather than a direct indicator of deception.

Understanding the underlying psychological mechanisms of responses in deception detection is crucial for advancing the field beyond reliance on anecdotal evidence or conceptual frameworks rooted in common sense or folk psychology. As Widacki (2022) notes, polygraph practitioners expect improvements to existing methods and seek scientific validation primarily to support their use in professional contexts, such as courtrooms or law enforcement. Therefore, grounding polygraphy in well-established scientific theories can significantly enhance the credibility of polygraphers' claims.

Theory Left (Often) Untold

Despite polygraphy being a widely used tool for deception detection, the theories that underpin its application remain fragmented and underdeveloped. Rather than being grounded in rigorous theories, polygraph examinations often operate on a patchwork of loosely defined concepts that focus more on practical application than on the deeper mechanisms at play.

Krapohl and Shaw (2015) identified four primary theories currently guiding the field of polygraphy: Psychological Set, Relevant Issue Gravity (RIG), Differential Salience, and Preliminary Process Theory (PPT). While these theories provide frameworks for many professionals, the theories do not appear to fully remedy the concerns regarding insufficient scientific foundation. This is particularly evident in the criticism of the now-classic Psychological Set, which only superficially aligns with psychological concepts. As demonstrated by Senter et al. (2010), the concept of psychological set is defined differently in mainstream psychology, making its application to polygraphy problematic. Furthermore, the theory's overfocus on a sense of threat and anxiety seems inadequate in explaining physiological responses during polygraph tests, as the emotional reactions involved are not always indicative of fear or anxiety.

The theory of Relevant Issue Gravity (RIG) attempts to move polygraphy toward a more scientific footing by positing that physiological responses are driven by an examinee's cognitive engagement with specific questions (Ginton, 2009). RIG assumes that responses arise from a focused attention on a stimulus and a subsequent feedback loop that sustains this engagement. While this represents a more grounded approach than earlier concepts, a closer examination reveals significant theoretical gaps.

The first major limitation of RIG concerns the nature of attention in a sequential testing environment. As Krapohl and Shaw (2015) noted, while attention is a necessary prerequisite for a response, it is not a sufficient cause in itself. Because polygraph questions are presented one at a time, they do not naturally compete for immediate cognitive resources in the way stimuli might in a cluttered environment. Consequently, RIG fails to explain why one question triggers a massive physiological shift while another, similarly attended-to question does not.

Moreover, in my view, RIG lacks integration with established models of stimulus engagement, such as, for example, the Biased-Competition Model of Attention (Desimone & Duncan, 1995). Although originally developed for visual stimu-

li, the principles of this model—where stimuli compete for neural representation and attention biases this competition—could provide the mechanism RIG lacks. Without such a foundation, RIG cannot explain how the brain prioritizes one "gravity" over another. This critique is further supported by Attentional Control Theory (ACT), which suggests that negative affect, particularly anxiety, impairs goal-directed attention and shifts focus toward threat-related stimuli (Eysenck et al. 2007) In a polygraph context, questions implying guilt act as these threat-related stimuli, causing a breakdown in attentional control. While ACT provides a useful framework for understanding this shift, its narrow focus on anxiety limits its utility as a comprehensive theory for polygraphy.

Ultimately, RIG functions more as a descriptive hypothesis than a mechanistic theory. It emphasizes that responses arise from how salient a question appears to an examinee, yet it lacks a clear explanation for how these subjective appraisals translate into physiological output. It overlooks well-established models of emotional salience, such as, for example, two-system framework for threat detection (LeDoux & Pine, 2016) or dual competition model (Pessoa, 2017). These frameworks suggest that physiological arousal in response to salient stimuli may arise from both reflexive threat appraisal and goal-directed modulation – a distinction relevant for interpreting psychological mechanisms active during polygraph testing. By ignoring these concepts, RIG remains a fragmentary construct that identifies the importance of salience but fails to explain the underlying processes.

Finally, Palmatier and Rovner (2015) propose the application of the Preliminary Process Theory (PPT) as a theoretical framework for polygraph testing. This theory posits that the physiological responses observed during such testing are not direct indicators of truth or deception, but rather reflections of the cognitive and attentional processes triggered when an individual is confronted with significant stimuli. Specifically, PPT emphasizes the role of the orienting response (OR) – an automatic physiological reaction to novel, meaningful, or otherwise salient stimuli. A core premise is that the greater the perceived significance of a stimulus, the stronger the elicited response. Accordingly, during a polygraph examination, a question related to a concealed memory or relevant act may evoke a more pronounced orienting response due to its heightened personal significance. Applied to the Comparison Question Test (CQT), PPT suggests that this format functions effectively because it creates a differential pattern of stimulus significance: for truthful individuals, comparison questions are more salient, whereas for deceptive individuals, relevant questions hold greater significance.

While I consider applying PPT on the polygraph grounds as a significant step forward, there are, however, major concerns that should be highlighted. Firs of all, as Palmatier & Rovner (2015) noted, PPT remains strongly rooted in earlier polygraph concepts based on determining "salience"—the importance of a stimulus and its capacity to attract attention. The absence of clear differentiation and added value leads to PPT being perceived not as a distinct, revolutionary idea, but rather as an extension or reinterpretation of existing paradigms concerning responses to significant stimuli.

The biggest issue with PPT is, in my view, framing of the polygraph reaction primarily as an orienting response. Orienting response, as conceptualized by psychophysiology literature, is fundamentally a reaction to novelty or change in the environment. In a polygraph setting, where questions are reviewed beforehand and repeated across multiple charts, the "novelty" of the stimulus is systematically neutralized. If the orienting response were the sole mechanism at play, one would expect a rapid decline in reactivity across successive charts due to habituation. The fact that reactions often persist suggests that higher-order cognitive processes, such as memory retrieval, emotional regulation, and evaluative threat appraisal, are exerting a top-down influence that the PPT framework does not fully capture.

Additionally, the reliance on OR creates a "black box" problem regarding the appraisal process. While PPT acknowledges that significance leads to a stronger response, it offers little insight into how significance is determined in the specific context of deception. It essentially replaces the problematic term "salience" with "significance" without explaining the psychological calculus used to weigh a comparison question against a relevant one. This lack of mechanistic detail means PPT functions more as a descriptive label for observed phenomena rather than a predictive scientific theory.

The collective critique of these theories highlights a fundamental lack of mechanistic depth and a reliance on fragmented constructs. Whether focusing on the outdated Psychological Set or the more modern Preliminary Process Theory, these frameworks tend to describe *that* a reaction occurs without explaining the specific psychological calculus of *how* or *why* it is triggered. Most significantly, these theories maintain an artificial separation between cognitive and emotional processes, a dichotomy that contemporary neuroscience and psychological research have long since abandoned. As, for example, Pessoa (2008) argues, the brain's functional architecture does not support a strict division between affective and cognitive regions; instead, complex behaviors and physiological responses emerge

from deeply integrated neural networks. In this light, the perceived conflict between "emotion" and "cognition" in polygraphy is a false one, as these systems are inextricably intertwined in the brain's attempt to evaluate stimulus significance. Ultimately, by failing to account for the dynamic, goal-oriented nature of human appraisal, current polygraph theory remains a patchwork of descriptive labels rather than a predictive scientific system.

In light of the shortcomings of existing frameworks, it is necessary to re-evaluate the role of emotional theories in explaining polygraph reactivity. Within the field, it is frequently argued that emotions are "not enough" to provide a comprehensive foundation for polygraph testing, primarily because the singular focus on anxiety has failed to account for the diversity of physiological patterns observed in practice. However, it is my view that this dismissal of emotional theory is premature and likely based on a narrow, outdated understanding of an affect.

First, the notion that emotional states are insufficient often stems from an over-reliance on primary, basic emotions—such as those described in Ekman's (1992) framework—which may not fully capture the nuance of a polygraph testing. If we move beyond basic fear or anxiety, we find a vast landscape of higher-order emotional states that are far more relevant to the polygraph context. Specifically, self-conscious emotions (such as shame or guilt) and moral emotions (such as a sense of indignation or betrayal of one's self-concept) offer a more accurate lens through which to view an examinee's reactions. These complex affective states are deeply tied to an individual's social standing and internal values, making them potent triggers for arousal.

Second, the claim that emotions are insufficient seems to ignore the vital structural and functional definitions of emotion. When emotion is properly defined as a multi-component process (structural; e.g. (Ellsworth & Scherer, 2003; Frijda, 1986; Lazarus, 1991) and as a system for signaling goal-significance (functional; e.g. Campos et al., 1994), it becomes clear that "emotion" and "cognition" are not two separate things competing to explain a reaction. Instead, they are parts of the same evaluative mechanism. By re-integrating these modern emotional perspectives, we can move away from the reductive "anxiety model" and toward a sophisticated theory that accounts for the dynamic complexities inherent in the polygraph examination.

The limitations identified across existing polygraph theories point to a common and unresolved problem: the absence of a mechanism that explains how a ques-

tion is transformed into a physiological response. Concepts such as psychological set, salience, or orienting response describe *that* a reaction occurs, but they do not specify the psychological operations through which stimulus evaluation produces measurable autonomic change. As a result, the field remains reliant on descriptive constructs that lack predictive precision. Addressing this gap requires a shift from stimulus–response descriptions to a model that specifies the intermediate psychological processes linking perception and physiology. Indeed, contemporary affective science provides such a framework by conceptualizing emotion not as a discrete state, but as a dynamic process emerging from ongoing appraisal.

The Component Process Model: Subsystem Synchronization and Appraisal

Within this perspective, Scherer's Component Process Model (CPM; Scherer, 1987; Scherer, 2005) offers a comprehensive and mechanistic account of how physiological responses are generated. Rather than positing a single trigger such as anxiety or novelty, the CPM conceptualizes each response as the outcome of a sequence of Stimulus Evaluation Checks (SECs), through which the organism continuously assesses the significance of an event for its goals and self-relevant standards (Scherer, 1993, 2009). These checks—relevance, implications, coping potential, and normative significance—operate in a fixed temporal sequence and cumulatively determine the intensity and quality of the response.

In this framework, the physiological signals recorded during a polygraph examination are not direct indicators of deception, nor are they reducible to generalized arousal. They are the distal outcomes of a structured appraisal process that evaluates how a given question relates to the examinee's goals, perceived threats, and internal standards. A response emerges when this evaluative sequence produces a high degree of synchronization across organismic subsystems, particularly within the autonomic nervous system measured by the polygraph.

This reconceptualization resolves the central weaknesses of prior theories. It replaces vague notions of "salience" or "significance" with a defined sequence of appraisal operations, explains why similar stimuli can produce different reactions depending on the individual's goals, and accounts for the persistence of responses even in the absence of novelty. Most importantly, it provides a unified meta-mechanism: physiological reactivity reflects the outcome of appraisal-driven subsystem synchronization, while variation across polygraph formats arises from differences in how specific questions engage this evaluative process.

The following sections apply this framework to specific testing formats, demonstrating how distinct patterns of reactivity emerge from systematically different appraisal pathways.

Predicting Reactions Across Polygraph Formats

The Component Process Model allows polygraph reactivity to be specified as the outcome of distinct appraisal sequences, rather than as a unitary "response to deception." Within this framework, the physiological activity recorded during an examination reflects the peripheral efference component of a synchronized emotional episode, emerging from a structured sequence of Stimulus Evaluation Checks. Crucially, different polygraph formats elicit different configurations of these checks, depending on how questions engage the examinee's goals and self-relevant standards.

In the Comparison Question Test (CQT), deceptive and truthful examinees diverge at the level of appraisal. For a deceptive individual, relevant questions are processed as highly goal-relevant, as they directly threaten the primary goal of avoiding detection. This is followed by an implication check in which the stimulus is appraised as strongly goal-obstructive, given its potential consequences. The coping potential check typically yields low perceived control, further amplifying the response. This sequence—high relevance, strong goal obstruction, and low coping potential—produces a high degree of subsystem synchronization, resulting in a pronounced physiological reaction.

For truthful examinees, relevant questions are generally appraised as goal-conducive, as answering truthfully supports the goal of exoneration. Consequently, these questions elicit relatively weak synchronization. In contrast, comparison questions engage a different appraisal pathway. Rather than threatening external outcomes, they implicate internal standards. Through the normative significance check, the examinee evaluates the question against their self-concept and moral identity. When the question implies past wrongdoing, it creates a discrepancy between the stimulus and the individual's standards, generating a form of goal obstruction at the level of self-evaluation. This appraisal sequence—moderate relevance combined with normative incongruence—can produce a level of synchronization comparable to that seen in deceptive individuals responding to relevant questions.

From a CPM perspective, the CQT does not differentiate "lies" from "truth," but rather contrasts two types of appraisal: externally oriented goal-threat appraisal in deceptive individuals and internally oriented normative appraisal in truthful indi-

viduals. Similar physiological outputs emerge not because the underlying processes are identical, but because both pathways converge on high subsystem synchronization.

A similar logic applies to Directed Lie Comparison (DLC) formats, though the underlying appraisal structure differs. For truthful examinees, the directed lie is embedded within the overarching task goal of successfully completing the examination. As a result, the stimulus is appraised as highly goal-relevant, and—critically—as goal-conducive, because performing the instructed deception is perceived as necessary for demonstrating cooperation and credibility. This appraisal engages the implication check in a positive direction (goal facilitation), while the coping potential check reflects high perceived ability to execute the task correctly. The result is increased allocation of cognitive and physiological resources to the directed lie, producing measurable synchronization.

For deceptive examinees, however, the appraisal is dominated by the relevant issue. Relevant questions carry maximal goal relevance and strong goal obstruction, which prioritizes them within the evaluative sequence. In this context, the directed lie is appraised as comparatively low in urgency and significance. Although it may still be processed as goal-conducive at a task level, it does not compete effectively with the threat posed by relevant questions. Consequently, it elicits weaker synchronization.

Thus, the effectiveness of DLC formats can be understood as a redistribution of appraisal weight across stimuli: for truthful individuals, the directed lie becomes a focal point of goal-directed processing, whereas for deceptive individuals, it remains secondary to the primary threat. However, it should be emphasized that this mechanism depends heavily on the examinee's cognitive engagement with the instructions. If the examinee perceives the directed lie merely as an artificial technicality rather than a critical task demand, the appraisal of goal relevance and urgency may diminish, leading to weaker subsystem synchronization. Thus, while the CPM framework for DLC formats remains theoretically grounded, it also suggests that their practical efficacy is closely tied to individual task-oriented motivation and to the examiner's ability to establish the perceived significance of the instruction.

Moreover, while traditional polygraph frameworks frequently struggle to explain why an innocent individual might react strongly to a comparison question, the CPM conceptualizes this phenomenon as a goal-relevant reaction. When an innocent examinee chooses to answer a comparison question dishonestly, the act of

lying introduces an immediate, localized situational threat. The examinee's primary overarching goal remains to pass the test and maintain overall credibility. Consequently, the comparison question triggers a high-relevance check followed by an implication check, as the potential detection of this specific lie is appraised as highly goal-obstructive to the broader objective of being perceived as trustworthy. This psychological calculus leads to an intense allocation of cognitive resources and subsequent subsystem synchronization. The CPM thus provides a possible explanation for the reactivity observed in dishonest innocent individuals, framing their responses not as an anomaly, but as a direct outcome of immediate, goal-directed processing.

The CPM also provides a mechanistic account of memory-based formats such as the Concealed Information Test (CIT). Rather than treating the response as a passive byproduct of recognition, the model conceptualizes it as an appraisal-driven process. When a critical item is presented, it is first detected as distinct from neutral alternatives (novelty check), but this alone is insufficient to generate a strong response. The key step occurs at the relevance check: for an examinee with concealed knowledge, the recognized item is appraised as highly relevant to the goal of remaining undetected.

This triggers an implication check in which the stimulus is evaluated as goal-obstructive, as the recognition signals a potential breach in concealment. The coping potential check often yields low perceived control, given that recognition is automatic and cannot be suppressed. This sequence leads to rapid synchronization across subsystems, producing the observed physiological response.

Importantly, this account explains why recognition alone does not always produce strong reactions. Only when recognition is integrated into a goal-relevant and goal-obstructive appraisal does it result in full synchronization. In this sense, the CIT effect reflects not memory per se, but the appraisal of memory as a threat to ongoing goals.

Across all formats, the CPM provides a unifying principle: physiological reactivity reflects the outcome of structured appraisal sequences, and differences between tests arise from how specific stimuli engage relevance, implication, coping potential, and normative significance. This shifts the interpretation of polygraph data from detecting deception to identifying the configurations of appraisal that produce synchronized physiological responses.

How to Move Forward: Research Agenda to Test the CPM in Polygraph Context

To transition the Component Process Model from a theoretical proposal to an empirical reality in the field of detection of deception, I propose the following research agenda. This plan focuses on isolating the sequential Stimulus Evaluation Checks and measuring the resulting subsystem synchronization that Scherer (2009) identifies as the hallmark of an emotional episode.

Phase 1: Validating Subsystem Synchronization

The first priority is to move beyond analyzing single physiological channels (e.g., skin conductance) and instead measure the "synchronization" of multiple organismic subsystems.

1.1. Multimodal Physiological Profiling Researchers should conduct Comparison Question Tests (CQT) while simultaneously recording a wider array of subsystems: peripheral efference (polygraph), motor expression (high-frame-rate facial micro-expression analysis), and central nervous system activity (EEG or fMRI).

• **Hypothesis:** Significant polygraph questions (Relevant for deceptive, Comparison for truthful) will show a higher degree of statistical coherence and synchronization across these different channels compared to neutral or habituated stimuli.

1.2. Time-Series Analysis of SECs Using high-resolution EEG, researchers can track the temporal sequence of appraisals. Scherer posits a fixed sequence (Novelty > Relevance > Goal Conduciveness > Coping > Normative Significance).

• **Hypothesis:** Event-related potentials (ERPs) will reveal a sequential processing of questions that follows this order, with the "Significance" of a polygraph response being determined by the cumulative result of these checks.

Phase 2: Experimental Manipulation of SECs

This phase aims to prove that by manipulating specific appraisal dimensions, we can predictably change the physiological output.

2.1. Manipulating Goal Conduciveness and Urgency In a mock-crime scenario, researchers can vary the consequences of detection. For one group, the "Goal Obstruction" (failing the test) results in a minor penalty; for another, a major penalty.

• **Hypothesis:** Increased goal urgency and lower conduciveness will lead to linear increases in autonomic synchronization, validating the CPM's predictive power over traditional "fear" models.

2.2. Isolating Normative Significance in Truthful Subjects To understand "false positives," researchers can manipulate the wording of comparison questions to vary the level of "moral threat" (Normative Significance).

• **Hypothesis:** Truthful participants will show higher physiological synchronization when a comparison question is framed as a direct challenge to their moral identity rather than a general inquiry into past behavior.

Phase 3: Applying CPM to Memory and Task-Based Formats

3.1. The "Memory-Appraisal" Link in CIT In Concealed Information Tests, researchers should compare responses to "guilty" items that have high goal-relevance versus those that are recognized but have no impact on the examinee's safety (e.g., items the examinee was told are "irrelevant" to the investigation).

• **Hypothesis:** Recognition alone (Novelty) will produce a smaller, fragmented response, whereas recognition paired with Goal Obstruction will produce full subsystem synchronization.

3.2. Directed Lie Task-Demand Analysis By varying the perceived importance of "Instructional Compliance" in DLC formats, researchers can test the "Task-Oriented Goal" hypothesis.

• **Hypothesis:** Truthful examinees who are told the test's accuracy depends entirely on their reaction to the directed lie will show significantly higher synchronization than those told the directed lie is merely a technicality.

This research plan shifts the focus of polygraph science from "detecting lies" to "mapping appraisals." By validating that physiological reactions are the distal outcome of a goal-oriented evaluation process, the field can finally provide the scientific validation required for legal and professional credibility.

Limitations of the Concept

Although the Component Process Model offers a more mechanistic and integrative framework than traditional polygraph theories, several important limitations must be acknowledged.

First, the CPM does not fully solve the central "black box" problem underlying polygraph reactivity. While the model specifies a sequence of appraisal operations through which stimuli are evaluated, it still cannot definitively explain how a par-

ticular configuration of appraisals is transformed into concrete autonomic output. In this sense, the framework shifts the explanatory level from simple notions such as "salience" or "psychological set" toward structured appraisal processes, but it does not yet provide a complete neurophysiological account of response generation.

The proposed model also remains partially inferential. The existence and temporal ordering of Stimulus Evaluation Checks are theoretically grounded in affective science, yet directly measuring these processes during polygraph examinations remains methodologically difficult. Consequently, proposed mechanisms currently rely on indirect interpretation of physiological and behavioral indicators rather than direct observation of appraisal dynamics themselves.

Moreover, although the CPM appears capable of explaining many phenomena observed in Comparison Question formats, its explanatory power may differ across testing paradigms. In particular, the framework currently offers a stronger account of truthful examinees reacting to comparison questions than of deceptive or innocent responses in Directed Lie Comparison formats. Similarly, some false-positive reactions may emerge from appraisal pathways unrelated to deception itself, including ambiguity, uncertainty, task interpretation, self-conscious emotions, or individual differences in moral self-evaluation.

Finally, the model does not claim that polygraph examinations measure deception directly. Rather, the CPM conceptualizes physiological reactivity as the outcome of appraisal-driven synchronization processes related to goal relevance, coping potential, and normative significance. As a result, the framework explains why deception may produce physiological responses, but it also predicts that similar responses can emerge from psychologically distinct states that share overlapping appraisal structures.

Conclusion: Toward a New Paradigm in Deception Detection

The evolution of polygraphy from a practice rooted in folk psychology to a rigorous forensic science requires more than just technological advancement; it demands a robust, mechanistic theoretical foundation. As this paper has demonstrated, traditional frameworks—from the early concept of Psychological Set to more modern iterations like Preliminary Process Theory—have provided valuable stepping stones but ultimately remain descriptive rather than explanatory. By maintaining an artificial dichotomy between "cognition" and "emotion," and by

over-relying on the narrow construct of anxiety, these theories fail to capture the dynamic, multi-layered psychological calculus performed by an examinee during a polygraph test.

The proposal to adopt Scherer's Component Process Model offers a path forward that aligns polygraphy with contemporary affective science. By reframing the physiological responses on a polygraph chart as the distal outcomes of sequential Stimulus Evaluation Checks, we can finally explain the "how" and "why" of reactivity across diverse formats. Whether it is the goal-threat appraisal of a deceptive examinee in a CQT, the moral-identity appraisal of a truthful person facing a comparison question, or the goal-oriented task compliance seen in Directed Lie formats, the CPM provides a unified explanation based on subsystem synchronization.

Ultimately, shifting our focus from "detecting lies" to "mapping appraisals" transforms the polygraph from a controversial "stress detector" into a sophisticated tool for measuring stimulus significance. The research agenda outlined herein provides a roadmap for validating this model through multimodal profiling and time-series analysis, offering the empirical evidence necessary to meet the high standards of modern legal and professional contexts. By embracing the complexity of the human appraisal process, the field of polygraphy can move beyond fragmented constructs and establish itself as a credible, scientifically grounded discipline within the broader landscape of psychological research.

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