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Signals™

A Framework for Understanding Human Behaviour as
System Output

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Abstract

Behaviour is often interpreted as evidence of personality, intention, or stable character. Yet research across neuroscience, stress physiology, cognitive science, executive functioning, and predictive processing demonstrates that human behaviour varies considerably as biological and environmental conditions change. The same individual may think clearly in one context, become overwhelmed in another, and recover once conditions improve. These shifts are frequently interpreted as inconsistency when they may instead reflect normal variation within a dynamic biological system.

Signals™ proposes a systems framework for understanding behaviour as observable output rather than identity. The framework introduces three interacting variables—**state, load, and capacity**—and proposes that behavioural signals emerge from their ongoing interaction rather than from stable personal characteristics alone. Expressed conceptually as:

$$\text{Signal} = (\text{State} \times \text{Load}) \div \text{Capacity}$$

the model provides a practical structure for interpreting behavioural variability without reducing behaviour to personality, motivation, or pathology.

Rather than asking what behaviour says about a person, Signals™ asks a different question: *What conditions are producing the behaviour being observed?* By integrating established findings from multiple scientific disciplines into a single interpretive framework, this paper offers a conditions-based approach to behavioural understanding that is applicable across education, healthcare, leadership, parenting, organizational systems, and everyday relationships.

Its contribution is not the proposal of a new biological mechanism, but the introduction of a coherent framework for organizing existing knowledge into a more accurate interpretation of human behaviour.

1. Introduction

In *Behaviour Is Not Identity*, behaviour was distinguished from the conclusions commonly drawn about it. Observable behaviour provides information, but it cannot, on its own, establish who a person is. The next question naturally follows: if behaviour is not identity, then what is it?

This paper proposes that behaviour is best understood as the observable output of a biological system operating under changing conditions.

Across psychology, education, medicine, leadership, and everyday life, behaviour is often explained through relatively stable characteristics such as personality, motivation, discipline, or intention. While each of these perspectives contributes useful insight, none adequately explains one of the most familiar observations about human behaviour: the same person can behave very differently under different conditions.

An experienced teacher may remain patient throughout one school day and become irritable by the end of another. A confident leader may communicate with clarity in one meeting and struggle to think under pressure in the next. A student who demonstrates curiosity and engagement one week may appear withdrawn or overwhelmed the following week. These changes do not necessarily represent changes in identity. More often, they reflect changes in the conditions under which behaviour is being expressed.

Scientific research has repeatedly demonstrated that stress, cognitive demand, physiological state, emotional load, sleep, environmental context, and available cognitive resources influence perception, attention, decision-making, emotional regulation, and behavioural flexibility (Diamond, 2013; Starcke & Brand, 2012; Sterling, 2012). Human behaviour is therefore better

understood as dynamic than fixed, responding continuously to changes occurring within both the individual and the surrounding environment.

Despite this, behavioural interpretation frequently seeks singular explanations. Behaviour is attributed to personality, diagnosis, motivation, or character, even though biological systems rarely operate through a single cause. Human functioning emerges from the interaction of multiple variables occurring simultaneously.

Signals™ proposes that behaviour should be interpreted in the same way.

Rather than viewing behaviour as the direct expression of identity, this framework understands it as the observable output of a dynamic system. Three variables—state, load, and capacity—interact continuously to influence how behaviour is expressed at any given moment. Changes in any one of these variables may alter behavioural output without requiring any corresponding change in the individual themselves.

The purpose of this paper is to introduce that framework. It is not intended to replace existing psychological, neurological, or behavioural models, but to provide an organizing structure that integrates established knowledge into a practical system for interpreting human behaviour. By shifting attention from identity to conditions, Signals™ offers a different way of understanding why behaviour changes, what those changes may represent, and how more accurate interpretation can improve both understanding and intervention.

2. Why Behaviour Requires a Systems Framework

Human behaviour is often explained through a single dominant cause. A person's actions are attributed to personality, motivation, discipline, emotional maturity, diagnosis, or intention, depending on the context in which the behaviour occurs. Each of these perspectives contributes valuable insight, yet none fully accounts for one of the most familiar characteristics of human behaviour: its variability.

The same individual may demonstrate patience under one set of conditions and frustration under another. They may think clearly when rested, struggle when cognitively overloaded, recover after adequate sleep, or become emotionally reactive during periods of sustained stress. These changes are not unusual. They reflect the normal responsiveness of biological systems to changing internal and external conditions.

This presents an interpretive challenge. If behaviour changes as conditions change, then behaviour cannot be understood accurately by examining the individual alone. The conditions within which behaviour emerges must also be considered.

Systems thinking offers a useful way of approaching this problem. Rather than searching for a single cause, systems models examine how multiple variables interact to produce an observable outcome. Weather is not explained by temperature alone. Ecosystems are not explained by a single species. Likewise, human behaviour rarely results from one variable operating in isolation. It emerges from the continuous interaction of multiple processes occurring simultaneously.

SignalsTM applies this systems perspective to behavioural interpretation. Rather than asking what behaviour says about a person's identity, it asks how current conditions are interacting to produce the behaviour being observed.

Within this framework, behaviour is understood as a signal: an observable output generated by a dynamic biological system responding to changing conditions. Interpreting that signal requires attention not only to the behaviour itself, but also to the variables that shape its expression.

The framework proposed in this paper identifies three interacting variables that consistently influence behavioural output: **state**, **load**, and **capacity**. Together, they provide a practical structure for understanding why behaviour changes, why the same individual may function differently across contexts, and why behavioural variability often reflects changing conditions rather than changing identity.

3. The Signals™ Framework

Within this framework, a **signal** is defined as the observable output of a biological system responding to changing internal and external conditions. Behaviour is therefore understood as information about the current state of the system rather than direct evidence of personality, intention, or identity.

Signals are observable. They can be seen in behaviour, communication, emotional expression, decision-making, physiological responses, and patterns of action or inaction. They are also dynamic. As conditions change, signals change. The same individual may express different behavioural signals across different environments or at different points in time without any corresponding change in identity.

Understanding behaviour as a signal shifts the focus of interpretation. Rather than asking what a behaviour reveals about who someone is, the framework asks what conditions may be contributing to the behaviour being observed.

This distinction is consistent with systems-based approaches found throughout biology, physiology, and cognitive science, where observable outputs are understood as the product of interacting variables rather than isolated causes. Human behaviour is approached in the same way. It is not explained by a single characteristic but emerges from the interaction of multiple conditions operating simultaneously.

Signals™ organizes those conditions into three primary variables:

- **State** — the system's current physiological and neurological condition.
- **Load** — the total demands being placed upon the system.
- **Capacity** — the resources currently available to respond to those demands.

Together, these variables provide a practical framework for interpreting behavioural output.

Conceptually, the relationship can be represented as:

$$\text{Signal} = (\text{State} \times \text{Load}) \div \text{Capacity}$$

This equation is not intended as a mathematical measurement. Rather, it is a conceptual model illustrating how behavioural signals emerge from the interaction of state, load, and capacity.

As physiological activation increases, demands accumulate, or available capacity declines, behavioural signals often become more intense, less flexible, and increasingly protective.

Conversely, when state becomes more regulated, load decreases, or capacity expands, behavioural output typically becomes more adaptive, consistent, and responsive to the present environment.

Viewed through this framework, behaviour is no longer interpreted as a fixed personal characteristic. It becomes observable evidence of a dynamic system responding to the conditions it is currently navigating.

4. State

The first variable within the Signals™ framework is **state**.

State refers to the nervous system's current physiological and neurological condition. It reflects the body's level of activation at a given moment and influences how information is perceived, processed, and acted upon. Unlike personality, state is dynamic. It changes continuously in response to internal processes and external conditions.

Research across neuroscience and stress physiology demonstrates that changes in physiological state influence attention, emotional regulation, decision-making, memory, and behavioural readiness.

Under conditions of heightened activation, attention narrows, threat detection increases, and behavioural flexibility often decreases. When the nervous system is more regulated, individuals generally demonstrate greater cognitive flexibility, emotional tolerance, and capacity for deliberate action.

Importantly, state does not determine behaviour on its own. Rather, it shapes the context within which behaviour emerges. Two people experiencing the same situation may respond differently because their nervous systems are operating in different states. Likewise, the same individual may respond differently to an identical situation on different days depending on their physiological condition at that moment.

Within the SignalsTM framework, state functions as a sensitivity variable. Elevated states tend to amplify behavioural signals, increasing the intensity and urgency with which behaviour is expressed. More regulated states reduce unnecessary amplification, allowing behaviour to become more flexible, proportional, and responsive to present conditions.

Understanding state helps explain why behaviour is often inconsistent across time without requiring any change in identity. Behaviour changes because the system through which behaviour is expressed is itself changing.

5. Load

If state describes the condition of the system, **load** describes the demands being placed upon it.

Load refers to the cumulative physical, cognitive, emotional, social, and environmental demands a person is carrying at a given moment. Some demands are obvious, such as a heavy workload, illness, or acute stress. Others are less visible, including unresolved conflict, sustained uncertainty, caregiving responsibilities, financial pressure, grief, chronic pain, or the ongoing effort required to adapt to challenging environments.

Load is cumulative. Individual demands that appear manageable in isolation may become overwhelming when experienced together. A person who is physically tired, emotionally preoccupied, facing time pressure, and attempting to solve a complex problem is not carrying four separate demands. They are carrying a system-wide increase in load.

Research across cognitive psychology and stress physiology has consistently shown that increasing demand reduces processing efficiency, impairs executive functioning, narrows attention, and increases the likelihood of error, particularly when demands begin to exceed the resources available to manage them. These effects are not evidence of reduced intelligence or diminished character. They reflect the predictable behaviour of biological systems operating under increasing demand.

Within the Signals™ framework, load functions as a demand variable. As load increases, the system must devote more resources to maintaining performance, emotional regulation, and physiological stability. Behavioural signals often become more intense, fragmented, or protective, not because the individual has fundamentally changed, but because the conditions under which the system is operating have changed.

Importantly, load is not inherently harmful. Challenge, effort, and responsibility are essential aspects of healthy human functioning. Problems arise when cumulative demand persistently exceeds the system's available capacity or when adequate opportunities for recovery are absent. Under these conditions, behavioural changes become increasingly understandable as responses to sustained load rather than evidence of enduring personal characteristics.

6. Capacity

If load represents the demands being placed upon the system, **capacity** represents the resources available to meet those demands.

Capacity is the system's available ability to perceive, process, regulate, recover, and respond effectively under current conditions. It is neither fixed nor limitless. Rather, it fluctuates continuously in response to physiological state, cumulative load, health, recovery, development, experience, and environmental support.

Capacity is often mistaken for competence. When someone struggles to concentrate, regulate their emotions, solve problems, or communicate effectively, observers frequently conclude that the

individual lacks ability or motivation. Yet the same person may demonstrate exceptional judgement, creativity, patience, or resilience under different conditions. The difference is not necessarily who they are, but how much capacity is available to them in that moment.

Capacity encompasses multiple interacting resources. These include cognitive resources such as attention, working memory, and executive functioning; physiological resources including energy, sleep, and physical health; emotional resources such as distress tolerance and emotional regulation; and relational or environmental resources, including safety, predictability, social support, and access to recovery. Together, these determine how much demand the system can absorb before behavioural output begins to change.

Within the SignalsTM framework, capacity functions as a moderating variable. As available capacity increases, the system is better able to accommodate rising demands while maintaining flexibility, judgement, and behavioural stability. When capacity decreases, even ordinary demands may become difficult to manage. Behavioural signals often become more protective, more reactive, or more constrained—not because the individual has become less capable, but because fewer resources are available to support adaptive functioning.

Understanding capacity helps explain one of the most common misconceptions in behavioural interpretation: the assumption that performance reflects potential. Behaviour always reflects what the system was able to access under the conditions present at that moment. It does not necessarily reflect everything the individual is capable of under different conditions.

For this reason, capacity should not be understood as a measure of worth, intelligence, character, or motivation. It is a measure of availability. As conditions change, capacity changes. When capacity changes, behaviour often changes with it.

7. Behavioural Variability as System Output

One of the central assumptions underlying the Signals™ framework is that behavioural variability is not, by itself, evidence of inconsistency or instability. Rather, variability is an expected characteristic of dynamic biological systems responding to changing conditions.

Human behaviour does not emerge from a fixed internal state. It changes continuously as physiological activation, cumulative demand, and available capacity change. Consequently, the same individual may think clearly in one context, struggle in another, recover after rest, or become overwhelmed during periods of sustained load. These shifts do not necessarily indicate changes in personality or motivation. They reflect changes in the conditions from which behaviour emerges.

This perspective helps explain why behavioural interpretation so often goes astray. Observers frequently assume that stable people behave consistently regardless of circumstance. When behaviour changes, the individual is described as inconsistent, unreliable, or emotionally unstable. Yet this expectation overlooks the fact that biological systems are inherently responsive to changing internal and external conditions.

Within the Signals™ framework, behavioural variability is not treated as a problem requiring explanation. It is treated as information.

Changes in behaviour indicate that something within the system has changed. State may have shifted. Load may have increased. Capacity may have decreased. Behavioural variation therefore becomes a signal directing attention toward changing conditions rather than toward assumptions about identity.

Understanding variability in this way does not imply that every behavioural change is healthy, adaptive, or desirable. Rather, it recognizes that behaviour is often the observable consequence of changing system conditions before it is evidence of stable personal characteristics.

Viewed through this framework, inconsistency becomes less mysterious. Behaviour remains entirely consistent with the conditions from which it emerged.

8. Reinterpreting Behaviour

The way behaviour is interpreted shapes the way people respond to it.

When behaviour is understood primarily as evidence of personality or character, intervention naturally focuses on changing the individual. A person who withdraws is encouraged to become more engaged. Someone who appears overwhelmed is told to become more resilient. An employee who struggles under increasing demand is advised to improve their time management. The underlying assumption is that behaviour reflects a stable quality within the person.

The Signals™ framework proposes a different starting point.

If behaviour is understood as the observable output of a dynamic system, then interpretation begins by examining the conditions from which that behaviour emerged. Rather than asking what behaviour reveals about identity, the framework asks what changes in state, load, or capacity might reasonably explain what is being observed.

This shift does not eliminate personal responsibility, nor does it deny that behaviour has consequences. Instead, it changes the order of interpretation. Conditions are considered before conclusions about character are drawn.

The difference may appear subtle, but it fundamentally alters behavioural understanding.

A person who withdraws is no longer assumed to be inherently avoidant. Withdrawal may instead indicate that current demands exceed available capacity.

A person who appears emotionally reactive is not immediately understood as unstable. Heightened reactivity may reflect an elevated physiological state interacting with sustained load.

A person whose performance varies across situations is not necessarily inconsistent. Their behaviour may simply be changing in response to changing system conditions.

In each case, the behaviour itself remains unchanged. What changes is the interpretation.

The goal of the Signals™ framework is not to replace one set of labels with another. Rather, it encourages a more accurate process of behavioural interpretation by directing attention toward the conditions that shape behaviour before assigning enduring conclusions about the individual.

Examples of this shift are summarized below.

Traditional Interpretation	Signals™ Interpretation
Avoidant	Current demands exceed available capacity.
Inconsistent	Behaviour is varying as conditions change.
Overreactive	Behaviour reflects an elevated physiological state interacting with current load.
Disengaged	Behaviour may indicate reduced capacity, protective withdrawal, or sustained overload.

These examples are not intended as diagnostic substitutions. They illustrate how the same observable behaviour can be interpreted through a systems framework rather than an identity-based one, leading to questions that are often more accurate, more compassionate, and more useful.

9. Relationship to Existing Research

Signals™ is not proposed as a replacement for existing psychological, neuroscientific, or behavioural models. Rather, it functions as an interpretive framework that integrates established

findings from multiple disciplines into a single conditions-based approach to understanding behaviour.

Its contribution is therefore organizational rather than biological. The framework does not propose a new mechanism for human behaviour. Instead, it brings together well-established principles that are often studied separately and applies them within a unified model of behavioural interpretation.

Research in stress physiology has consistently demonstrated that physiological activation influences attention, emotional regulation, executive functioning, and decision-making (McEwen, 1998; Starcke & Brand, 2012). As stress increases, behavioural flexibility frequently decreases, even though underlying ability may remain unchanged.

Cognitive Load Theory similarly demonstrates that performance declines as demands exceed the processing resources available within working memory (Sweller, 1988). Behaviour that appears inattentive, disorganized, or inconsistent may therefore reflect increasing cognitive demand rather than reduced motivation or intelligence.

Research on executive functioning further demonstrates that planning, inhibition, working memory, attentional control, and behavioural regulation depend upon cognitive resources that fluctuate across changing physiological and environmental conditions (Diamond, 2013). Executive functioning is therefore best understood as dynamically available rather than permanently possessed.

Predictive processing offers an additional perspective by proposing that perception and behaviour are continuously shaped by prior experience, current context, and the brain's ongoing attempts to anticipate what will happen next (Clark, 2016). Behaviour is therefore influenced not only by present circumstances but also by how the nervous system predicts and prepares for them.

Similarly, the theory of allostasis describes the body's continuous regulation of physiological resources in anticipation of future demands rather than simple responses to present conditions (Sterling, 2012). Behaviour, from this perspective, reflects an adaptive system constantly balancing available resources against expected demand.

Signals™ does not seek to reinterpret these established findings. Instead, it provides a practical framework through which they can be understood together. State, load, and capacity become organizing variables that allow diverse bodies of research to inform a common interpretation of behavioural output.

The framework therefore asks a different question than many traditional approaches. Rather than beginning with assumptions about personality, motivation, or pathology, it begins by examining the conditions under which behaviour emerged. Behaviour becomes the observable signal of a dynamic biological system responding to those conditions.

10. From Behavioural Correction to Conditions-Based Understanding

How behaviour is interpreted inevitably shapes how people respond to it.

If behaviour is understood primarily as a reflection of personality, intervention naturally focuses on changing the individual. Greater effort, stronger discipline, increased motivation, or improved self-control become the primary goals because the behaviour is assumed to originate within the person.

A conditions-based interpretation begins elsewhere.

Rather than asking how behaviour can be corrected, it first asks what conditions may be influencing the behaviour that is being observed. This does not eliminate personal responsibility, nor does it suggest that harmful behaviour should be ignored. Instead, it recognizes that effective

intervention depends upon accurately understanding the processes producing the behaviour in the first place.

Within the Signals™ framework, behaviour is not treated as the problem itself. It is treated as evidence.

Signals invite investigation rather than immediate judgement. A change in behaviour suggests that something within the system has changed. Physiological state may have shifted. Load may have accumulated. Capacity may have been reduced. Behaviour therefore becomes the starting point for inquiry rather than the endpoint of explanation.

This distinction has practical implications across many domains.

In education, behavioural change may prompt questions about cognitive load, emotional safety, sleep, or environmental demand before conclusions are drawn about motivation or discipline.

In healthcare, fluctuating behaviour may be interpreted alongside changing physiological and psychological conditions rather than as evidence of non-compliance or lack of commitment.

Within organizations, declining performance may signal increasing cumulative load, insufficient recovery, or reduced capacity rather than diminished work ethic alone.

In families and personal relationships, behavioural changes may encourage curiosity about current conditions before assumptions are made about character or intention.

Across each of these settings, the observable behaviour remains the same. What changes is the process of interpretation.

The Signals™ framework therefore shifts the primary question from:

"What is wrong with this person?"

to:

"What conditions are producing what I am observing?"

This change in perspective does not guarantee better decisions. It does, however, encourage decisions that are more closely aligned with the evidence available. Behaviour is no longer treated as a verdict on identity, but as information about the current functioning of a dynamic biological system.

For this reason, conditions-based interpretation is not an alternative to accountability. It is a prerequisite for accurate accountability. Understanding behaviour more precisely allows interventions to address the conditions contributing to the behaviour rather than responding only to its visible expression.

11. Conclusion

Human behaviour has long been interpreted as evidence of personality, character, motivation, or intention. While these interpretations often feel intuitive, they frequently extend beyond what behaviour alone can establish. Observable actions provide information about how a person is functioning under particular conditions, but they do not, by themselves, reveal who that person is.

The Signals™ framework proposes a different starting point.

Rather than treating behaviour as identity, it understands behaviour as the observable output of a dynamic biological system responding to changing internal and external conditions. State, load, and capacity interact continuously to influence how behaviour is expressed. As those conditions change, behaviour changes. Variability therefore becomes an expected property of adaptive systems rather than evidence of inconsistency or personal deficiency.

This perspective does not reject existing psychological or neuroscientific knowledge. It brings together established findings into a practical framework for interpreting behaviour more

accurately. In doing so, it shifts attention from fixed conclusions about people toward the conditions that shape how they are functioning in a given moment.

Importantly, interpreting behaviour through conditions is not an argument against accountability. Responsibility remains essential. Behaviour still has consequences, relationships still require repair, and individuals remain responsible for the choices available to them. What changes is not the existence of accountability, but the accuracy with which behaviour is understood before conclusions are drawn.

Signals™ ultimately proposes a shift in interpretation rather than a new theory of human nature. Behaviour is approached not as a verdict on identity but as information about the current state of a living system. The signal does not explain everything, but it often explains more than we first assume.

If behaviour is interpreted without attention to the conditions from which it emerged, important information is lost. When those conditions are considered alongside what can be observed, interpretation becomes more complete, more precise, and more consistent with what is already understood about human functioning.

The question, then, is not simply:

Who is this person?

The more informative question is:

What conditions are producing the behaviour I am observing?

That question does not remove judgement.

It improves it.

And in doing so, it offers a more accurate foundation for understanding human behaviour.