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## Logical Connection Argument from the Perspective of Exploratory Behaviors

### Abstract

In the most general terms, the Logical Connection Argument (LCA) states that theory and practice are two inseparable aspects of the same thing. Every action (or practice), linguistic or otherwise, is an indivisible unity of content and the means by which it is expressed. Alternatively, we may talk of the inseparability of content and form, meaning and act of expression, goal and method or means of its realization, and so forth. The argument was meant to prove that intentions cannot be treated as causes in social scientific explanation, but it did it at the cost of making any meta-analysis, and hence, critique, highly problematic. My position is that the LCA is indeed logical, and hence irrefutable. Nonetheless, we can distinguish between “raw” and “refined” versions of the argument. The refined version maintains that while ultimately and ideally, the content and means of expression presuppose one another in the sense that a content is inconceivable without a form, and vice versa, in reality there is never a perfect match between aims and methods. In typical circumstances, we do not have a precise sense of what we are doing; the meaning of our actions is gradually discovered in the course of exploratory behaviors, of which (immanent) critique is an indispensable part. In this contribution, I venture to examine the problem from a neuropsychological perspective with the view to showing in exactly what sense and to what extent explorative behaviors and associated motivations preside over other activities. I argue that content is always underdetermined with respect to its form (and vice versa), and hence the alleged internal connection between them is not a given, but rather amounts to a regulative principle which motivates mutual adjustments.

### Key words:

Logical Connection Argument, meaning, content, means of expression, goal-directed action, performativity

## The Logical Connection Argument: Its Incarnations and Philosophical Ramifications

The Logical Connection Argument (henceforth: LCA) first emerged in the debate between naturalists (empiricists) and neo-Wittgensteinians. The question was: can intentions and reasons be treated as causes in social-scientific explanations?<sup>1</sup> According to the LCA, this is impossible, since intentions (explanans) are logically inseparable from the actions which they motivate and hence must be contained in the description of the action to be explained (explanandum). More generally, the argument establishes inseparability of content and form, of meaning and means of expression, of goals and the means of their realization (or associated action blueprints), and so forth. In an apt rendering of Karl-Otto Apel, it posits that “the relation between the meaning of a goal intention, the meaning of the situation assessment, and the meaning of the action to be explained is an internal, conceptual-analytic, even logical relation.”<sup>2</sup>

Regardless of formulation, the argument entails that a change in one action component changes its very nature, and thereby either makes the action meaningless, or marks a transition from one mode or type of activity or behavior to another. What also follows from it is that the meaning of a linguistic act cannot be grasped and validated from a third-person – an “ideal observer’s” – perspective, for such a cognitive distancing would inevitably distort it. The argument thus eliminates the problem generated by Cartesian dualism, that is, the problem of how the subject is able to get hold of the object assuming that the latter is by definition external to it, or even ontologically different from it – by making the object immanent to the performance. That, however, is achieved at the cost of making criticism – and any meta-analysis, for that matter – highly problematic.

As just indicated, the LCA comes in different forms (linguistic or otherwise), and depending on a specific formulation, picks out different units of meaning (linguistic expressions, speech acts, goal-oriented actions, and social practices). The most primordial form of the argument is to be found in Wittgenstein’s *Tractatus*, in which he maintains that we cannot grasp a linguistic content outside of the act (logical form) by which it is expressed. According to Wittgenstein, to try to capture a content independently of its (logical) form would be like trying to see the perceiving eye.<sup>3</sup> Hence, linguistic contents are only “presentable.” The main motivation behind this argument was to show that any attempt to divorce content from its linguistic expression is tantamount to positing the existence of a metaphysical entity – the world “out there” – and hence to falling back on Cartesian dualism.

The LCA also underlies the conception of language-games as “presented” in *Philosophical Investigations*. The difference is that now we have to deal with a multiplicity of language-games, or practices, each delineating its own rules of performance. In language-game theory, logical connection obtains between meaning or content and the respective, socially sanctioned mode of conduct. Neo-Wittgensteinian forms of the LCA, in turn, propose that there are two paradigmatic types of linguistic actions, that of understanding and that of explanation.<sup>4</sup> This is the form of the LCA that has taken root in the philosophy of social sciences.<sup>5</sup>

In *The Structure of Scientific Revolutions*<sup>6</sup> Thomas Kuhn also implicitly – and under the influence of the neo-Wittgensteinian Norwood Hanson – relied on the LCA, adding to it a perceptual component. According

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1) Charles Landesmann, “The New Dualism in the Philosophy of Mind,” *Review of Metaphysics* 19, no. 2 (December 1965): 329–45.

2) Karl-Otto Apel, *Understanding and Explanation*, trans. Georgia Warnke (Cambridge, MA: London: The MIT Press, 1984): 71.

3) Ludwig Wittgenstein, *Tractatus Logico-Philosophicus*, trans. C.K. Ogden (New York: Harcourt, Brace, and Company, 1922): 5.633.

4) Georg H. Von Wright, *Explanation and Understanding* (Ithaca, NY: Cornell University Press, 1971); cf. Apel, *Understanding and Explanation*.

5) Peter Winch, *The Idea of a Social Science and Its Relation to Philosophy* (London: Routledge & Kegan Paul, 1958).

6) Thomas S. Kuhn, *The Structure of Scientific Revolutions* (Chicago: University of Chicago Press, 1996).

to Kuhn, the scientist's understanding of the laws of physics is entirely encapsulated in the way he or she uses it in puzzle solving. The application of these laws is strictly tied to how the scientist perceives the world (Chapter 10).

A form of the LCA is tacitly present in social constructivism (Bruno Latour, Steven Woolgar, and Michel Callon), which proposes that the subject (or actor as the cited authors prefer to call it) and object of scientific inquiry are coupled together to form a system of interactions; there is no scientific content outside the system. Judith Butler's conception of performative social practices,<sup>7</sup> as well as Pierre Bourdieu's concept of habitus, are yet other cases in point.<sup>8</sup>

The LCA is also widespread in psychology and neuroscience. In Carl Jung's model, for example, archetypes (or, more precisely, archetypal images) and instincts are two sides of the same thing. Every instinct is associated with a certain (archetypal) image, a mode of action by which it realizes its goals, and perceptual schemas of stimuli that have the power to trigger it.<sup>9</sup> Michael Tomasello, in turn, defines intention as a unity of the desired state of affairs and method by which the former is brought about.<sup>10</sup> Jeffrey Gray and Neil McNaughton, in their work on anxiety, which will be reviewed below, also define a goal as a combination of object or desired end and the method of its attainment.<sup>11</sup>

More generally speaking, the LCA is a hallmark of the performative turn in philosophy, and is aimed at repudiating the (Cartesian) model of the "monological subject",<sup>12</sup> according to which the subject cognizes based on pre-existent rules and acts based of pre-defined goals. In doing so, however, the LCA generates serious problems on its own. These problems have been neatly expressed by Karl-Otto Apel in his critique of Wittgenstein.<sup>13</sup>

Apel reveals the irremovable tensions (performative contradictions) inherent in the language-game concept itself.<sup>14</sup> As he points out, language-game theory is paradoxical when it comes to the relationship between first and second level discourses (meta-analysis). To say that language-game is a transcendental concept – something that makes every discursive engagement possible, and as such, constitutes a universal horizon of meaning – is to tacitly assume that the multiplicity of language-games conceals something universal, something that all games share.<sup>15</sup> This, however, is at odds with the notion to the effect that the very condition of the possibility for game-playing is located inside every single game, and therefore cannot be thematized in an ordinary way. So long as one can meaningfully talk about the conditions of possibility for meaning (by way of a second-order language-game), these conditions must somehow be amenable to analysis. In a word, language-game theory generates the problem of self-reference, that is, the problem of how to meaningfully discuss linguistically-mediated practices. A dilemma thus arises: either we assume that the second-order discourse thematizes the first-order discourse, in which case we would have to concede the possibility of a language-game that has a different status

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7) Judith Butler, *Gender Trouble: Feminism and the Subversion of Identity* (New York: Routledge, 2007).

8) Pierre Bourdieu, *Practical Reason: On the Theory of Action*, trans. Randall Johnson (Stanford: Stanford University Press, 1998).

9) Carl Jung, *Archetypes and the Collective Unconscious*, ed. Herbert Read, Michael Fordham, and Gerhard Adler, trans. F.R.C. Hull (London: Routledge, 1968), 78; Tom Laughlin, *Jungian Theory and Therapy*, vol. 2 (Los Angeles: Panarion Press, 1982), 15, 59.

10) Michael Tomasello et al., "Understanding and Sharing Intentions: The Origins of Cultural Cognition," *Behavioral and Brain Sciences* 28, no. 5 (October 2005): 675–735, <https://doi.org/10.1017/S0140525X05000129>.

11) Jeffrey Gray and Neil McNaughton, *The Neuropsychology of Anxiety: An Enquiry into the Function of the Septo-Hippocampal System* (Oxford: Oxford University Press, 2000): 23.

12) Jürgen Habermas, *The Theory of Communicative Action*, trans. Thomas McCarthy, vol. 1 (Boston: Beacon Press).

13) Karl-Otto Apel, *Towards a Transformation of Philosophy*, ed. Glyn Adey and David Fisbey (Milwaukee, WI: Marquette University Press, 1998), 1–45.

14) *Ibid.*, 8.

15) *Ibid.*

from all other language-games, or we eliminate the possibility of putting the game-bound performances under scrutiny and refining them. By undermining the possibility of meta-reference, we make the LCA meaningless, and call the possibility of the social sciences into question.<sup>16</sup>

Relatedly, it is unclear on language-game theory what allows the performer to regulate his or her performance in such a way to enable him or her to realize the embedded intentions.<sup>17</sup> If we cannot determine what constitutes a paradigm case of language-games, language-games can easily turn into trivial “word games,” with no content and relevance whatsoever.<sup>18</sup> Put another way, if goals and methods cannot be rendered independently of one another, there is a risk that every performance can become a goal in itself that it will succumb to self-defining “utility functions.” This makes it impossible to tell a difference between a meaningful performance and a systematic, but devoid of meaning, sequence of acts (regularism).<sup>19</sup>

In a word, language-game theory implies a conflict between “givenness” and cognitive distancing, the latter being what makes mutual critique and deliberation possible. It is this apparent conflict that is the main topic of this paper.

My position is that though the LCA is essentially irrefutable, we can nonetheless distinguish between “raw” and “refined” versions of it. The refined version maintains that while ultimately and ideally – or analytically<sup>20</sup> – the content and means of expression presuppose one another in the sense that content is inconceivable without a form, and vice versa, in reality there is never a perfect match between aims and methods.<sup>21</sup> In typical circumstances, we do not have a precise sense of what we are doing; the meaning of our actions is based in an initial, crude preunderstanding that is being gradually clarified in the course of exploratory behaviors, of which critique is an indispensable part. In other words, content is always underdetermined with respect to its form (and vice versa), and hence the alleged internal connection between them is not a given, but rather amounts to a regulative principle which motivates mutual adjustments.

In essence, my solution to the problem stemming from the LCA follows the lines of Apel’s critique.<sup>22</sup> In this particular contribution, however, I venture to examine the problem from a neuropsychological perspective, concentrating on the internal connection between goals and means as it manifests itself in the course of exploratory behaviors. My aim is to show that as long as it contains explorative components, every action involves a twofold orientation: toward the object and toward the performance and performer themselves. Exploratory behaviors are at once built upon habitual responses and transcend them, whereby they create a space in which the goal-means relationships can be negotiated, leading to ever better performance and understanding. These assumptions do not undermine the logic of the LCA, but they do, I believe, go some way toward eliminating the most acute problems that have come to be associated with it, thus making it amenable to productive use.

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16) Ibid., 29–30, 200.

17) Ibid., 8. Apel discusses this problem in reference to belief-sentences.

18) For Apel’s critique of the neo-Wittgensteinian distinction between explanatory and hermeneutic language games, see Apel, *Understanding and Explanation*.

19) Robert B. Brandom, *Making It Explicit: Reasoning, Representing, and Discursive Commitment* (Cambridge, MA: Harvard University Press, 1994).

20) Donald Davidson, “Actions, Reasons, and Causes,” *Journal of Philosophy* 60, no. 23 (November 1963): 685–700.

21) Cf. Larry Laudan, *Science and Values: The Aims of Science and Their Role in Scientific Debates* (Berkeley: University of California Press, 1984). Laudan’s aim was to overcome the “covariance fallacy”, in virtue of which the chief ingredients of a given scientific practice (paradigm) – theory, axiology and methodology – form an inseparable cluster (Ibid., 43–50). Since, however, on his model, these three ingredients effectively co-vary – an alteration in one of the components necessitates an adjustment in the remaining two – it is not in fact immune to the LCA.

22) See: Apel, *Toward a Transformation of Philosophy*; Apel, *Understanding and Explanation*.

## Motivations and Philosophical Models of Action

Exploratory behaviors, and associated motivations, hardly ever become subjected to philosophical analysis. Michael Polanyi's investigations being a notable exception to the rule.<sup>23</sup> My aim in this section is to provide a rudimentary characterization of exploratory behaviors and attitudes, and against this background, to show some correspondences between three different types of motivations and philosophical models of action.

As Polanyi points out, every action (pursuit) is a form of exploration and discovery, where exploration might be more rewarding than the actual "reward." This observation has now been confirmed repeatedly, on both ethological and neurobiological levels, giving rise to a distinction between appetitive and consummatory behaviors. Studies show, for instance, that the neural circuits responsible for these kinds of behavior are mutually suppressive.<sup>24</sup> Exploration (e.g. foraging) is mediated by dopaminergic pathways and typically increases arousal, whereas consummation (e.g. food consumption) reduces it, causing a brief sense of relief. Therefore, the pleasure associated with consumption must be differentiated from the pleasure stemming from exploration, the latter having to do with anticipation of a reward rather than the reward itself.<sup>25</sup> In Jaak Panksepp's words:

These circuits appear (*responsible for explorative behaviors, i.e., the SEEKING systems – the author*) to be major contributors to our feelings of engagement and excitement as we seek the material resources needed for bodily survival, and also when we pursue the cognitive interests that bring positive existential meanings into our lives.<sup>26</sup>

The emotional states associated with the activation of the reward system (or SEEKING systems, as Panksepp prefers to call these) energize us in the search for things and events critical with respect to our survival and well-being, and as such they underlie the sense of meaning and the sense of direction. This it to say that the mere contentment coming from satisfaction of our needs is far from being able to confer meaning on our actions.

The SEEKING systems promote playfulness. For example, upon mastering the trick of using a lever to get food, a rat tends to press the lever just for the sheer pleasure of it:

If one presents the animal with a manipulandum, a lever that controls the onset of brain stimulation, it will readily learn to press the lever and will eagerly continue to "self-stimulate" for extended periods, until physical exhaustion and collapse set in. The outward behavior of the animal commonly appears as if it is trying to get something behind the lever.<sup>27</sup>

It seems that once the animal – a rat, chimpanzee, or human – recognizes that certain activity leads to some kind of reward, it will typically remain motivated to repeat it in the hope of obtaining something else that might also be of use or interest. That is to say, animals develop a sense of the hidden possibilities around them, and learn by following these hints.

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23) Michael Polanyi, *Personal Knowledge: Towards Post-Critical Philosophy* (London: Routledge, 1962).

24) Jaak Panksepp, *Affective Neuroscience: The Foundations of Human and Animal Emotions* (Oxford: Oxford University Press, 1998).

25) *Ibid.*, 81.

26) *Ibid.*, 144.

27) *Ibid.*, 145.



Developmentally, the explorative attitude is a hallmark of the sensorimotor phase of development in a Piagetian sense, and is associated with something we may call incompleteness of perception.<sup>28</sup> At this stage, children typically begin to understand that there is more to an object than they can see, which provokes exploratory behaviors aimed at uncovering the concealed content. The thing is that according to the authors just cited, for our actions to be meaningful this state of curiosity and playfulness must continue far beyond childhood. Generally speaking, it is the tacit dimension of perception that drives learning and development in children and adults alike. According to Polanyi, perception has *from-to* structure,<sup>29</sup> which is to say that it involves striving to reach beyond appearances. In a word, even the most ordinary perception involves an inchoate tendency to push the boundaries of existing frameworks or paradigms.

Whenever an explorative attitude fails to preside over a performance, we either fall back on compulsion (mindless repetition of acts that once proved successful, with gradually diminishing returns), or we succumb to habits. In either case, our ability to sustain the activity diminishes with time, but for different reasons.

Overactivity in the reward system is commonly associated with psychosis and all forms of addiction. Addiction is a form of excessive self-stimulation, where the larger goal almost loses its relevance and no longer has any control over behavior; all that matters is getting more of what one already has. In general, overactivity of the system produces “confirmation bias”, a tendency to attend to those events that support our hypotheses and convictions (are immediately rewarding).<sup>30</sup> Underactivity of the system, in turn, underlies depression. When one’s action either fails to bring what is desired, or is not animated by anticipation (or hope), one will, sooner or later, lose a sense of direction as a result of which one’s conduct will become disorganized and more deliberate effort will be needed to push through. One way or another, the absence of the exploratory attitude leads to a depletion of resources.

We are now in a position to try to establish some correspondences between three motivations and philosophical models of action in the hopes that this kind of coarse-grain and intentionally exaggerated analysis will aid in dismantling the raw version of the LCA.

As far as the monological subject is concerned, the subjugation of the object seems to be the primary motivation. The monological subject wants to make things happen in the world around him; the subject is consumed by the desire to achieve an immediate goal or complete a well-defined task. More precisely, he or she is preoccupied by some explicit and often idiosyncratic and rigid idea of what counts as the desired end result (reward). The monological subject uses instrumental reason to choose whatever method brings one closer to a goal, regardless of possible long-term costs (consequences).

As regards language-game theory, the task of establishing the possible motivations behind game-playing is a bit more challenging. The emphasis on paradigms suggests, however, that the player finds fulfillment in the very performance, and hence that the leading motivation is to do with being “in the flow” of events. Simply put, the player draws satisfaction from uninterrupted, habitual responses (or routines), from being able to move smoothly from one act to the next according to some implicit trajectory whose thematization could cause disruption.

In contrast to both of these, exploratory behaviors are motivated by the prospect of learning and the possibility of improving performance. Importantly, exploration is not a mindless groping. As will be shown in more detail below, exploration is only possible within the bounds of an aim that the agent must to some degree

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28) Cf. Steven Crowell, *Normativity and Phenomenology in Husserl and Heidegger* (Cambridge: Cambridge University Press, 2013). Polanyi speaks of the incompleteness of the symbol (Polanyi, *Personal Knowledge*, 28).

29) Michael Polanyi, *The Tacit Dimension* (New York: Doubleday & Company, 1966).

30) Jeffrey Gray, “A General Model of the Limbic System and Basal Ganglia: Applications to Schizophrenia and Compulsive Behavior of the Obsessive Type,” *Revue Neurologique* 150 (August-September 1994): 605–613.

be able to grasp or to anticipate. In other words, the exploratory attitude involves the ability to define a goal in a relative independence from the means by which it can be achieved. If the goal were fully encapsulated in a performance, there would simply be nothing left to explore.

By virtue of the fact of exploratory behaviors, being as they are associated with an anticipatory attitude, transcend every “here-and-now,” they complicate the problem of the relationship between form and content. The essence of exploratory behaviors resides in the fact that the understanding of goals and means, as well as the relationship between these, is negotiable. Means and goals are underdetermined with respect to each other: while the same goal can be realized by different means and the same means can serve different purposes, not all combinations of means and goals are equally viable. We may say that our initial understanding of the meaning of a given performance, which allows us to embark on it, is associated with the ability to tacitly delineate a space of possibilities as regards goal-means relationships, rather than to pinpoint one single such relation.

Since the purpose of exploration cannot be encapsulated in any single paradigm, there is also no sense of what counts as a completion of a pursuit; exploration is essentially open-ended. In a word, it attaches to those kinds of behaviors that improve over time without losing either reference or “aboutness.”

In animals, exploratory behaviors transpire whenever a natural flow of events is interrupted, alerting the animal to a possible threat or novelty, which, under certain conditions (see below) motivates it to find hidden clues or develop new skills. Exploration in this case is limited to specific types of biologically predetermined situations (mating, foraging, etc.). In humans, in turn, the scope of exploration is much wider. Exploratory attitudes manifest themselves most fully at the level of something we may refer to as life-projects that depend on both biology and culture. For example, exploration plays a critical part in one’s being a musician or researcher. In these cases, one operates from some basic understanding of him or herself as a musician or researcher, and then, in the course of performing one’s acts, one learns something new at once about the subject-matter and oneself as a performer.

Importantly, there is nothing essentially wrong with consummatory and habitual behaviors. In fact, there is a co-dependence between all three types of behavior. For instance, a musician or a lecturer must be able to give herself to a performance. He or she must also be able to actually complete certain tasks – write a thesis, win an award – which punctuates his or her development by providing him or her with something to build on, the means necessary to practice and further develop her trade (e.g. recognition, promotion, and remuneration). The thing is that consummatory and habitual behaviors are unsustainable unless exploratory attitude presides over them. Simply put, exploratory behaviors fill in the gap present in the other two models of action.<sup>31</sup> As far as the monological subject is concerned, the exploratory attitude explains why we do not simply give up our goals when faced with obstacles and why we are actually able to overcome them. It also goes some way toward explaining how the subject is even able to come up with an initial hypothesis as to the desired trajectory of action to undertake in pursuit of his or her goals. As regards game-playing, exploratory attitudes explain why we are willing to take another step in the sequence in the first place, as well as to resume the activity upon interruption.

### Behavioral Inhibition System and Immanent Critique

Now that a basic characterization of exploratory attitudes has been provided, we may delve a bit deeper into this phenomenon and establish how exactly the possibility of critique is embedded in it. In this and the following sections my aim is to substantiate the thesis that every pursuit hinges on a twofold orientation: toward the object or the subject-matter, and toward the subject and the performance themselves.

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31) In fact, an investigative attitude is a form of habit – a habit to constantly challenge and test oneself. It is just that this is a higher-order habit with respect to these underlying specific performances (routines).

As Gray and McNaughton has shown, a successful pursuit does not rely solely on the anticipation of rewards, but also upon an anticipation of threats.<sup>32</sup> In a word, effective pursuit is based in an equal extent on pleasure and anxiety (this is, after all, what differentiates between consummatory and appetitive behaviors). In other words, the pursuit of rewards (behavioral approach system, BAS) must be offset by critical monitoring of actions undertaken and their results, this being the job of behavioral inhibition system (BIS), located in a region to which Gray and McNaughton refer to as the septo-hippocampal system.

Gray and McNaughton distinguish two types of anxiety: one pathological, which is caused by overactivity of BIS and results from excessive negative tagging of certain stimuli, and one adaptive, which helps alert the pursuer to a threat or novelty with the view to eliciting exploratory behaviors. In other words, the main function of BIS is not, strictly speaking, to interrupt the performance altogether, but to enhance it by allowing critique and inquiry to mediate goal-pursuit.

More specifically, the theory alleges that normal-range behavior oscillates between overstimulation and withdrawal. Fear is a set of emotional and physiological reactions allowing the animal to leave a threatening situation and thereby to avoid an encounter with danger. In contrast to this, (adaptive) anxiety, mediated by BIS, is an affective-behavioral mechanism whose role is to sustain the approach *despite* the presence of aversive stimuli: “This system is held to control the inhibition of ongoing behavior, the increase in vigilance, and the increase in arousal, which can be associated with stimuli associated with pain, punishment, failure, loss of reward, novelty, or uncertainty.”<sup>33</sup>

The model implies that effective conduct hinges on self-regulation that involves the ability to scrutinize both what happens outside (challenges) and inside (the definition of the situation and the means for dealing with it) the pursuer during the very pursuit. Both fear and pathological anxiety prevent this from happening.

This account of exploratory behaviors is predicated on a commonsensical observation that whatever goals the animal sets itself, their attainment requires that certain coordinated action be undertaken. Even the most critical goals, like food, do not simply materialize before an individual.<sup>34</sup> What this means is that normally the relation between current and desired states of affairs will be mediated by a whole chain of secondary reinforcers, whose length depends on the complexity of the task at hand (the so called goal-gradient) and the cognitive system itself.<sup>35</sup> Some of these reinforcers will be positive (response producing), while others will be negative (response inhibiting). In this way, the pursuit of each goal gets hypothetically parsed into an ordered set of sub-goals, “hypothetically” being a keyword.

In other words, the difference between pathological and normal-range anxiety may also be conceptualized in terms of “defensive distance” – a spatial or temporal distance from the source of danger. The rule of thumb is that for anxiety to be a more appropriate physiological and psychological response than fear, defensive distance must be long enough to allow an animal to “deliberate” over how to avoid danger without abandoning a goal.

The more steps we can break the pursuit into, the better position we are in to anticipate the source of threat and deal with it without giving up the goal. Increasing defensive distance through careful ordering and sequencing of actions may thus be one of the ways to make exploration successful in the long-run. Critically, this ordering is always tentative and hypothetical; adaptive responses require the ability to reorder every sequence based on the ever better grasp of the situation and one’s place in it.

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32) Gray and McNaughton, *The Neuropsychology of Anxiety*.

33) *Ibid.*, 4.

34) Gray, “A General Model of the Limbic System and Basal Ganglia.”

35) Gray and McNaughton, *The Neuropsychology of Anxiety*, 5.



In a word, the concept of defensive distance entails that depending on the complexity of the cognitive system, the pursuer can assume different standpoints with respect to the object or problem at hand without losing connection with the situation in which it appeared (i.e., without turning a concrete problem into an abstract one).

The behavioral inhibition system hence introduces the necessary balance between approach and avoidance, and thereby provides regulatory mechanisms that keep the animal on task and prevent it from, on the one hand, yielding to premature abandoning of goals, and on the other, entering into self-reinforcing loops.

Ultimately, the role of BIS is to compare the existing state of affairs with the desired one. Upon that comparison, a match-mismatch decision is made. This sort of goal monitoring takes place all the time; we are not aware of it because typically no serious mismatch is detected and the system works in “just-checking” mode. If, however, the decision is negative, BIS enters into “control mode” as a result of which the current routine gets interrupted.

The fact that if BIS works correctly, the pursuit is merely suspended upon interruption, is crucial here. The animal does not abandon the goal, but instead engages in a vigilant observation of the immediate environment or in active risk assessment, so that it can adjust its behavior to the prevailing conditions. It does this by gathering further information from the environment and perusing memory stores in search of alternative descriptions of the world and his or her own position in it, including the pursuer’s possible contribution to the sudden emergence of a threat.

All in all, a properly functioning behavioral inhibition increases perceptual acuity and thereby enables effective goal monitoring. In the process, the implicit resources and presumptions are being made explicit. As pointed out already, this kind of scanning and risk assessment prefigures deliberation.

Thus, BIS provides a link between learning and goal-directedness. In providing a corrective mechanism with respect to pre-established, end-means relationships, it also underlies perseverance and commitment. BIS makes it possible for an agent – be it an animal or human – to learn new ways of attaining goals *in the very process* of goal-attainment. The subject is granted a certain amount of freedom to “move around” an object with the view to uncovering the potential dwelling in both situations that transpire and existing patterns of behavior, without transgressing against meaning and purpose.

An increasing complexity of goal-gradients is tantamount to a growing mediation between means and goals and thus to the possibility of refinement of behavioral patterns, which is consistent with the refined version of the LCA as proposed above. This suggests that the necessary behavioral adjustments can in fact be so profound that the very understanding of a goal may change as a result of this kind of a learning process.

## Goal-Monitoring and Behavior-Adjustment

One more facet of the structure and function of behavioral systems is worthy of brief analysis. One might be interested in the kind of factors taken into account in the formation of anticipations to be compared with prevailing states of affairs. This may help us better understand the nature of the “deliberation” involved in exploration.

As we have said, BIS compares what is happening with what is supposed to be happening. In order for this comparison to be possible, the system must be able to predict future state of affairs based on what is going on now. We may summarize the prediction process<sup>36</sup> to comprise the following components:

(1) The last verified state of the world.

(2) Known regularities, stored in both episodic and procedural memory, including:

a) Stimulus-stimulus relationships: in making predictions, an agent must fall back on the available knowledge about correlations between phenomena. This knowledge is acquired through a form of classical

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36) Gray and McNaughton, *The Neuropsychology of Anxiety*, 18–22.

conditioning; note, however, that in more complex organisms conditioning typically results in a large part from a guided, focused observation, and hence is not entirely passive.<sup>37</sup>

b) Stimulus-response contingencies – depending on individual learning histories and predispositions, each person will develop specific behavioral habits. Stimulus-response relationships are contingent in that instrumental conditioning in which dispositions are formed are not fully controllable by the experimenter.<sup>38</sup> On top of that, they are flexible and adaptive, leaving room for the individual to produce new responses whenever punishment or non-reward is expected to occur.<sup>39</sup>

c) Response-stimulus relationships, which constitute the proper basis for instrumental interventions. These relationships are also individualized and contingent upon skill-learning.

d) Response-response relationships, which refer to established sequences of responses forming actions.

What draws attention is that the predictive process is clearly self-centered – predictions are constrained by the agent's understanding of the situation he or she is in, his or her skills and capacities, as well as his or her goals and intentions. The model under review implies that goal pursuit is organized in sequences of sub-goals, where each step is a cycle of response and assessment thereof.<sup>40</sup> What is being assessed is the extent to which each step brings a performer closer to the goal, not just with how well each step fits some predetermined external standard, which of course forces the agent to make at least some aspects of his definition of the problem explicit.

In other words, negative feedback impacts both one's vision of the world around him or her and his or her self-understanding. Already at this basic level, it proves impossible to reduce a goal pursuit to a learned routine: every step is an opportunity to make adjustments in the existing response patterns, or more precisely, in stimulus-response relationships, for the new response does not have to be new in absolute terms, but only relative to the situation and goal at hand.

So far we have discussed only the most rudimentary mechanisms for self-regulation in goal-pursuit – those subservient to dopaminergic pathways in the basal ganglia and the septo-hippocampal system that Gray and McNaughton postulate to be the seat of mechanisms responsible for behavioral inhibition – and did not say anything about the neocortical contribution to the process. There is no room here to address the problem in any detail. Suffice it to say that it appears that these higher levels of processing – supervised by the prefrontal cortex – mainly add refinement to the functions of the subcortical systems.<sup>41</sup> Neuroscientific research, for example, demonstrates the existence of closed frontal-basal ganglia-cerebellar loops that make long-term regulation and cognitive control of behavior possible.<sup>42</sup> The prefrontal regulatory centers enlarge considerably the scope of behavioral control, allowing the realization of very complex aims, mediated by deliberative effort and abstract planning and reasoning. This research suggests that in humans, critical thinking is a part of

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37) Martin Stuart-Fox, "The Origins of Causal Cognition in Early Hominins," *Biology and Philosophy* 30, no. 2 (March 2015), <https://doi.org/10.1007/s10539-014-9462-y>.

38) Gray and McNaughton, *Neuropsychology of Anxiety*, 51.

39) *Ibid.*, 48.

40) Cf. John Dewey, "The Reflex Arc Concept in Psychology," *The Psychological Review* 4, no. 3, (July 1896): 357–370. <https://doi.org/10.1037/h0070405>.

41) Gray and McNaughton, *The Neuropsychology of Anxiety*, 123, 131.

42) Frank Middleton and Peter Strick, "Anatomical Evidence for Cerebellar and Basal Ganglia Involvement in Higher Cognitive Function," *Science* 5184, no. 266 (October 1994): 458–61, <https://doi.org/10.1126/science.7939688>; Frank Middleton and Peter Strick, "Cerebellar Projections to the Prefrontal Cortex of the Primate," *The Journal of Neuroscience* 21, no. 2 (January 2001): 700–12, <https://doi.org/10.1523/JNEUROSCI.21-02-00700.2001>.

self-regulatory loops, which is to say that its main function is to enhance the investigative procedures motivated by need to anticipate threats and process novelty during pursuits. As some authors maintain, abstract thinking is simply a form of activity in which tacit cognitive schemas themselves become objects of investigation,<sup>43</sup> which makes it an advanced form of self-scrutiny (as discussed above). What this means is that the possibility of meta-analysis (and hence second-order discourse) is an evolutionary achievement which does not automatically lead to a “secondary modification of our primary being-in-the-world,”<sup>44</sup> but constitutes an essential part of our being humans. Admittedly, abstract thinking may lead to objectification (of oneself and another), and thus result in “alienation,” but this happens only when one’s intellectual activities are not properly guided and animated by the goal of solving a problem.

## Conclusion

We have delineated three different models of action and three corresponding motivations. It has been suggested that the model of the self-sufficient, “monological” subject and the model of subject implied by language-game theory are both abstractions to be integrated by means of the conception of the explorative subject. In other words, what I attempted to show is that our behaviors are subordinated to larger purposes that have to do with the need and the ability to improve both performance and our understanding thereof (its purpose).

The explorative subject entails that we are always-already in the middle of something and rely on action blueprints that we take for granted; in this sense, our goals, intentions, and action blueprints precede our conscious awareness of them. This is consistent with the assumptions of language-game theory. What the latter does not take into account, however, is that while we normally perceive our intentions and methods as inextricably linked, our goals and intentions are frequently ill-defined,<sup>45</sup> blended and mutually contaminated.<sup>46</sup> Since our goals and intentions are obscure even to ourselves, goal-attainment is also a process of learning and discovery of that which drives us. In other words, the need for critical distancing does not stem from the need for a top-down regulation of conduct, but rather springs from the fact that our “being-in-the-world” is challenging and requires constant scrutiny. Crucially, the form of critique that is embedded in every action (pursuit) is an immanent form of critique. It does not presume to question our epistemic and pragmatic credentials; to the contrary, it presupposes them. The thing is that there is not a better way to affirm the credentials than through learning which leads to an improvement in both cognitive and practical domains.

As mentioned at the beginning, underlying the LCA is the idea that meaning reduces to reference,<sup>47</sup> wherefrom it follows that a change of a game amounts to a change of reference. But there is a dilemma: either reference is independent from meaning (sense), in which case the objective validity of our claims is automatically put into question, or the meaning and reference are inseparable, which in turn makes it difficult to account for

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43) Antonio Damasio, *The Feeling of What Happens: Body and Emotion in the Making of Consciousness* (New York: Hartcourt, 1999), 199; Antonio Damasio, *Self Comes to Mind: Constructing of the Conscious Brain* (New York: Vintage Books, 2010), 190ff.; George Lakoff and Mark Johnson, *Philosophy in the Flesh: The Embodied Mind and Its Challenge to Western Thought*, (New York: Basic Books, 1999); Mark Johnson, *The Meaning of the Body: Aesthetics of Human Understanding* (Chicago: Chicago University Press, 2007), 27–31, 170–175; 188–195; Merlin Donald, *The Origins of the Modern Mind: Three Stages of the Evolution of Culture and Cognition* (Cambridge, MA: Harvard University Press, 1991).

44) Shaun Gallagher and Dan Zahavi, *The Phenomenological Mind* (London: Routledge, 2008), 154.

45) Gary A. Klein et al., “Macro-cognition,” *Journal of IEEE Intelligent System* 18, no. 3 (May–June 2003): 81–85, <https://doi.org/10.1109/MIS.2003.1200735>.

46) Laughlin, *Jungian Theory and Therapy*.

47) Apel, *Toward a Transformation of Philosophy*.

the fact that the performer can critically attend to his or her performances. Considering exploratory behaviors, however, a different option suggests itself:

From the perspective of exploratory attitudes, our behavior is organized into cycles, every step of which is assessed in terms of its putative contribution to a wider goal. The goal (e.g. the problem to solve) can be imagined as the center of the circle in relation to which the subject can take different positions.<sup>48</sup> The important thing is that an effective pursuit hinges on the agent's ability to integrate these different perspectives on the problem and coordinate associated actions (performances) into a flexible action plan. In other words, granted that the subject has a certain amount of freedom to approach the object from different standpoints, one ceases to be forced to accept that every performance delineates a different object. The ability to move around the frame of reference pertinent to a problem-situation is a form of distancing, and hence of "objectification," but this form of relative distancing – whose scope increases with growing cognitive ability and self-regulatory capacity – does not necessarily distort the object. To the contrary, it may facilitate a better grasp thereof.

All in all, the above considerations suggest that the alleged internal connection between different components of action is not a given, but rather amounts to a regulative principle which motivates continual mutual readjustments between means and goals.

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48) We can further imagine a circle with an infinite circumference that contains different circles within circles. The advancement of understanding would be represented by growing clarity as to how these different circles relate to one another, whereby a map is being developed.

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