

Neuropsychology of Self-Regulation: Attention Control Mechanism for Controlling Thinking and Other Cognitive Processes

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Abstract:

This paper presents a comprehensive theoretical framework for understanding and consciously controlling the cognitive faculty of attention. It analyzes how language and the subject-object dichotomy fundamentally shape human thought processes. The pivotal role of attention in steering cognitive functions is examined, along with how it is influenced by cognitive biases. The brain is conceptualized as an information processing system, with attention serving as the navigational mechanism guiding cognitive faculties. The framework emphasizes the importance of articulation to effectively regulate attentional allocation. Innovative techniques are given, including a modified self-questioning method that leverages the linguistic basis of cognition to monitor and rectify attentional lapses. Grounded in neuroscience, psychology, and evolutionary theory, the paper elucidates neurological mechanisms behind conscious attentional control, including how to stop the thinking process. Potential applications range from improving cognitive performance and emotional regulation to facilitating goal attainment and overall well-being across domains.

1. Introduction and context

Humans are the only species of animal on earth that boasts of having such a complicated language system, but evidently it has been conferred upon us by nature through compounded complexity of evolution, and is not something which is developed through conscious efforts. Upon retrograde analysis of the nature of most of languages we possess as a species, we find that nearly all of our language system suffers a fundamental limitation of dividing everything into subject-object dichotomy; everything which is expressed through (most of) language systems are divided into a subject and object, even in cases where do not exist any such division in reality. Taking examples from psychology, this division is apparent in concepts such as of “self-confidence” (who is putting confidence in whom?), “self-respect” (who is respecting whom?), “self-awareness” (Who is aware of whom?), “self-acceptance” (who is accepting whom?), “self-love” (who is loving whom?), and so on. Upon deeper reflection we find that underlying all these concepts are only conflicting thought processes wherein the individual is unable to identify himself with one of those. Whatever the brain/mind might think, it inevitable ends up being encapsulated in language, and thus a subject-object dichotomy is created for everything a human might think. This is what enables and fuels the thinking process, since this differentiation between subject (self) and objects (thoughts) always exists, allowing the self/mind/brain to think of various objects/concepts/etc.. This is verily the reason in psychotherapy the patients are taught to label their thoughts and emotions because this

very process of labelling highlights the subject-object dichotomy and thus create a distance between the self and that thought/emotion, allowing the patient to move on to another one.

Looking at this from another perspective, we humans tend to understand this one singular reality/universe by dividing it up linguistically/conceptually into various objects, allowing for manipulation. Some prominent fundamental examples would include the following :

- **Color:** The light spectrum is a continuous range of wavelengths. We separate this continuum into discrete colors like red, green, and blue. This allows us to talk about and manipulate colored objects easily.
- **Time:** Time is a continuous flow, but we break it down into units like seconds, minutes, hours, etc. This lets us schedule events, measure duration, and coordinate actions.
- **Matter:** At the atomic level, everything is fundamentally tiny particles. Yet, in our everyday world, we categorize matter into objects like chairs, tables, and cars. This lets us interact with the physical world more easily.

Thus, everything in the outer reality (physical universe) as well as our inner subjective reality (mind) is divided into an assortment of objects, created by the subject-object dichotomy of language, and with this context comes into play the faculty of “attention” of the brain.

2. Understanding the nature and role of Attention

Today’s neuroscience agree that the human brain can only process one thought at a time, even while during jumping from one thought to another within a fraction of a second, still it is a linear sequence of thoughts, processing only one particular thought at a given time. In accordance with the widely-accepted understanding of neuroscience and psychology, attention can be understood metaphorically as a “torch” or a “beam of light” of the conscious awareness of brain, illuminating one particular object at any given point of time. That particular object can be either in the inner reality/mind (thoughts, emotions, etc.) or the outer reality/universe (sensory stimulus from any particular sense organ at a given time). Although humans have developed the cerebral cortex and frontal lobe in brain allowing for the conscious control of attention, it still largely remains in control of the cognitive biases. Cognitive biases can be alternatively understood as innate blueprints for steering attention programmed neuropsychologically into the brain/mind complex through the evolutionary processes. For any given point of time whenever we choose not to control our attention through conscious efforts (which apparently occurs most of the time), nature has given us cognitive biases to facilitate unconscious or subconscious regulation of attention.

Brain is an organ evolved by nature through various evolutionary processes for facilitating the survival and reproduction of the individual and his group, thus making the brain a machine which processes information – to either achieve an intended outcome/goal set consciously by the individual, or as per the cognitive biases. All cognitive biases are the byproducts of the evolutionary process, for the purpose of facilitating individual’s and group’s survival and reproduction, and cognitive biases can also be understood as adaptations that help individuals navigate complex social and environmental landscapes more effectively and efficiently. Metaphorically, the brain is an organ evolved to help in navigation – for navigating through life – and attention is the steering wheel. The faculty of attention drives all other cognitive faculties (excluding cognitive biases).

This metaphor of navigation needs to be understood as a guiding principle for understanding the role and function of attention in our cognitive processes. Just as a steering wheel directs a vehicle through various terrains and obstacles, attention directs our cognitive functions toward relevant information while filtering

out distractions. Just as a skilled navigator must carefully choose where to focus their attention in order to successfully navigate through diverse and often unpredictable terrains, so too must individuals strategically allocate their attention to navigate through the complexities of life. Cognitive biases can simply be understood as “autopilot” software within this metaphor.

In practical terms, this metaphor emphasizes the importance of consciously directing attention towards relevant information, which automatically filters out distractions. Much like a navigator adjusts their course based on changing environmental factors, individuals must adaptively shift their attentional focus to align with their goals and objectives. This requires a nuanced understanding of when to broaden attention to take in new information and when to narrow focus to concentrate on specific tasks or objectives. Moreover, just as a navigator relies on maps and GPS to guide their journey, individuals should utilize the various strategies given in this paper to optimize their control of attention.

3. Mechanism for Conscious control of Attention

At its core, controlling attention refers to the ability to selectively focus on particular aspects of our environment or mental representations while simultaneously suppressing irrelevant or distracting information. There underlies a universal mechanism for controlling attention, a fundamental process deeply ingrained within the architecture of the human brain. As we understood that the brain is a machine which processes information – and when not processing information on autopilot mode through cognitive biases, it processes information to achieve an intended outcome/goal set consciously by the individual – with the keynote that that intended outcome should be actionable, achievable and articulate. This intentional direction of the brain's processing power is where the concept of controlling attention becomes paramount. It's akin to steering a ship amidst a vast ocean; without a clear destination or course correction, we may drift aimlessly or be at the mercy of external currents.

To harness this innate ability effectively, one must first define their goals with clarity and specificity. Vague intentions lack the gravitational pull needed to anchor the attention. For instance, instead of merely aiming to "be successful," one could specify measurable milestones such as "increase annual income by 20% within the next two years" or "complete a marathon within six months". This also applies to the inner world within the mind – if an individual wants to think about “something positive” or not think about “negative things”, they should specify what constitutes "something positive" or "negative things". This specificity in goal-setting serves as the metaphorical compass for the attention, guiding it toward the intended direction. This level of specificity facilitates a clear roadmap for the mind/brain to follow, akin to inputting precise coordinates into a GPS device. When one defines his objectives with such clarity and articulation, his subconscious mind can efficiently filter through the vast array of stimuli present in his environment, guiding his thinking and actions towards the attainment of his desired outcomes.

Journaling is a powerful tool to facilitate this process of goal-setting with clarity and specificity. By putting pen to paper (or fingers to keyboard), individuals can delve into their thoughts and articulate their intentions with precision. The act of journaling transforms vague aspirations into a tangible plan. Through this process, individuals can refine their goals, break them down into actionable steps, and identify potential obstacles. This written record serves as a dynamic roadmap, constantly evolving alongside their progress. It provides a source of inspiration, reminding one of his aspirations and reigniting his motivation whenever they revisit its pages. With clear goals acting as the compass and a journal serving as their personalized roadmap, individuals are empowered to harness the immense power of their attention to navigate the complexities of life and achieve their dreams.

Secondly, the next step in controlling attention is monitoring the attention. This involves checking-in with oneself to assess where the attention is directed and whether it aligns with his defined goals and intentions. This can be done in real-time through “labelling” - a technique where the individual identifies the distracting thought or object/stimulus and names it for what it is, in a non-judgmental way. This simple act of acknowledging the distraction disrupts its automatic processing and allows the individual to consciously choose to refocus on their task. For example, if someone is studying for an exam and finds his attention distracted by a buzzing phone notification, labelling it in real-time as "phone notification" can disrupt the hold it has on their focus. But labelling can go beyond just identifying the distraction. The individual can also label the emotional response the distraction triggers. For example, he might recognize the notification is causing him to feel anxious about missing out on something important. Labelling this emotional response can help him detach from it and return his focus to studying.

Labelling serves not only to identify distractions but also as a bridge to a more profound state of self-awareness. Through this practice, individuals can explore the intricate interplay between their attention and emotions. By labelling both the distraction itself and the emotional response it triggers, one can cultivate a more mindful state of awareness. This heightened self-understanding can illuminate the underlying causes of one’s attentional lapses and empower them to make more intentional choices about where to direct their focus. The mechanism behind this functioning of labelling is the subject-object dichotomy of language as discussed earlier. Since the brain is evolved for survival and reproduction – labelling itself is enough to trigger a corrective response for attention. Labelling can be made significantly easier using the Self-Questioning Therapy (SQT). The following set of 5 questions is a modified version of SQT created by the author for the purpose of controlling attention at any given point of time using the power of labelling(subject-object dichotomy) :

- “What am I thinking about right now?” This simple question helps to bring attention back to the present moment and identify any distracting thoughts.
- “Is this present thought helpful or unhelpful?” By evaluating the content of the thought, you can determine if it is serving you or taking you off track.
- “What emotions are my present thoughts triggering?” Identifying the emotion can provide clues about the root cause of the distraction. For example, are you feeling anxious, bored, or lonely?
- “How does this present thought/emotion fit into my larger goals?” Taking a step back and considering the long-term goals can help you refocus on what is truly important.
- “What can I do to bring my attention back to the task at hand?” This question empowers you to take action and regain control of your focus.

By asking these questions (preferable in the same sequence) and reflecting on the answers (either in mind or in written for more impact), individuals can gain valuable insights into their attention patterns and triggers, effectively and efficiently monitoring their present attention for auto-correction by mind/brain.

The third and the final step in controlling awareness is to learn the COGNISHEILD technique, which can be described in easier words as shifting the attention to the present space and present time by using sensory organs. We go back to our metaphor of attention being a “torch” or a “beam of light” of the conscious awareness of brain, illuminating one particular object at any given point of time. This torch or beam of awareness can either be pointed onto objects inside the mind such as thoughts, memories, emotions, or it can be pointed outside to the present moment of time and space through the sensory organs. COGNISHEILD teaches one to deliberately turn the attention onto the present moment, by engaging the senses. This involves actively noticing sights, sounds, smells, tastes, and touches happening around you.

As long as the attention is directed towards the outer world be actively using the sensory organs, the inner world (mind) experiences a drastic reduction in activity.

This is due to the finite capacity of conscious awareness. When attention is actively directed towards the external world through the sensory organs, cognitive faculties are redirected away from internal mental processes. Consequently, the mind experiences a drastic decrease in spontaneous thought generation, emotional reactivity, and rumination on the past and future. By strategically deploying the senses, the COGNISHEILD technique fosters present-moment awareness and serves as a cognitive shield against the intrusion of internal disruptions.

Practising COGNISHEILD technique does not interfere with the present actions and whatever the individual is doing because the act of observing through the senses does not require analysis or judgment. It's a simple act of noticing, like taking a mental snapshot of the present moment. This allows one to remain fully engaged in his present activity while still keeping the awareness anchored in the present through your senses. It is like riding a bike - you can focus on the road and scenery (sensory details) while still pedalling and steering (performing the action). Observing through the senses is a receptive process, rather than an analytical one - one can appreciate the sights and smells of the flowers (sensory details) while still continuing to walk (performing the action).

4. Ending note

We can summarize the mechanism of controlling attention as described in this paper into three steps :

1. Set clear and articulate intended outcomes/goals to regulate subconscious mind (use Journaling)
2. Monitor attention and label distractions to keep mind on intended track (use Self-Questioning Therapy)
3. Stop unnecessary thinking by shifting attention to outer reality using COGNISHEILD technique.

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