Goal and behavior setting: The structured and unstructured self-regulation model

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ABSTRACT

Self-regulation, the ability to control our thoughts, emotions, and behaviors, is critical to success in many areas of life. This paper investigates the neural mechanisms underlying this complex ability, focusing on goals, priming, and the SUSR (Structured and Unstructured Self-Regulation) model.

Initially, the neural bases of self-regulation are explored, highlighting the brain regions involved in planning, inhibitory control and decision-making. The importance of goals as guides to action is emphasized, and different types of goals (short-term and long-term, specific and general) are discussed. Clear goal setting and consistent pursuit are presented as crucial for effective self-regulation.

The concept of priming, i.e., the activation of concepts or ideas in the mind that influence subsequent behavior, is introduced. Studies show that priming can modulate self-regulation, either facilitating or hindering the achievement of goals. The article discusses how priming can be used to promote more adaptive behaviors.

Finally, the SUSR model is presented as a theoretical framework to understand the processes of self-regulation. This model distinguishes between structured self-regulation, which involves the planning and execution of actions in a deliberate manner, and unstructured self-regulation, which occurs more automatically and habitually. The SUSR model offers a comprehensive perspective on the different levels of cognitive control involved in self-regulation.

Keywords: Self-regulation, Goals, Priming, SUSR Model, Neuroscience, Cognitive control.

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INTRODUCTION

Self-regulation refers to an individual's automatic and controlled efforts to alter behavior, cognition, responses, and suppress impulses, with adaptive and goal-oriented goals (Luszczynska et al., 2004). Most theories of goal-oriented self-regulation include the notion that goals are internal representations of desired states, leading the individual through a process of goal setting, comparing progress against goals, and adapting cognitive and behavioral responses to increase the chances of success (Koch & Nafziger, 2011). In the comparison process, two possibilities are experienced, related to a general feeling of approaching or distancing from the goal, described as cycles of reduction and widening of the discrepancy. The cycle of reducing the discrepancy results from a comparison between the current state and the desired state, in which the individual feels that the goals are getting closer to being achieved. This positive feedback helps the individual sustain the effort toward goal completion, while on the other hand, if there is a sense of detachment, the negative feedback can lead the individual to decrease the effort (Lord, Diefendorff, Schmidt, & Hall, 2010).

Different theories of self-regulation have been utilized over the years to explain goal-seeking in many aspects, such as long-term and short-term goals, or even in specific areas such as academic and work-related achievement goals (Latham, 2016). In addition, especially since the theory of goals was incorporated into the theoretical framework, studies on self-regulation have contributed over the years to a better understanding of social behavior and information processing (Koole & Fockenberg, 2011; Shah & Kruglanski, 2003; Vancouver, Weinhardt, & Schmidt, 2010).

Some aspects of self-regulation are important for understanding how an individual can progress toward goal achievement. For example, the theory of regulatory focus postulates two orientations of self-regulation: prevention (when the individual directs his behavior with a focus on security needs and loss avoidance) and promotion (when the focus is directed to needs to advance and approximate gains), with measures already validated (Cesario, Higgins, & Scholer, 2008). Promotion and prevention have contributed to the understanding not only of the self-regulation process itself, but especially of how individual differences can lead to a more active or passive orientation towards goals.

NEURAL BASES OF SELF-REGULATION

Self-regulation depends on several cognitive processes, which need to be considered and taken into account to better explain the internal events that can affect how the individual controls and regulates behavior. If we consider evolutionary needs, the beginning of life in groups was decisively marked by the efficiency with which individuals read, understood and adapted to the patterns of the group – an incipient form of self-regulation. To be proficient in this endeavor, it was necessary for individuals to alter their behavior, control impulses, thoughts, and actions, to relate better to others

and remain part of the group, increasing the chances of survival, which makes it plausible to assume that the brain evolved to develop specific mechanisms for this.

The neuroscience literature indicates that some cortical regions are related to self-regulatory processes, especially the prefrontal cortex (PFC) and its executive functions associated with self-regulation (Heatherton & Wagner, 2011). If we consider, for example, the classic case of Phineas Gage and the damage to the CPF, which resulted in a radical change in behavior and personality, most of the transformation occurred due to uninhibited behavior, lack of conformity to social norms, and impulsive actions, all related to an impairment of self-regulatory functions (Heatherton, 2011).

Autoregulatory functions are often linked to three specific areas of the PFC: the ventromedial prefrontal cortex (mPFC), the orbitofrontal cortex (LOC), and the lateral prefrontal cortex (PFC), which, when damaged, lead patients to different manifestations of self-regulatory problems, such as difficulties in managing social and affective life, as well as antisocial, violent, and compulsive behaviors (Suvorov & van De Ven, 2008). An interesting aspect of these cases is that individuals were still aware of social norms and, although they were aware of socially expected behaviors, they were unable to comply, reinforcing the idea that the CPF is not merely a repository of social norms, but a self-regulatory instance. In addition, the PFC is related to executive functions deeply linked to self-regulation, such as decision-making, planning, working memory, attentional filtering, and response inhibition (Petersen & Posner, 2012).

Damage to mPFC is linked to severe difficulties in primary physiological drives, as well as a general dysregulation of different forms of social behavior, while patients with damage to lPFC, although able to behave according to social norms, report difficulties in initiating and planning behaviors, struggling to set and pursue goals (Heatherton, 2011). Another important region related to self-regulation processes is the anterior cingulate cortex (ACC), which is responsible for cognitive control and conflict monitoring, with patients with damage in this area often experiencing symptoms such as lack of motivation and difficulty engaging in goal-oriented behaviors. The literature in the area points out that this area may be responsible for signaling the need for self-regulation in a specific situation (Heatherton & Wagner, 2011).

In line with these findings in neuroscience, the self-regulatory strength model proposes that self-regulation relies on a general resource that, when depleted, can lead to impoverished self-regulation. Some researchers have found evidence to suggest that even individuals without harm in these areas, when faced with resource depletion, report failures in self-regulatory processes in a variety of domains, such as diet, alcohol abuse, and even sports performance (Baumeister, Vohs, & Tice, 2007; Chan et al., 2015; Hagger, Wood, Stiff, & Chatzisarantis, 2010).

GOALS, GOAL SETTING, AND GOAL PURSUIT

Human behavior is often conceptualized as the final step in a process initiated by an environmental demand, which leads to information processing, planning, and then interventions in the social world, what we call action or behavior. After processing environmental demands and adding pre-existing information to the equation, individuals are often led to set goals, such as mental representations of actions or behavioral outcomes that are desirable or rewarding (Dijksterhuis & Aarts, 2010). Consequently, the desired behavior or outcome becomes the present goal, especially considering the expected reward or desirability.

This active goal or goals then become the main reference for actions, usually guiding most of our cognitive processes, such as attention, memory, and decision-making. For example, in one experiment, neutral behaviors (doing puzzles, going for a walk) were subliminally paired with positive, negative, or neutral words, so that participants could perceive the valence word but not the activity. Subsequently, the participants not only showed a tendency to engage in the conditioned activities positively, but also completed a task more quickly than the control group when they promised to participate in the activity after the task. Under these conditions, not only did the activity become a goal, but it also directed cognitive processes toward the pursuit of the goal (Custers & Aarts, 2005).

The literature on goals, goal setting, and goal pursuit distinguishes two broad perspectives for understanding how individuals set goals and pursue them. One perspective focuses on the content of a goal as the main aspect, as investigated and described in studies on academic goals (Komarraju & Nadler, 2013) and work-related goals (Lord et al., 2010). Another perspective proposes that, more than content, the effective use of self-regulatory strategies is the main aspect in relation to the definition and pursuit of goals (Oettingen & Gollwitzer, 2010).

When observing general behavior, it is not only relatively easy to infer a goal or set of goals from the observed individual, but most of the time people use this information in interpersonal interactions, offering answers based on the inferred goal (Stanovich & West, 2003). Individuals are educated from childhood to identify goals and behave to achieve specific demands, not only in school but in most domains of social life, being rewarded when they succeed in this attempt and punished when they fail (McCarthy, Jones, Harwood, & Davenport, 2010).

It is a relatively consensual understanding that goals serve as tools for individuals to engage in volitional behaviors, defining what they find rewarding to achieve and influencing strategies and effort in the pursuit of those goals. Goals are usually described as representations of desired states or behaviors that guide our efforts and direct our behavior toward their achievement (Dijksterhuis & Aarts, 2010). Because goal attainment is often a rewarding experience, individuals develop strategies to maintain goal-directed behaviors (Marien et al., 2012). At this point, an important issue arises,

which is the awareness of the goal-setting process, and it is useful to make a distinction between conscious and unconscious goals. A conscious goal can be verbalized and expressed as what we usually describe as volition or intention. Unconscious goals cannot be expressed, since the individual is not aware of the process, although information processing and other cognitive processes are functional and affecting behavior. The literature on goals is vast, and different taxonomies have been produced over the years, followed by many goal-like concepts. The general understanding is that the goals have six major dimensions (Austin & Vancouver, 1996):

(a) importance-commitment

(b) level of difficulty

(c) specificity-representation

(d) alcance temporal

(e) level of consciousness

(f) connection-complexity.

These dimensions also vary in three main perspectives: person, time, and goals. The person's perspective concerns individual interpretations and general differences for the same goal. The time perspective deals with changes in goals over time, not just at the individual level, but more generally. The goal perspective focuses on the interaction between goals in an individual. These perspectives are primarily individual, but the environment also plays an important role in goal activation, even when we consider unintentional goal setting or unconscious goals. Goals not only can, but most of the time they are activated without the individual's knowledge (Marien et al., 2012). If we consider that a person is capable of setting goals to pursue without being aware of the process, this brings a complex perspective of the phenomena involved in goal setting and pursuit.

It is common to perceive behavior as the result of a planned and intentional effort, and the pursuit of goals is usually consciously defined, with the agency of the self being the result of conscious choices and planning. However, recent findings challenge this notion, with research, mostly experimental, showing that the mere activation of a meta representation guides the behavior and higher cognitive processes involved in goal-directed behavior, without the individual's awareness (Kelley, Wagner, & Heatherton, 2013). Goals inferred from another person's actions can also be activated in an observer and can control subsequent behavior without conscious intention, thus leading to goal contagion (Capa, Cleeremans, Bustin, Bouquet, & Hansenne, 2011). With the establishment of goals, there is a need to adopt strategies to achieve them, a process of planning and maintaining appropriate cognitive and behavioral responses that can be described through self-regulation theories.

The general understanding is that conscious decisions are just one way goals can influence behavior. For example, the automotive model (Bargh et al., 2012) proposes that goals can not only be

activated outside of consciousness, but also that unconsciously activated goals are effective in providing guidelines for behavior in a similar way to conscious goals.

About the very idea of a goal, it is reasonable to assume that the goal that an individual adopts, consciously or unconsciously, has significant significance in terms of rewards and expectations of achievement. Three aspects that guide recent research on the topic will be discussed as significant aspects that affect regulatory dynamics: regulatory adjustment, regulatory engagement, and accessibility. They are commonly related to goals and affect the setting and pursuit of goals.

First, the notion that goal orientation needs some sustaining strategy is relatively consensual, otherwise the individual would struggle to stay aligned with his or her own goals. A goal can be sustained, that is, have regulatory adjustment, or it can be interrupted, if there is a regulatory mismatch, which depends not only on the goal itself, but also on the strategy adopted to pursue this goal (Cesario et al., 2008). Regulatory adjustment theory proposes that there needs to be a correspondence between the orientation towards a goal and the strategies that the individual adopts to get closer to that goal, and that these strategies can produce a state of regulatory adjustment that not only creates a sense of correctness in the pursuit of the goal, but also increases engagement in the task (Aarts, Custers, & Veltkamp, 2008; Förster, Liberman, & Higgins, 2005). In the same perspective, an important aspect of regulatory dynamics is the theory of regulatory engagement, which proposes the presence of a motivational force that can attract or repel a goal, depending on the goal's attributes, such as values and other hedonic sources of direction (Cesario et al., 2008).

For example, an individual may be drawn to a goal in a relatively weak or strong way (low or high positive value) or may feel repulsion as a relatively weak or strong force (low or high negative value). The two forces vary in intensity and direction, although they are perceived as a complete experience. There are aspects of direction and intensity that can affect the experience, with the intensity and direction of the value working independently. This means that the more intensely an individual is engaged in an activity, the more intense the experience of motivational force will be. In other words, engagement serves as an enhancer of the directional component of value experience. Consequently, an individual who is more strongly engaged in the pursuit of a goal will experience a positive target more positively and a negative target more negatively (Förster et al., 2005; Murray, Gomillion, Holmes, Harris, & Lamarche, 2012).

To be able to engage and adapt to a goal, some information needs to be accessible to the individual. Even if the information is processed outside of consciousness, it needs to be accessible in some way. The notion of accessibility is used to describe the degree to which a mental representation is currently active, more specifically in terms of information that forms concepts and, obviously, personal goals, determining social perception, influencing cognitive processing, and thus behavior (Förster et al., 2005).

PRIMING AND SELF-REGULATION

Priming refers to the cognitive, motivational, affective, and behavioral consequences of the presentation of certain stimuli, to facilitate access to certain content, modifying subsequent behavior (Molden, 2014). For many years, ideomotor and self-motivation models have been largely responsible for the general understanding of how the mechanisms of priming effects work. According to the ideomotor model, stimuli automatically activate mental representations that determine the individual's behavior, while the self-motivation model suggests that motivational stimuli activate representations linked to specific goals or objectives, which, in turn, would be responsible for activating behaviors directed to these goals (Wheeler, Petty, & Al, 2014).

Studies on goal priming have shown that different stimuli can be used to enhance goal-setting and pursuit processes, leading to better self-regulation and increasing the chances of achieving goals. Stimuli related to the means of achieving goals, also referred to as implementation sets, improved performance (Shah & Kruglanski, 2003).

Some studies also suggest that the goal-pursuing strategies adopted can increase the salience of goal representation, not only by broadening the ways in which it can be activated by priming, but also by facilitating the maintenance of goal-seeking behavior by promoting self-regulatory processes (Gollwitzer, Sheeran, Trotschel, & Webb, 2011). A good example is given by the same authors, who suggest that an individual may be more likely to make purchases after making a shopping list, as making the list makes the goal of shopping more activated, increasing the number of environmental signals that can activate this behavior. Priming effects have also been investigated in emotional self-regulation, with results indicating that emotional reactions can be controlled more effectively through this type of effect, depending on some dispositional variables, such as action-oriented or state-oriented regulation (Koole and Coenen, 2007). In the same study, action-oriented participants were more easily affected, mobilizing affective regulation more efficiently, indicating that subtle priming was sufficient to affect self-regulation.

Japanese researchers have also found interesting results on priming and self-regulation when investigating goal priming. Participants were influenced by specific goals, and then not only task performance was assessed, but also conscious goal editing, i.e., individuals intentionally performed small modifications to the goal to fine-tune their effort and increase the chances of success (Oikawa and Oikawa, 2010). According to them, after a goal is activated by priming, individuals can make conscious or unconscious adjustments during the goal-setting process, and depending on the fit and the task, not only does performance improve, but there is also less resource consumption. These authors also highlight that priming can be used to induce automatic goal pursuit, even when there are factors contrary to this specific behavior, such as diet, when an individual knows that they should eat

salad, but internal triggers are more likely to cause them to consume fat and sugar (Oikawa and Oikawa, 2010).

Also in studies on self-regulation in diets, Papies and Hamstra (2010) found that subtle diet priming evoked an effect in restricted eaters (individuals with the specific goal of avoiding unhealthy foods), which reduced unhealthy eating behavior compared to non-restricted eaters. The findings indicate that subtle priming of diet-related goals can enhance self-regulation in this context.

Another important aspect of the self-regulatory process is the validation of the process itself, which means that the individual will regulate behavior more easily when goals are perceived as important, thus deserving more resources and effort. The priming of goal-related concepts, when these concepts are validated, increases as the individual regulates behavior toward goal achievement (DeMarree et al., 2012).

Recently, despite the contribution of these models, the results of priming studies have been questioned in the scientific community due to replication problems, such as the absence of previously described effects, lack of cross-cultural replications, and even inconsistencies in the explanation of the phenomenon (Shanks et al., 2013). Recent studies, however, have brought new opportunities to study the effects of priming, especially those investigating the effect of moderators on the process (DeMarree et al., 2012).

In the studies discussed above, goal validation and implementation sets have been investigated, but more general and broad variables are rarely discussed as possible moderators in the process. It is important to investigate the effects of situational and dispositional variables on self-regulation in order to better understand the phenomenon.

THE STRUCTURED AND UNSTRUCTURED SELF-REGULATION MODEL (SUSR MODEL)

Fujita and Trope (2014) proposed a model describing two models of self-regulation, based on the presence or absence of goals. According to these authors, when a goal is established, the individual would engage a state of structured regulation, while in the absence of a goal, the individual would engage a state of unstructured regulation. While in the state of structured regulation, the individual would work with the goal of pursuing goals, with mental processing focused on information related to the goals and eliciting behavioral responses toward goal attainment. In unstructured regulation, the lack of goals would cause the individual to process the most salient information available and exhibit behavioral responses that adapt to the environment.

If we consider the model of Fujita and Trope (2014), a line of research could investigate how priming effects can be used to induce sophisticated self-regulatory processes, leading the individual to function in a specific regulatory dynamic, in which goals act as an important element that can

make certain cognitive contents more accessible and certain signals from the environment more salient, guiding behavior toward these goals (Baumeister et al., 2011).

According to Fujita and Trope (2014), subjects in a state of structured regulation, when influenced by priming, experience the activation of declarative knowledge, which facilitates subsequent behavior in relation to the stimulus presented — which, in many cases, refers to the individual's perception of the purpose of that specific task, and, therefore, the behavior seems appropriate to fulfill the goal (Gollwitzer et al., 2011). In the case of unstructured regulation, the priming effects obtained are usually activation procedures, rather than specific content, which leads individuals to act using the procedure mechanism.

The model proposed by Fujita and Trope (2014) describes two possibilities of stimulation that can lead to two different types of priming. Goal priming, when stimuli are related to goals and objectives, leading the individual to a process that the authors describe as a high-level construct, where the individual has his attention directed to the established goal, focusing attention on contextual elements that are related to the goal and controlling behavior towards this goal. Procedural priming occurs when the priming stimulus is not related to a goal, but to a procedure, form of action or technique, leading the individual to a state of low-level construct, in which, because he does not have a specific goal to achieve, he becomes more susceptible to contextual signals and even, as described in some experiments, showing a tendency to repeat techniques stimulated through priming (Doyen, Klein, Simons, & Cleeremans, 2014; Fujita & Trope, 2014; Wheeler et al., 2014).

Also, as part of self-regulation, there is a difference in cognitive processing when an individual is setting goals or trying to achieve them. When goals are being set, cognitive processing is described as deliberative cognition, and when goals are being pursued, cognition is implementative (Gollwitzer et al., 2011). As goals are the main aspect in the structured/unstructured regulation model, it is necessary to discuss the processes of defining and pursuing goals.

As a development of the model proposed by Fujita and Trope (2014), in which priming can be used to induce states of structured and unstructured regulation, it is necessary to describe these states according to recent research and discuss how these states can be induced and/or achieved. Since goals are a key element in the model, it is reasonable to start by describing the goal-setting process.

Fujita and Trope (2014) proposed a priming-induced possibility, but did not refer to the goal-setting process. This process can be described as the adoption of a specific goal that motivates an individual toward its fulfillment (Finkel, Fitzsimons, & VanDellen, 2016). Once the goal is established and the individual has the resources to achieve it, behavior and cognition will work toward its fulfillment (Locke & Latham, 2006). As a development of the model, target setting should be the first step in the process, positioned between priming and regulatory states, meaning that

priming can be used to induce target setting, which in turn induces regulatory states. This proposition, made by Victorino and Pilati (2019), deepens the complexity of the model, with the processes of goal definition as probable mediators in the induction of regulatory states by priming. As a second step, if after the goal-setting process the individual successfully sets a goal, he would then be in a state of structured regulation; If no target is set, it would lead to the state of unstructured regulation. Considering that the main difference between states is that targets can be set in advance (structured regulation) or be context-related (unstructured regulation), it is plausible to assume that both states are likely to be affected by moderators, such as self-control, regulatory adjustment, and regulatory focus, present in the process to keep efforts correctly targeted. As a third step, according to each regulatory state, the cognitive architecture would then be ready to direct information processing, behavior control, and other cognitive processes toward goal fulfillment (in the regulated state) or adaptation to the context (in the unregulated state).

Induction by priming, as well as the possible moderators and mediators, are not described in the model of Fujita and Trope (2014) have been successfully investigated (Victorino and Pilati, 2019), specifically in the Brazilian reality.

If we consider that, in everyday life, various elements of the context and even the interpretation of the subject can act as stimuli to trigger priming effects, the need to better understand this mechanism and, above all, to investigate its effects on human behavior becomes evident. In addition, the role of potential moderators should be investigated, e.g., self-control, regulatory adjustment, and regulatory focus.

Describing these states and producing experimental evidence about them is necessary to broaden our possibilities of understanding how an individual can regulate their own behavior, but first, to understand how the presence or absence of a clear goal affects, which can provide empirical knowledge on the topic and improve future efforts.

CONCLUSION

The mechanisms of self-regulation, priming, and the interaction between goals and behavior were addressed here, exploring how these processes manifest themselves both at the conscious and unconscious levels. Analysis of different theories and models, such as the Structured and Unstructured Self-Regulation Model, offers a detailed perspective on how individuals set goals and adjust their actions to achieve desired outcomes. In addition, the empirical studies described throughout the work demonstrate that the environment and contextual factors can decisively influence the process of behavioral regulation, often automatically and unintentionally.

Given the complexity and breadth of the topic, it is evident that there is still much to be investigated. One of the main directions for future research lies in further exploration of the

moderators and mediators who influence the process of self-regulation. Variables such as self-control, regulatory focus, and adjustment to goals are essential aspects that deserve greater attention in different contexts. In addition, investigating how these processes manifest themselves in different cultures and in practical situations of everyday life is a rich area of study. Experiments that examine how these dynamics work in a variety of settings, such as in the workplace, educational settings, or social interactions, could significantly expand our understanding of the topic.

In the practical field, the findings presented in this article have clear implications. Understanding the mechanisms of self-regulation can be applied in the development of strategies to increase efficiency and performance in work environments, in team management and even in the promotion of individual well-being. The application of priming techniques, for example, can be used to encourage healthier behaviors, improve task performance, and facilitate the achievement of personal and professional goals. Thus, the knowledge discussed here offers a path to practical interventions that can improve the way we manage our own behavior and help others achieve better outcomes.

It is therefore concluded that both the academic field and the practical world have much to gain from new investigations on self-regulation and priming. The advancement of this research will allow a more precise understanding of how goals influence human behavior, as well as the development of effective solutions to optimize these processes in everyday contexts.

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