Theories and Research Advances Related to Self-depletion

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Abstract

Self-depletion is the cognitive state of reduced resources for self-control, a temporary reduction in the ability or willingness of the self to engage in volitional action (including controlling the environment, controlling the self, making choices, and initiating action) as a result of prior volitional exercise; and self-depletion leads to the self-depletion effect, a phenomenon that occurs when people's performance and performance on subsequent tasks requiring self-control decreases when they complete successive tasks that require self-control. This paper outlines three theoretical models of ego attrition: the limited resource theory model, the ego attrition process model and the motivational intensity theory to illustrate the internal mechanisms of ego attrition; it also introduces the ego attrition triggering task and discusses the measurement of ego attrition to lead to possible subsequent research, with a view to bringing inspiration for subsequent related research. Future research can also explore the core factors of ego depletion to find appropriate ways to improve ego depletion, and can also use positive thinking and other training methods to improve individuals' ability to combat ego depletion.

Keywords

Ego depletion, ego depletion effect, dual-task paradigm, ego depletion elicitation, ego depletion measurement

Introduction

The study of self-loss has received a great deal of attention from scholars in recent years, but it is also highly controversial; for example, self-loss has been questioned by many scholars as not existing at all, the evoking paradigm and measurement tools may be inadequate, and the self-loss effect is not strong enough to support the existence of the self-loss effect due to the strength of its evoking task, so subsequent research can explore the key factors affecting self-loss and explore new. The core factors that influence the ego-depletion effect can be explored and trained to ameliorate the harm caused by ego-depletion, as they lack sufficient self-control resources to control themselves to perform volitional behaviours.

1. The concept of ego depletion

Ego depletion refers to a temporary decrease in the ability or willingness of the self to engage in volitional actions (including controlling the environment, controlling the self, making choices and initiating actions) as a result of prior volitional exercise; in a state of ego depletion, individuals lack sufficient self-control resources to control themselves to perform volitional actions [1]. Therefore, when ego depletion is severe, the reduction in self-control can have a further impact on individual behaviour by affecting cognition, emotion, etc., as well as affecting personality traits [2]. For example, ego depletion reduces decision making rationality; ego depletion leads to cognitive
errors as individuals are unable to control their negative emotions; ego depletion leads to reduced attention and alertness; and ego depletion affects performance on tasks such as intellectual performance and logical reasoning [3, 4]. According to the power model of self-control, all self-control behaviours arise from limited mental resources, and initial self-control behaviours undermine subsequent self-control performance because they deplete limited resources, leaving insufficient resources for subsequent use. Self-depletion occurs when self-control resources are depleted, and subsequent self-control performance is hindered. On the other hand, the process model suggests that the root of ego depletion is not the depletion of some limited resource, but rather the motivation to take a break from work to engage in leisure activities [5]. That is, because effort control is by nature distasteful, people usually tend to avoid it. After effortful control is exerted, aversion builds up, leading people to more strongly avoid further control and to more strongly value and pursue rewards that bring satisfaction [6].

Baumeister et al. demonstrated the existence of an ego-depletion effect using a dual-task paradigm. The ego-depletion effect is a phenomenon in which people's performance and achievement in subsequent tasks requiring the use of self-control decreases when they continuously complete tasks requiring self-control. Based on the theory of limited self-control resources, this ego-depletion effect is a failure of self-control caused by a lack of resources. When the individual is severely depleted, self-control resources become scarce and self-control decreases, which can further influence behaviour by affecting the individual's cognition and emotions. It also affects personality traits that influence behavior [7]. A theoretical framework has been developed by Wing-Yuen Chen (2011) and others to address the aftereffects of ego depletion, which is often tested using a sequential task paradigm. In such studies, participants complete a task that is perceived to require self-control followed by the completion of another self-control task (the depletion state) or followed by the completion of a control task that does not require self-control (the control state). Participants in the depletion state typically perform worse than those in the control state, which is referred to as the ego depletion effect [8]. Research has shown that ego attrition effects exist in many areas such as attentional control, emotion regulation, impulse control, thought control and impression management.

2. Theoretical models of ego depletion

The aftereffects of ego depletion, a state caused by a failure of my control, have been of great interest to psychologists and researchers have continued to search for theoretical models that can explain the aftereffects of ego depletion. The following theories exist to explain it.

2.1 The limited resource theory model.

In 1994, Baumeister et al. [9] first proposed a limited resource theory based on previous research, which focused on the limited resource hypothesis as a core assumption and explicitly stated that self-control resources are a domain-general resource, and that the completion of self-control tasks is largely dependent on limited self-control resources. As self-control resources diminish, individuals temporarily remain in a state of 'self-attrition', which directly leads to self-control failure behaviour [4]. The following are important points from the limited resources theory: Firstly, it emphasises that psychological resources are limited and that self-control behaviour leads to a reduction in psychological resources, which affects subsequent behavioural performance. Secondly, adequate psychological resources are necessary to ensure proper executive functioning of the individual. This last point emphasises the individual variability and consistency of psychological resources across time. For example, individuals who are generally more capable of delayed gratification in early childhood are better at academic achievement and interpersonal skills in adulthood [10]. At the beginning of the study, many upheld the energy depletion view, which suggested that the reason for subsequent control failures was due to a lack of sufficient resources for self-control; in subsequent research, explanations for self-loss have expanded, and Baumeister proposed the Resource-conservation Model (RCM). It emphasises that depleted individuals will tend to conserve some of their self-control resources in case a critical task occurs. These perspectives clearly indicate that the previous stage of the self-control task leads to a reduction in mental resources and that this weak state of control directly leads to a decrease in the quality of subsequent self-control tasks, supporting the limited nature of self-control resources, and that this weak state of control is self-attrition [4]. As the research progressed, a model of self-control strength was further developed based on the Energy Resource of the Self-Control Resource Theory. The idea that self-control can be improved through deliberate practice in the same way that exercise builds muscle is central to the strength model. Previous research has shown that self-control training can significantly reduce the level of ego attrition, further increasing an individual's level of willpower and good performance in subsequent self-control tasks. At the same time, when aware of dwindling self-control resources, individuals are able to consciously conserve resources, similar to how athletes strive for better competition performance by conserving physical strength to reduce muscle fatigue. The strength model suggests that the severity of the depletion of self-control resources is largely based on whether the individual has the expectations and requirements for subsequent tasks. For example, individuals who anticipate a subsequent task
requiring self-control in order to conserve energy will perform more poorly at this stage.

2.2 The Process Model of Ego-depletion

The Process Model of Ego-depletion was first proposed by Inzlicht and Schmeichel in 2012 to explain the mechanism of action of the aftereffects of ego-depletion. The model emphasises that ego-depletion is due to the transfer of attentional processes and motivation to the optimal goal after the individual has performed the self-control task, rather than to the limited resources of self-control. The individual's motivation shifts after the previous stage of the self-control task and tends to perform behaviours that are pleasurable and self-satisfying, a shift in motivation from “should do” to “would do”. The attention process plays a role in the individual's performance of the self-control task by first identifying the self-control conflict and becoming aware of whether there is a conflict between the current temptation and the long-term goal. Next, the individual assesses the importance of each choice and uses effective self-control strategies to make the choice [11]. At this stage, the individual is engaged in conflict resolution and the adoption of effective self-regulation strategies. When individuals are faced with two choices of similar importance, motivational and attentional processes complement each other. The attention process becomes aware of the conflict between the two choices, and the individual develops a convergent motivation that leads to the direction of the individual's behaviour. The self-loss process model proposes that after exerting self-control in the first task, individuals will change their thought processes in the second task in two ways. First, the individual will shift from self-control motivation to satisfying individual impulses. Because the first self-control task requires a great deal of effort and the process is difficult, individuals will automatically relax in the second task after completing the first stage, but this does not indicate a reduction or disappearance of individual behaviour in the second stage. On the contrary, ego depletion increases the individual's impulsive motivation to engage in more rewarding or enjoyable tasks. Thus, it has been suggested that the after-effects of ego depletion are not the result of a reduction in individual self-control, but rather the result of a shift in motivation from self-control to self-satisfaction (de-inhibition). Second, for the shift in attention, after the first self-control task, individuals pay more attention to cues related to gratification than to those related to self-control. When individuals find a need for self-control, then they increase self-control in the next task. For example, the need for self-control is indicated when there is a conflict between self-goals and external requirements (e.g., ethical norms), and the PMED states that high ego attrition causes individuals to ignore conflict or other cues related to self-control, leading to reduced self-control in subsequent tasks. Conversely, ego attrition increases the individual's attention to behavioural cues with converging motivations, suggesting that ego attrition shifts attention from self-control to self-gratification. In other words, there is a shift from “have to motivation” to “want to motivation”.

2.3 Motivation Intensity Theory (MIT)

Also based on limited resource theory and process models, the need for individuals to conserve resources occurs when they are depleted. Studies have shown that individuals in the attrition group persist for shorter periods of time than those in the control group. Motivational intensity theory provides a powerful perspective when in the midst of a task with a rewarding stimulus. Motivational intensity theory views effort as a mechanism for mobilising energy, and this process of effort aims to maximise energy utilisation, that is, to maximise the use of energy stores. There are two central ideas in motivational intensity theory: (1) Effort (motivational intensity) should be proportional to the perceived difficulty of a problem challenge, as long as success is perceived as possible and valuable. (2) When success is perceived as impossible or difficult, the level of effort exerted is lower, and the importance of meeting the challenge is then used as the main reference (i.e. the value of the benefit generated). This suggests that compensatory effort can be generated when individuals feel that success is possible and worthwhile. Motivational intensity theory suggests that individuals automatically conserve energy in their behaviour and limit the level of effort to the minimum required for task success. As the task becomes more difficult, more effort is expended to meet the conditions required for success. However, when individuals realise that the cost of the effort exerted is higher than the reward from completing the task, they will stop trying accordingly [12].

3. Elicitation of self-loss

Ego attrition has been studied primarily using a dual-task paradigm, which requires participants to complete two consecutive tasks. The attrition condition first performs a self-control task, whereas the control condition performs a task that is less consuming of self-control resources. There are many tasks related to ego attrition, including the classic Stroop task, attentional control tasks, E-crossing tasks, emotional video tasks, thought suppression, transcription tasks, working memory tasks and many more. One of the most commonly used tasks is the colour-word Stroop task, which is a classic task that induces ego attrition and includes both colour-word incongruence (low attrition) and colour-word incongruence (high attrition). The longer the duration of the Stroop task, the worse the
performance on the subsequent self-control task. In the E-crossing task the attrition group was tasked with combing through the selected text and crossing out any position of the letter E, but not when the letter e was next to another vowel or when a letter was separated from another vowel, thus overriding the automatic response and exerting self-regulatory resources. White bear (white bear task), were asked to avoid thinking of a white bear at all costs, inhibiting their thoughts of a white bear for 5 minutes. Thoughts of a white bear, while those in the control state solved moderately difficult mathematical problems within 5 minutes. Participants in the transcription task were asked to transcribe a passage discussing the history of the city of Mannheim, Germany. No further instructions were given in the no attrition condition. In the attrition condition, participants were further instructed to transcribe the text, but to skip any instances of the letters e and n (for example, "Mannheim” had to be written as “Mahim”). These letters are the most commonly used letters in German, so participants had to suppress their familiar writing habits in order to complete the task correctly. Writing is habitual and automatic for adults. Therefore, in order to skip the letters that were forbidden, they had to monitor their writing and suppress all impulses to write as soon as they came up. This method has been shown to be effective in previous work; emotional video tasks, where the attrition group watches a sad video but needs to suppress their sadness and then complete the task in question, distraction tasks where some studies give participants a task such as arithmetic with an auditory disturbance given as a distracting stimulus, or attempts to record in their minds while receiving an external stimulus a video of the interview.

4. Conclusion

Ego depletion is considered to be the process of energy depletion, i.e. the process by which an individual's self-activity leads to a depletion of psychological energy resulting in a decrease in executive functioning. After ego depletion, there is a tendency for positive emotions to decrease and negative emotions to increase due to a lack of self-control resources, and for individuals to increase reactive aggression without significant changes in proactive aggressive behaviour. In this paper, the concept of ego depletion is explained and three theoretical models of ego depletion are introduced in order to provide inspiration for subsequent research and to better conduct basic research on the subject.

References


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