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Motivated creativity: A conservation of energy approach

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Summary

When making a financial investment, one can consider the chance of a company flourishing and growing and giving a great return on the investment, or the risk of the company failing and losing one's investment. When deciding what to study after finishing high school, one can consider how interesting the topic of a particular study is and how fun the jobs are that the study prepares for, or how difficult the study is and how unlikely it is to get a job afterwards. When searching for a nice date, one can focus on finding someone with great qualities, or on avoiding people with negative qualities. These examples show how people sometimes strive to achieve success or positive outcomes and at other times strive to avoid failure or negative outcomes.

Does it matter which goals people strive for? Does striving for success lead to better performance than striving to avoid failure? Does striving for positive or avoiding negative outcomes improve performance on different types of tasks? How does working under pressure influence people striving for these different types of goals? Is goal-striving more difficult when striving to avoid negative outcomes than when striving for positive outcomes? This dissertation addresses these and related questions, and advocates a novel conservation of energy principle to explain when striving for positive outcomes (approach motivation) and striving to avoid negative outcomes (avoidance motivation) stimulate performance. This principle is based on the idea that people are reluctant to invest energy, unless the benefits of this investment outweigh the costs. Further, when people do decide to invest energy and exert effort, this leads to depletion

Based on this principle, we predict that performance under avoidance motivation is more fragile and can be undermined easier than performance under approach motivation, because performance under avoidance motivation relies more heavily on the recruitment of cognitive resources and cognitive control. Or, as put by Johan Crujff, who used to be one of the greatest soccer players in the world and is known for his philosophical and often oracular one-liners; "Het is veel makkelijker om goed te spelen dan om te voorkomen dat je slecht speelt" (*It is much easier to play well than to prevent playing badly*; Winsemius, 2012).

Conservation of Energy

The conservation of energy principle builds on research showing that, compared to approach motivation, avoidance motivation evokes a systematic and persistent cognitive processing style, and leads to heightened cognitive control (Friedman & Elliot,

2008; Friedman & Förster, 2002; Koch et al., 2008; Miron-Spektor et al., 2011). The principle is based on three assumptions: (1) performance under avoidance motivation relies more heavily on the recruitment and availability of cognitive resources than performance under approach motivation, making (2) performance under avoidance motivation relatively demanding, and (3) people reluctant to spend their energy and resources unless the benefits of these investments outweigh the costs.

The conservation of energy principle was developed fully in Chapter 2, which put forward three propositions derived from this principle. Specifically, Chapter 2 proposed that compared to approach motivated people, avoidance motivated people (1) carefully select situations in which they exert such cognitive effort, (2) perform well in the absence of distracters that occupy cognitive resources, and (3) become depleted after exerting such cognitive effort. Although these core propositions are likely to operate in different types of tasks, the differential effects of approach versus avoidance motivation can be expected to become manifest especially in those tasks that are ill-suited for avoidance motivated individuals. One particularly relevant class of tasks are those related to creativity.

Investing in Creativity

Chapter 3 systematically examines the effects of approach and avoidance motivation on creative performance, and the consequences of such performance on depletion. This chapter tests the idea that approach motivation evokes a flexible processing style, and avoidance motivation a persistent processing style, and that both can result in equal levels of creative performance. Following the theoretical framework presented in Chapter 2, we hypothesized that avoidance-motivated individuals are not unable to be creative, but they have to compensate for their inflexible processing style by effortful and controlled processing.

Chapter 3 includes five experiments in which approach and avoidance motivation was evoked by framing instructions in terms of approach or avoidance (e.g., “Try to find as many words as possible” versus “Try to miss as few words as possible”), or by visual cues (i.e., a mouse trying to approach a piece of cheese versus a mouse trying to avoid being eaten by an owl). In each of these experiments, for half the participants creative performance did not serve goal progress, and for half the participants it did serve goal progress. We predicted that avoidance motivated people in particular should be stimulated to invest in creative activity when it served goal

progress, whereas approach motivated people, for whom creativity is relatively effortless, should always be relatively creative.

Results across the five experiments showed that approach motivated people outperformed avoidance motivated people on creative tasks when creativity did not serve goal progress. However, when creativity was useful, and served goal progress, both approach- and avoidance-motivated people were equally creative. For example, in Experiment 3.4, participants were asked to solve creative insight problems. When solving the problems did not help a mouse to get closer to a piece of cheese (or away from an owl), participants in the approach condition were more creative than those in the avoidance condition. However, when solving problems was useful, and helped the mouse to get closer to the cheese (or stay away from the owl) participants in the approach and avoidance conditions solved the same amount of creative insight problems. It thus appears that avoidance-motivated people were reluctant to exert effort and invest energy necessary for creative performance, unless creativity served their (avoidance) goals.

Furthermore, according to the conservation of energy principle, people should be more easily cognitively overloaded when they are avoidance rather than approach motivated when faced with resource-consuming distracters. Indeed, the results of Experiment 3.4 showed that when people were avoidance motivated, their creative performance was undermined more by working under a high cognitive load (i.e., memorizing 5-digit numbers while solving creative insight problems) than when they were approach motivated. Finally, if performance of avoidance motivated people depends more on recruitment of cognitive resources and control, creative performance should be more depleting for avoidance than approach motivated people. As expected, Experiments 3.2a, 3.2b, and 3.3 all showed that avoidance motivated participants felt more depleted after performing creatively than approach motivated participants.

Working under Time Pressure

From the conservation of energy principle it follows that when cognitive resources are taxed or otherwise unavailable, avoidance motivated individuals should perform less well than those who are approach motivated. Chapter 4 tested this proposition by having participants working under low versus high time pressure. Five experiments examined the effects of working under time pressure on performance on a variety of cognitive tasks, including those well suited and those ill suited to the type of information processing evoked by avoidance motivation. These tasks included solving

creative insight problems, solving mathematical problems, and identifying target figures among visually similar distracter figures.

Experiment 4.1 focused on individual differences in the tendency to strive for avoidance goals (i.e., avoidance temperament, Elliot & Thrash, 2002; 2010), and showed that the higher people's avoidance temperament was, the more performance on a creative insight task was inhibited by working under a high time pressure. Experiments 4.2 and 4.3 focused on situations in which approach versus avoidance motivation were manipulated within participants, with a task in which they could win points for correct answers on some items and lose points for incorrect answers on other items. These experiments showed a stronger undermining effect of working under a high time pressure under avoidance rather than approach motivation, both for creative insight performance and for analytical performance (i.e., an arithmetic test). Finally, in Experiments 4.4 and 4.5 motivational orientation was manipulated between participants. In Experiment 4.4 participants were asked to write a story from the perspective of a mouse about its efforts to obtain a piece of cheese, or to avoid being eaten by an owl. After writing the story, the participants completed a task that strongly relies on attention to detail, in which they had to locate specific targets among similar looking distracters. Also detail oriented task performance was undermined more by working under a high time pressure when people were avoidance motivated than when they were approach motivated.

This chapter showed that performance is particularly undermined by time pressure when people are avoidance motivated. Performance under avoidance motivation relies more heavily on cognitive control and the availability of cognitive resources than approach motivation. We did not find evidence that stress-related emotions were responsible for the observed undermining effect, but did find evidence that the effect was produced by reduced availability of cognitive resources (Experiment 4.5). The results suggest that avoidance motivation is fragile and costly, and is best used (and encouraged) sparingly.

Evaluating Performance: Outcomes Versus Processes

In the chapters of this dissertation devoted to the conservation of energy principle (Chapters 2-4), we found evidence that people can achieve the same outcomes when they are avoidance motivated as when they are approach motivated, on tasks requiring creative, analytical, and detail oriented performance. However, whereas focusing on outcomes is generally accepted as a good indicator of performance for

analytical, and detail oriented tasks, this is not uniformly the case for creative tasks. When evaluating creativity, people tend to take into account not only the outcomes, but also the processes that led to the outcomes. In Chapter 5 we developed the idea that the same creative product can be evaluated quite differently depending on whether it was achieved through persistent and systematic thinking (as is more likely when people are avoidance motivated) compared with more flexible and associative thinking (as is more likely when people are approach motivated). Specifically, we reasoned that when people in hindsight can understand how an idea or product came about, they are less impressed by the idea or product.

The effect that people in hindsight feel that they would have predicted that a certain outcome would occur (after learning about both the events leading up to a certain outcome, and the outcome itself), has been aptly labeled the “knew it all along effect” (Fischhoff, 1975; 1977; Hawkins & Hastie, 1990). Chapter 5 proposed that ideas which are generated through a flexible way of thinking or sudden insights are surprising and seem to come ‘out of the blue’. When the exact same ideas are generated through a persistent and systematic way of thinking, it is easier to follow the reasoning and understand how someone came up with the ideas. In turn, this may make the idea seem more obvious and unsurprising, and therefore less creative.

Results of three experiments supported this “knew-it-all-along” effect in creativity judgments. For example, in Experiment 5.3 participants were asked to evaluate an idea that was generated by another participant during an individual brainstorm session in which ideas to protect the environment were typed into a computer for eight minutes (Experiment 3.1). Before the target idea that was to be judged appeared on the screen, the five preceding ideas were presented one by one. The ideas either reflected a flexible way of thinking (i.e., ideas in many different categories—aimed at achieving many different types of environmental goals), or a structured way of thinking (i.e., many ideas within few categories—aimed at achieving only a few different environmental goals). Results showed that people took into account the process through which the outcome came about when judging its creativity. The exact same idea was evaluated as less creative when it resulted from a structured process than when it resulted from a flexible process.

Conclusion

This dissertation developed a novel conservation of energy principle to explain how approach and avoidance motivation influence performance. On the one hand, we showed that avoidance motivated people can excel when they are sufficiently stimulated to invest their energy and cognitive resources. This is the case, for example, when this investment is likely to result in successful avoidance of failure. Even when performance depends on creativity and insight, such stimulation can lead to high levels of performance. Usually creativity and insight are associated with the flexible and associative way of thinking evoked by approach motivation. However, by investing energy and cognitive resources avoidance motivated people can compensate for their systematic and controlled way of thinking, and achieve the same levels of creative performance as approach motivated people.

On the other hand, it appears that Johan Cruijff was onto something when he noted that it is much easier to play well than to prevent playing badly. Although avoidance motivation may be effective in short-term projects due to the recruitment of cognitive resources and control, it may be counterproductive in the long run, when energy gets depleted and people feel mentally exhausted. Even in the short run negative effects of avoidance goal striving may emerge, because it makes people more prone to cognitive overload when facing distracters or stressors. This dissertation shows that performance under avoidance motivation can be effective, but is difficult, depleting, and easily undermined.