



# Emotional see-saw affects rationality of decision-making: Evidence for metacognitive impairments

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## ABSTRACT

This research investigated the cognitive mechanisms that underlie impairments in human reasoning triggered by the emotional see-saw technique. It has previously been stated that such manipulation is effective as it presumably induces a mindless state and cognitive deficits in compliant individuals. Based on the dual-system architecture of reasoning (system 2) and affective decision-making (system 1), we challenged the previous theoretical account by indicating that the main source of compliance is impairment of the meta-reasoning system when rapid affective changes occur. To examine this hypothesis, we manipulated affective feelings (system 1 processing) by violating participants' expectations regarding reward and performance in a go/no-go task in which individuals were to inhibit their responses to earn money. Aside from the go/no-go performance, we measured rationality (meta-reasoning system 2) in decision-making by asking participants to comply with a nonsensical request. We found that participants who were exposed to meta-reasoning impairments due to the emotional see-saw phenomenon exhibited mindless behavior.

## 1. Introduction

There are many daily life situations in which we fall in a certain emotional state that subsides quickly, leading us to make irrational decisions. Let us imagine a college student who is anxiously waiting for information whether she has passed a very difficult exam. By chance, shortly after getting the good news, a telemarketer calls her and she agrees to invite a kitchenware salesman to her apartment. Obviously, this is a nonsensical decision as she does not like cooking at all! Indeed, it is important to ask a question here: how does such sudden withdrawal of emotions make an individual's behavior mindless when confronted with the requests or demands of others?

According to research on social influence (Doliński, Ciszek, Godlewski, & Zawadzki, 2002; Doliński & Nawrat, 1998; Doliński & Szczucka, 2012, 2013), such situations represent typical fear-then-relief conditions which most likely induce compliant behavior that may in turn lead participants to do things against their own will. Doliński and Nawrat (1998) conducted a series of experiments yielding such outcomes, since participants for whom the fear-then-relief procedure was applied seemed to comply more often than those from the control groups. For instance, in one study (Doliński & Nawrat, 1998) the experimenters placed a card looking like a parking ticket that was either

an advertisement or a drive for blood donation behind the wipers or on the door of a parked car. As a result, drivers who noticed the card behind the wipers of their car were more willing to fill out a questionnaire regarding road traffic than drivers who did not undergo any manipulation, or received a note attached to the car door.

In addition, Nawrat and Doliński (2007) argued that the sudden withdrawal of a positive emotion can induce compliance, especially when a happiness-then-disappointment procedure was applied to participants. For instance, in one of their studies, participants in the experimental group found a small piece of paper on the street that looked like a real banknote. After picking it up, they discovered that it was a banknote-like advertisement for a new car wash. In the control group there was no exposure to this fake banknote. Then, all participants were asked by an experimenter's accomplice to help her carry a heavy bag to the fifth floor. As in previous experiments, the researchers demonstrated that participants who experienced a rapid change in their emotional state were more compliant. In another study conducted by Nawrat and Doliński (2007), the experimenter telephoned people introducing herself as an employee of Polish Telecom. In some of the experimental conditions, she informed the callee that the computer had calculated an overpayment in his or her account and he or she would soon receive a refund. Other participants were informed that the

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computer had calculated a considerable overdue sum of money to be paid back by the participant. Regardless of the type of manipulation, participants were then told that it was a mistake, because the computer had just identified another customer with the same name, but a different address. Subsequently, the experimenter said, “Polish Telecom is currently testing the capacity of the telephone lines. In relation to the introduction of the TELPOCOL system, I would like you to switch the telephone receiver from one ear to the other”. In the control group where no emotional state was induced, this nonsense message was presented right after the experimenter introduced herself as an employee of Polish Telecom. Participants' confirmation that they had switched the receiver to their other ear was treated as mindless compliance to a nonsense request. While this behavior only sporadically occurred in the control group, it was considerably more common in the emotional see-saw conditions.

This suggests that the valence of the initial emotion does not matter in terms of the effectiveness of this social influence technique. However, what is crucial for generating compliance is to trigger sudden withdrawals of either positive or negative affect. For this reason, Nawrat and Dolinski (2007) proposed the term “emotional see-saw” (referring to the common children's playground apparatus that makes children go up and down) to describe these phenomena.

The question arises why people are more prone to complying under a sudden and unexpected withdrawal of affective states? It is commonly assumed that the central core of any particular emotion is a change of action readiness (e.g. Frijda, 1986; Jenkins & Oatley, 1996). Every emotion we experience launches a specific action program uniquely designed for this affective state. In most cases (especially in our evolutionary past) the programs were and still are adequate and adaptive. However, in a particular emotional see-saw situation, the action program launched by the initial emotion ceases to be adequate for the changed circumstances. Before a new and more adequate program is initiated, there is a very specific state of a “break between programs”. One program has just been suspended, and a new program suitable for the new situation has not yet been commenced. Participants' cognitive efforts attempt to block the current actions induced by the terminated stimulation, thus limiting cognitive resources (Dolinski, 2001, 2007, 2016). One may assume that at this moment people are disoriented and their functioning is automatic and mindless. As Langer (1992) suggested, a state of mindlessness results in diminished conscious awareness and a sort of impairment of executive function, leading to reduced ability to update categories or distinctions. In addition, people acting mindlessly exhibit rigid thinking, tend to ignore novelty in certain situations, and oversee many alternative options. Moreover, mindlessness might be triggered very quickly after short exposure to some particular information, making people very rigid in the way they process it.

Indeed, Dolinski et al. (2002) successfully provided empirical data supporting this line of reasoning. In one of their studies, a state of fear was induced in participants by informing them that they would receive an electric shock as a part of the experiment they would take part in. One group was left with this information in order to experience continuous fear; the other group was informed that due to some changes in the laboratory they would take part in a different experiment in which they would throw darts, and electric shocks were not planned. The third (control) group participants were told from the beginning that they would throw darts. It was shown that the experimental group participants who were exposed to a fear-then-relief procedure scored lower in solving arithmetical equations than the fear group and the control group (Dolinski et al., 2002). Clearly, it seems that the emotional see-saw condition is more likely to lead to cognitive deficits. Hence, it is plausible that mindlessness and compliant behavior are closely related as they deal with deficits in higher-order cognitive functioning when affective manipulation is applied. We will attempt to explain this idea in the following paragraphs.

According to Fletcher and Carruthers (2012), mature humans possess adaptive meta-reasoning functions that guide behavior with respect

to targets in their own first-order activity. These researchers postulate that a dual-processes or dual-system architecture is engaged in human reasoning (Fletcher & Carruthers, 2012). In particular, system 1 constitutes automatic and unconscious processes that are universal among people. In addition, system 1 processing can provide intuitive judgments and decisions in response to perceptual inputs. Moreover, system 1 is overridden by system 2 reasoning, which is always rational, conscious, and has reflective character. System 2 meta-reasoning proceeds slowly in a serial manner, and is in fact heavily influenced by individual and cultural learning. Because system 2 reasoning is superior, it is believed to intentionally displace, modulate or suppress system 1 processing. One therefore expects that system 2 reasoning fails to monitor the rationality of intuitive judgments and decisions when system 1 is compromised by sudden affect withdrawals.

Given the dual-system architecture of human reasoning, how can affective decision-making be examined in a laboratory? Fletcher and Carruthers (2012) argue that system 1 can often be driven by misleading cues, thus leading to non-optimal decisions and judgments. In this situation, because system 1 processing is a sort of “black box”, in order to initiate appropriate rational strategies or actions, system 2 reasoning attempts to manipulate the input of system 1 by ignoring or suppressing non-informative outputs from it. For instance, if participants are tempted to do forbidden things (e.g., swearing), reflective reasoning from system 2 attempts to resist affective feelings issued by system 1 processing (Fletcher & Carruthers, 2012), such as immediate emotional reactions or cognition. In fact, we can observe such performance in a typical go/no-go experiment. Under such experimental conditions, participants in no-go trials are required to withhold a response to certain stimuli (see for instance: Menon, Adelman, White, Glover, & Reiss, 2001; Szczepanowski, Folwarczny, Król, Doliński, & Budzisz, 2017). More importantly, because the go/no-go task requires participants to inhibit their responses to a proponent stimulus that is not relevant, they often make mistakes by following such irrelevant cues (Fernandez-Duque, Baird, & Posner, 2000). Since error making conflicts with a participant's goal in the task, meta-reasoning begins to monitor and control system 1 processing to optimize performance. However, one can also observe ineffective patterns of the interaction between both systems in such cognitively demanding tasks. For instance, if meta-reasoning is continuously compromised by numerous misleading cues from system 1 processing, its struggle to satisfy desired standards of rationality by redirecting or suspending system 1 activity may fail. This, in turn, may lead to more delayed cognitive reflections and mindless behavior as an outcome.

With regard to such a dual-process view on rationality and decision-making, one can expect that the emotional see-saw can compromise system 1 affective processing and make switching to the controlled and reflective system 2 ineffective. Let us imagine a participant told to perform a go/no-go task who is promised real money in return for performance. After each response, the participant is presented with encouraging or discouraging feedback on the screen (for instance, a “+10” or “10”, respectively). In this experimental situation, the encouraging feedback may be used by cognitive reflection in system 2 as a cue that system 1 is performing well (e.g., system 1 issues immediate positive feelings about task performance) and that the expected reward will be high. On the other hand, presentation of discouraging cues could be a sign of unsuccessful performance and low reward (negative feelings). Hence, one can expect that the presentation of reward information that is contrary to what is expected could rapidly alter subjective feelings issuing from system 1 to an opposite affective state. Since no swift adjustments of system 1 are possible under this manipulation, the rational adequacy of system 2 is compromised, resulting in more delayed reflections and mindless compliant behavior.

In the present study, we employed a go/no-go task in which participants were exposed to sudden affect withdrawals by violating their expectations regarding performance and reward. We assumed that participants from the negative emotional see-saw group exposed to

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