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Research Dialogue

Refining the dual-process theory of preference construction: A reply to Gawronski, Martin and Sloman, Stanovich, and Wegener and Chien

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Abstract: Our target article proposed a dual-system framework for understanding context and task effects in choice. In this summary, we address the major points made by each set of commentators and, building on their suggestions, define a more precise dual-system theory of preference construction. We also propose some avenues for future research on a broader dual-system approach to understanding choice.

Keywords: Preference construction; Dual-process; Dual system; Context effects; Choice

Introduction

The primary purpose of our target article in this research dialogue was to foster a conversation among researchers in cognition, reasoning, heuristics, attitudes, and behavioral decision theory. We wrote the dialogue with the goal of noting that there remain many important missing links in our understanding of the processes that underlie preference construction in choice, which require further theory building and empirical support. We are delighted that four excellent commentaries have generated useful suggestions for refining our theory and have enhanced it by integrating the theory with other dual-process theories. In this response, we discuss the key observations raised by each set of commentators, clarify some misconceptions, and build on the commentators' suggestions to more precisely define the dual-system theory of choice. We also propose some future research directions for the study of choice. Our main objective in this research dialogue was to convey our enthusiasm for the important questions that remain unanswered in the study of choice, and we feel that the four commentaries echo this sentiment.

Gawronski

While Gawronski acknowledges that our dual-system framework of choice has integrative value due to the way it encompasses many preference construction effects, he identifies some conceptual concerns and suggests how they can be resolved by more precise theorizing about the mental processes involved. Gawronski argues that the framework fails to specify the operating principles, or mental operations, involved in preference construction. This limitation, he argues, makes the model less useful as a way of categorizing choice effects. He proposes processes from the associative-propositional evaluation (APE) model as a way to specify operating principles and make the model more complete.

We agree with Gawronski that it is useful to understand the mental processes underlying each system in order to make the framework more precise. Gawronski draws a distinction between operating principles (distinct processes underlying System I and System II) and operating conditions (conditions under which the two distinct processes operate) and states that our framework is imprecise about operating principles. While describing the operating principles of System I and System II was not the primary focus of the article, we did briefly define the mental processes by drawing on Evans & Stanovich, 2013. We argued that System I processes are the workings of associative memory, which automatically happen to the decision maker and do not tax working memory. System II,

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on the other hand, comprises all thoughtful, deliberate, and willful processing, and its hallmark is the engagement of working memory. However, the exact mental processes for two systems are difficult to specify precisely because the two systems likely encompass many different cognitive processes. We agree that we could have emphasized operating principles more in the target article and that it would be useful in the future to closely consider the mental processes involved in choice.

We also agree with Gawronski that associative and propositional processes from the APE model are good candidates for operating principles because they are well-aligned with our conceptualization of the processes underlying System I and System II. In the APE model, affective reactions and evaluative judgments are the outcomes of two distinct processes: affective reactions are the output of associative processes, which are defined as the activation of associations in memory on the basis of feature similarity, whereas evaluative judgments are the outcomes of propositional processes, which are defined as the validation of momentarily activated information on the basis of logical consistency (Gawronski & Bodenhausen, 2011). One refinement we now introduce to System I is acknowledging that affective reactions are the output of System I processing. We therefore believe that associative processes from the APE model map on well to System I processes. Similarly, propositional processes map on to System II processes because both evaluate and validate inputs from associative processes.

However, there are a few key differences between the models. In the APE model, propositional processes not only evaluate activated associations, but may also create new associations, thereby changing the nature of affective processes. Second, there is no one-to-one mapping between the two kinds of processes and automaticity. Gawronski and Bodenhausen (2011) argue that associative processes can sometimes be intended and controlled, while propositional processes can be uncontrollable and can operate unintentionally, outside of awareness, and even without taxing cognitive resources. These differences motivate important future directions for the refinement of our model: further exploring the nature of the relationship between System I and II — specifically, considering whether the relationship may be bidirectional — and considering how the principles of automaticity map on to the two systems.

Gawronski notes that "choice decisions are never the product of a single process," but always involve both intuitive and deliberate processes which "do not operate in isolation, but mutually interact with each other," whereas he perceives our dual-system theory to allow for only one of the systems to act at a time to create an effect. Although we classified certain effects as being rooted primarily in System I or System II processing, we agree that choice decisions are always the product of both processes and did not mean that they operate in isolation. System II processing is always active to some extent, although decision makers can exert more or less effort in processing information. When we say that an effect is primarily "due to System I" that means that the intuitive system generated a strong preference from one of the options because the affective response to that option was stronger than to the others, making it stand out, and that System II approved the response. It does not mean that decision makers are not engaging in System II processing. On the other hand, when we say an effect is "due to System II" that means that the pattern of responding occurred consciously and taxed working memory such that conscious, deliberate processing played a larger role in generating that response because none of the activated associations generated a strong preference in favor of one of the options.

In our target article, we did purposefully focus on examples of choice effects where either System I or System II has a disproportionate influence on the resulting preference in order to illustrate the extreme cases where System I or System II is primarily responsible for generating a preference. While we focus on these extreme examples, we recognize that both systems are always active and that most choices involve the interplay of the two systems.

Finally, we respectfully disagree with Gawronski's points that a) operating conditions are not useful for defining System I and System II and merely make our theory circular and that b) "if any predictions about moderating effects of elaboration were disconfirmed, the consequence would be a simple recategorization of the effect." We believe that operating conditions are useful for defining System I and System II because they provide insight into the mechanism, or operating principles, underlying the systems. Understanding operating conditions is useful because often we cannot directly observe mental processes that generate a decision. However, we can make falsifiable predictions about how a decision may change under different operating conditions (e.g. time pressure or load), and we can conduct experiments to test those predictions. This way, we can make inferences about the underlying process based on the observed outputs.

We argue that a recategorization of an effect based on a time pressure or load finding would be useful and would not be merely circular because the System I and II labels are shorthand for both the kind of processing in which the decision maker is engaging and the conditions under which we should see different patterns of choices. If a pattern of choice that was previously thought to require concentration and deliberation turns out to increase under load or depleted resources, that would provide evidence that in fact that pattern is likely operating at the level of activated associations in working memory with little effort.

Overall, we agree with Gawronski that there are clear parallels between our dual-system model of choice and the APE model. We also agree that thinking about the mental operations involved in preference construction is an important pursuit that would allow us to develop a more comprehensive theory capable of making more powerful predictions. Next, we consider Wegener and Chien, who took a similar approach and also drew parallels between our dual-process theory of choice and the Elaboration Likelihood Model (ELM).

Wegener and Chien

Wegener and Chien correctly point out that the literature on evaluative processes in social psychology is highly relevant to theories of choice because evaluating each option in a choice set plays a key role in making a choice. We agree with Wegener