Beyond Dual-Process Models: Toward a Flexible Regulation System

Fritz Strack
Department of Psychology
University of Würzburg

Progress in scientific explanations requires distinctions. To show that the same outcome may be generated by several processes allows for a more differentiated understanding of a phenomenon, increases a theory's predictive power, and may reveal that, after all, the outcomes differ on important dimensions.

Models of information processing that invoke the operation of more than one mechanism have contributed to such deeper understanding. Interestingly, most of them did not go beyond the number two. In fact, a substantial quantity of dual-process models have been suggested to describe various psychological phenomena (for a recent collection, see Chaiken & Trope, in press).

In the domain or attitudinal persuasion, Petty and Cacioppo (1986) suggested that recipients may adopt either a "central" or a "peripheral" route in processing persuasive information. At the same time Chaiken and Eagly (Chaiken, 1987; Eagly & Chaiken, 1993) proposed that such information may be processed either in a "systematic" or in a "heuristic" fashion. Both notions are influenced by Tversky and Kahneman's (e.g., 1974) seminal work on judgments under uncertainty in which it was demonstrated that complicated tasks are often simplified by the use of rough rules of thumb that often result in judgmental distortions. These researchers claimed that there exist two ways of solving a mental task: A normatively appropriate procedure that would yield an accurate outcome and a "quick and dirty" procedure that would not always, but frequently lead to faulty results.

The dual-process models of persuasion imply a similar dichotomy. On the one hand, there is an appropriate strategy that requires some effort but leads to accurate, well-founded, and stable attitudinal judgments. Alternatively, there exists a less effortful processing that is inferior on these dimensions. It should be noted that these dual-process models go beyond Tversky and Kahneman's initial notions in that they specify conditions and consequences. In particular, they describe the circumstances under which people engage in more elaborate processing and under which they take shortcuts. Many parameters of competence, motivation, and situational influences were identified and experimentally tested. In addition, the results of the two modes of processing were systematically investigated. Thus, the dual-process models of persuasion have greatly enriched our understanding of judgments under uncertainty and it seems somewhat surprising that these findings have not had more impact on research in the domain of heuristics and biases.

More important, of course, these conceptualizations have shaped current research on attitudes and persuasion. As aptly described by Kruglanski and Thompson, the Elaboration Likelihood Model (ELM) and the Heu-

ristic Systematic Model (HSM) have become household words for students of attitude change and, most important, a myriad of phenomena in the attitude domain can be better understood by pointing at different ways of information processing.

After such a remarkable success story, have the dual-processing models of persuasion had their heyday? This is certainly the implication of the target article with which I tend to agree. I am inclined to agree with Kruglanski and Thompson's arguments and, instead of reiterating them, I would like to add some of my own and go beyond the suggested alternative of a unimodel.

In my understanding, the processes as they are suggested by Chaiken, Eagly, Petty, Cacioppo, and their colleagues are a bit like fixed and somewhat rigid operating systems that are activated under different circumstances. For example, recipients who are highly involved are assumed to use a different procedure to process relevant information compared to recipients who are not involved. Similarly, people who are distracted or under time pressure will use a different operating system. In both conceptualizations, the superior process (i.e., the central route in the ELM and the systematic mode in the HSM) is based on arguments (or "central cues") and the inferior process (i.e., the peripheral route or the heuristic mode) is based on ("peripheral") cues. Argument- and cue-based processes are qualitatively different and are not meant to operate in parallel, although fast switches are considered to be possible (Eagly & Chaiken, 1993). To some degree, the two processes seem like "mind sets" (Gollwitzer, 1990) that are elicited by internal or external prompts. For reasons of mental stability, however, an oscillation of such states does not seem to be a plausible assumption.

Kruglanski and Thompson argue that the assumption of two mutually exclusive processes does not do justice to the multifaceted phenomenon of attitudinal persuasion. Because cues and arguments are characteristics of the stimulus *content* but not unequivocally related to a particular psychological *process*, a theoretical distinction between them does not seem meaningful. In their review of the literature, Kruglanski and Thompson found that the processing of cues (e.g., determining the expert status of the persuader) was always easier than the processing of arguments. If, however, the obtained differences are due to the ease of processing, this should be independent of the content and apply to both cues and arguments. As a logical consequence, they conducted a series of studies in which it was difficult to decide whether the communicator was an expert or not. Sure enough, variables that were previously found to affect the processing of arguments (like involvement, distraction, cognitive load) were now demonstrated to influence the processing of cues. That is, the psychological difference between cues and arguments hinged on a third variable that is not inextricably tied to one or the other, but may be associated with both. Moreover, the present authors argue that in principle, cues and arguments do not differ with respect to other characteristics like relevance for inferences, accessibility, or complexity and that these attributes were, in fact, differentially connected with arguments versus cues depending on the idiosyncrasies of the various studies.

Thus, the dual-process models of persuasion seem to be afflicted with two problems: their rigidity and the fact that process variables that are not genuinely tied to a particular type of content may better account for the empirical findings. If it is possible, as Kruglanski and Thompson have argued, to explain the effects by merely invoking general principles of information processing, reasons of parsimony and theoretical integration invite a unified model of attitudinal persuasion. In a sense, Kruglanski and Thompson's suggestion implies that the first steps Petty, Cacioppo, Chaiken, and Eagly used to specify conditions and consequences for heuristic processes should be extended by embedding their basic reasoning into a general model of information processing.

I would like to focus on the second problem associated with dual-process models of persuasion. Although these models deserve great credit for pointing at the variance in the processing of persuasive information, a dichotomy may just not be fine grained enough. The idea that the person's mind is set such that it operates either in a systematic or in a heuristic manner is provocative but may not be able to capture the multitude of ways in which information may be processed. The price for being able to accommodate these complexities within the limits of dual-process models would be the assumption of rapid changes between the states. Such an oscillation, however, seems problematic with respect to the idea of a state and a minimum of mental stability that seems to be a prerequisite of psychological functioning.

As an alternative, one might consider a more flexible regulation system. Such a system would have to take people's processing goals and their self-knowledge into account. In particular, when people encounter a persuasive message, it may be met with different processing goals and various degrees of interest. A person is exposed to the content of a message and may want to either form or confirm an opinion. This activity may vary in intensity and may be impeded by the difficulty of the task in its situational context.

To simplify things, let us concentrate on the case where the recipient has a strong or a weak goal of gaining an accurate opinion, while characteristics of the task facilitate or impede the attainment of this goal. As a reference point, consider the situation in which a person is strongly motivated and can operate under optimal and unrestricted circumstances. As a deviation from this control condition, assume that people may still be motivated to form an accurate opinion but are placed into an adverse context. Here, a conflict may

arise between the accuracy of the judgment and the speed with which it has to be performed (see also Kruglanski, 1989). To reach the same criterion of accuracy, extra resources must be released to overcome the situational obstacles. For example, attentional efforts may be increased. In addition, the person may attempt to allocate his or her resources more economically. That is, for aspects that are deemed less important, he or she may adopt quick-and-dirty procedures or retrieve schematic knowledge from memory. The degree to which the person engages in simplifications in judgment formation depends on the strictness of the accuracy criterion on the one hand and the task difficulty on the other (e.g., Bodenhausen, 1988).

Of course, the picture turns more complicated if the second processing goal comes into play; that is, when people have a need to reach certain predetermined conclusions that are consistent with more general values. Although accuracy and confirmation goals may be in conflict, they may both determine the processing of persuasive information. For example, if there are no task constraints, a conflict between the two goals may result in more intensive processing to justify confirmatory inferences. Under task constraints, simplifying strategies that are in the service of the confirmation goal (e.g., the use of schematic information) may resolve the conflict. Again, the strength of the goals and the quality of the situation may determine the various ways in which the information is processed. To complicate things, goals may not simply be turned on or off. Rather, individuals' attention may shift between desired end states. In fact, this may be necessary to optimize an outcome if several goals have to be served.

Obviously, it is possible to come up with a more differentiated analysis of the persuasion situation. However, even this fundamental classification suggests that the different types of processing may change rapidly as a function of people's attention. Moreover, different types of processing may be combined to be successful in certain constellations. If this is the case, it is difficult to understand variations in processing as changes of states or mind sets. Rather, such variations seem to be embedded in the superordinate task and may occur whenever it is useful. This is particularly obvious for the use of schemata that seem to be a special case of judgmental heuristics (particularly in the case of stereotypes). Their role in recognition is a particularly striking example. There, recollective experiences and schema-guided inferences go hand in hand and contribute interactively to the required decision (Bartlett, 1932). Also, it should be noted that suboptimal processing conditions do not only lead to simplifications. A more deliberate allocation of resources may imply an increased concentration on some aspects, at the expense of a simplified treatment of others.

If one deviates from the notion that the two types of information processing operate like mind sets, one may try to identify the mechanisms on a more molecular level. What are the simplifying components of information processing? In the most general sense, they are all inferences that reduce time and effort. This criterion applies to which information is used and how it is used to draw inferences. For example, current affect allows to infer one's subjective well-being in a much simpler fashion than the integration of different features of one's life (Schwarz & Strack, 1991). Less effortful processing may also apply to arguments. For example, a person may merely determine if an argument is pro or con instead of extracting its more specific implications. Thus, as Kruglanski and Thompson have argued, whether the basis for an inference is an argument or a cue has no psychological implications with respect to the way it is processed. In a unified model of persuasive communication, people may chose different types of information depending on the speed or effort they require for processing. At the same time, the accuracy of the afforded inferences must be weighed and added to the equation.

A second device for simplifying information processing is stop rules. For example, when people draw inferences on the basis of global impressions, they may terminate the impression formation at an earlier time or at a relatively lax criterion. Again, this possibility is not limited to the processing of a certain type of material. For example, when listening to the presentation of an argument, we may decide to reach a conclusion at different stages, just as we may evaluate a global and more impressionistic attribute of a communicator.

To account for variations in the processing of persuasive communications, the assumption of a flexible regulation system may provide insights that transcend dual-processing models. Such a model would assume that human information processing is guided by one or more processing goals (Kruglanski, 1989) that may be simultaneously activated and differentially weighed. To implement these goals in a specific task context, individuals must apply knowledge of their own psychological functioning. This self-knowledge may be derived from general psychological principles. Alternatively, it may consist of beliefs about one's idiosyncratic functioning. In addition, a flexible regulation system needs a monitoring device that keeps track of the fulfillment of the activated goals and allocates energy to different goal-relevant activities and initiate judgmental corrections. Speculating about conscious and nonconscious components, conscious processing may be most likely to occur at the monitoring level.

Let us assume a recipient of a persuasive message who is highly involved in the issue wants to form an accurate opinion, but must operate under time pressure. In this situation, an extensive processing would prevent the generation of an opinion while an indiscriminate simplification would carry the risk of abandoning

accuracy. Thus, a prudent allocation of more and of less elaborate processing would be most likely to produce an optimal outcome. This requires that the person is aware of his or her strengths and weaknesses (e.g., Strack & Förster, 1998) and can assess the ease and difficulty of various tasks (e.g., Förster & Strack, 1998; Strack & Bless, 1994; Strack & Förster, 1995). In addition, he or she should know how to interpret his or her own feelings to draw the appropriate inferences. Although there are many more aspects of self-knowledge that may help regulate the processing of persuasive information, the importance of metacognition has become apparent not only for the guidance of learning (e.g., Nelson, Gerler, & Narens, 1984) but also for the regulation of judgments in a social context (Bless & Strack, 1998).

It seems that the variations in the processing of persuasive information are controlled by similar mechanisms. Moreover, such a view would allow the integration of judgmental corrections that play an important role in attitude formation (e.g., Strack & Hannover, 1966). That is, insufficient processing may be compensated by adjusting one's response in the opposite direction of a presumed influence. Alternatively, attention might be focused on uncontaminated information to recompute a judgment.

In summary, this proposition acknowledges Kruglanski and Thompson's criticisms of dual-process models in persuasive communication. Going beyond their findings and arguments, it is suggested to explain variations in the processing of persuasive information as part of a regulation system in which simplifying procedures are flexibly deployed. People's processing goals, their psychological self-knowledge, and a monitoring device that keeps track of the output are considered to be central components of such a system.

By going a further step toward a microlevel analysis of persuasion and adopting a regulatory perspective, the dynamics of variations in processing may be captured in a way that allows for the flexibility that characterizes our mental functioning. Dual-process models of persuasion deserve great merits in making clear that there exist different ways in which persuasive messages may be processed. Perhaps, their enormous success was partly due to the simplifying or "heuristic" nature of their analysis. They have provided an ample knowledge base that allows us now to move on to a more "systematic" inquiry into the persuasion process.

Notes

Work on this article was supported by a grant from the Deutsche Forschungsgemeinschaft (DFG).

Fritz Strack, Psychologie II, University of Würzburg, Roentgenring 10, D–9707, Würzburg, Germany.

References

Bartlett, F. C. (1932). *Remembering: A study in experimental and social psychology*. Cambridge, England: Cambridge University Press.

Bless, H., & Strack, F. (1998). Social influence on memory: Evidence and speculations. In V. Yzerbyt, G. Lories, & B. Dardenne (Eds.), *Metacognition: Cognitive and social dimensions* (pp. 90–106). London: Sage.

Bodenhausen, G. V. (1988). Stereotypic biases in social decision making and memory: Testing process models of sterotype use. *Journal of Personality and Social Psychology, 55,* 726–737.

Chaiken, S. (1987). The heuristic model of persuasion. In M. P. Zanna, J. M. Olson, & C. P. Herman (Eds.), *Social influence: The Ontario symposium* (Vol. 5, pp. 3–39). Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.

Chaiken, S., & Trope, Y. (Eds.). (in press). *Dual-process models in social psychology.* New York: Guilford.

Eagly, A. H., & Chaiken, S. (1993). *The psychology of attitudes.* Fort Worth, TX: Harcourt Brace Jovanovich.

Förster, J., & Strack, F. (1998). Subjective theories about encoding may influence recognition. Judgmental regulation in human memory. *Social Cognition, 16,* 78–92.

Gollwitzer, P. M. (1990). Action phases and mind-sets. In E. T. Higgins & R. M. Sorrentino (Eds.), *Handbook of motivation and social cognition: Foundations of social behavior* (Vol. 2, pp. 53–92). New York: Guilford.

Kruglanski, A. W. (1989). *Lay epistemics and human knowledge: Cognitive and motivational biases.* New York: Plenum.

Nelson, T. O., Gerler, D., & Narens, L. (1984). Accuracy of feeling-of-knowing judgments for predicting perceptual identification and relearning. *Journal of Experimental Psychology: General, 113,* 282–300.

Petty, R. E., & Cacioppo, J. T. (1986). The elaboration-likelihood model of persuasion. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 19, pp. 123–205). Orlando, FL: Academic.

Schwarz, N., & Strack, F. (1991). Evaluating one's life: A judgment model of subjective well-being. In F. Strack, M. Argyle, & N. Schwarz (Eds.), *Subjective well-being* (pp. 27–47). Oxford, England: Pergamon.

Strack, F., & Bless, H. (1994). Memory for non-occurrences: Metacognitive and presuppositional strategies. *Journal of Memory and Language, 33,* 203–217.

Strack, F., & Förster, J. (1995). Reporting recollective experiences: Direct access to memory systems? *Psychological Science, 6,* 352–358.

Strack, F., & Förster, J. (1998). Self-reflection and recognition: The role of metacognitive knowledge in the attribution of recollective experience. *Review of Personality and Social Psychology, 2,* 111–123.

Strack, F., & Hannover, B. (1996). Awareness of influence as a precondition for implementing correctional goals. In P. M. Gollwitzer & J. A. Bargh (Eds.), *The psychology of action: Linking cognition and motivation to behavior* (pp. 579–596). New York: Guilford.

Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science, 185,* 1124–1131.