

On the Interplay between Heuristic and Systematic Processes in Persuasion

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Abstract

Dual-process models of persuasion (e.g., Heuristic Systematic Model) contrast the use of heuristics with systematic information processing. However, a great deal of attention is increasingly being devoted to the interplay between the two types of processing. We propose a multistage view that builds on dual-process models of persuasion but emphasizes the interplay between processing modes. According to this multistage view, there are contexts in which receivers first use systematic processes to derive information about expertise from argument quality and, subsequently, make use of the expertise heuristic to arrive at an attitude. We show that results of a classic study (Petty, Cacioppo, & Goldman, 1981) are compatible with this view. Additionally, we report results of a study, in which the effect of argument quality on receivers' attitudes was partially mediated by perceived source expertise (Reimer, 2003). Two follow-up studies revealed that this mediation tended to be stronger among receivers reporting low self-expertise than among receivers reporting high self-expertise.

Introduction

Higher-order cognitive processes are often described by dual-process models that distinguish between systematic (deliberate, top-down, explicit, conscious) and heuristic (automatic, bottom-up, implicit, unconscious) processing. This type of models has become prominent in different areas of cognitive science (for an overview in cognitive psychology, see Rossetti & Rovensuo, 2000; Sloman, 1996; for a reader in social psychology, see Chaiken & Trope, 1999). However, many researchers have criticized this dichotomization of cognition due to its arbitrariness with regard to the distinction of two exclusive processes (see Kruglanski & Thompson, 1999; Gigerenzer & Regier, 1996).

Because we agree there is a need to bring forward models

that look at the relation between the two processing modes, we make a contribution to this effort by focusing on the interplay between heuristic and systematic processes in persuasion (Bohner, Moskowitz, & Chaiken, 1995; Chaiken, 1987) and on the claim that heuristics are typically not used when a message is processed systematically (Petty et al., 1981).

Researchers in the persuasion field have studied under what conditions the expertise heuristic (i.e., "experts are usually correct") is applied by receivers who are faced with a persuasive message (Bohner, Ruder, & Erb, 2002; for other source characteristics, see Petty & Wegener, 1998; Wood & Kallgren, 1988). We show that studies which have assumed that receivers do not use this heuristic when processing information more systematically and deliberately (e.g., Petty et al., 1981) may be reinterpreted by assuming a multistage process in which receivers are assumed to, first, derive information about source expertise from argument quality and, second, make use of the expertise heuristic (Reimer, 2003). We also report follow-up studies which revealed that receivers' perceived self-expertise is a potential moderator that affects whether a direct or an indirect process is taken by receivers.

Heuristic and Systematic Information Processing in Persuasion

The heuristic systematic model (HSM; Chaiken, 1987) distinguishes heuristic and systematic information processing (see Figure 1). According to the HSM, heuristic processing is particularly likely to take place in situations in which people are not motivated or for other reasons are not able to think thoroughly about the contents of a message (e.g., low personal relevance of the topic, time constraints). In contrast,

systematic processing is likely to occur in situations in which participants are highly motivated and able to scrutinize a message (e.g., high topic relevance, no time constraints). Experiments varying argument quality and communicator cues such as source expertise (e.g., Petty et al., 1981) provide support for the claim that motivation and ability determine which process is chosen by the receiver of a message. For example, high time pressure and distractions (e.g., Petty, Wells, & Brock, 1976), low relevance of a topic (Petty & Cacioppo, 1986; Petty et al., 1981), and low need-for-cognition (Cacioppo, Petty, & Morris, 1983) seem to lead to heuristic information processing. In this situation, and given expertise information is provided by an easy-to-process cue (e.g., the communicator is described as a professor vs. student; see Kruglanski & Thompson, 1999), expert statements are typically more convincing than statements given by non-experts (Bohner et al., 2002). In contrast, in situations of high personal involvement attitudes are typically more strongly affected by argument quality, with strong arguments exerting stronger attitude effects than weak arguments. In this situation, the expertise cue usually does not exert strong direct attitude effects (e.g., Bohner et al., 2002; Petty et al., 1981; Petty & Wegener, 1998; for such an effect, see Pantaleo, 1997; Pantaleo & Wicklund, 2000). In sum, in cases of low motivation or ability, the attitude change is mainly a function of the expertise cue, while the opposite conditions foster an effect of argument quality.

HSM does not assume that the two processes are exclusive (Bohner et al., 1995; Chen & Chaiken, 1999). In fact, heuristic and systematic processing are assumed to co-occur under certain conditions (Chaiken, 1987). For example, the expertise cue may affect attitudes by influencing the interpretation of ambiguous arguments (Chaiken & Maheswaran, 1994) or may instigate the formation of expectancies on message quality that serve as a standard to which the subsequent arguments are compared (Bohner et al., 2002). Thus, a communicator cue (e.g., a short description of the communicator's expertise) can directly affect the attitude or may exert indirect attitude effects by affecting the interpretation or the evaluation of the message (see dotted line in Figure 1: expertise→argument quality→attitude path).

This connection raises the possibility of an intricate interplay between heuristic and systematic processes and may imply that there are a number of possible interactions between argument quality, source expertise, and attitudes. Whereas work has been done demonstrating effects of communicator cues on the interpretation and evaluation of arguments (Bohner et al., 2002; Chaiken & Maheswaran, 1994; Petty & Cacioppo, 1986), little is known about the effects of argument quality on the evaluation of communicators and respective influence on attitudes.

In this paper we propose to fill this research gap by showing that the arguments of a message may influence attitudes in two different (although not necessarily exclusive) ways when a message is scrutinized: (1) Arguments may exert a *direct* effect on attitudes, in this case, receivers change their

attitudes due to argument quality; (2) arguments may exert an *indirect* effect by changing perceived source expertise. According to this interpretation, there are contexts in which receivers still apply the expertise heuristic but systematically process information pertaining to communicator expertise.

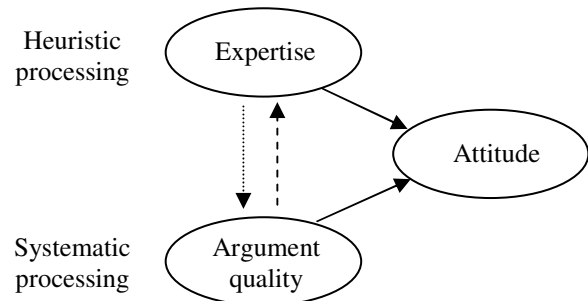


Figure 1: Heuristic and systematic information processing are assumed to exert different attitude effects.

Thus, in contrast to situations in which a direct effect of the expertise cue arises, source expertise is derived from argument quality. Therefore, in this situation, argument quality would have an indirect attitude effect (see dashed line in Figure 1: argument quality→expertise→attitude path).

Direct and Indirect Effects of Argument Quality

Studies that systematically varied both expertise and argument quality dimensions provide some evidence that receivers use argument quality to derive information on source expertise (e.g., Chaiken & Maheswaran, 1994; Petty et al., 1981; Ziegler, Diehl, & Ruther, 2002). For example, in a classic study, Petty et al. (1981) had their students hear a tape advocating that seniors be required to take a comprehensive exam in their major area as a prerequisite to graduation. Participants either learned that the tape was based on a report of a class at a local highschool (low expertise) or on a report prepared by a commission chaired by a professor of education at Princeton University (high expertise). Additionally, argument quality and topic relevance were varied as further experimental factors: The message comprised either strong or weak arguments and the instatement of the exams was either said to take place in one year (high relevance) or in ten years (low relevance). In order to check the success of their manipulations, Petty et al. (1981) measured perceived argument quality and expertise. Because they obviously expected the variation of argument quality would affect perceived source expertise they asked participants to judge expertise independently of the message (Petty et al., 1981, p. 851): „Regardless of how you felt about what the author had to say, how qualified did you think he was to speak on the topic?“ Notably, a strong effect of argument quality was found with this measure of message-independent expertise, and this effect was much stronger than the effect of the description (F s: 39.20 vs. 4.86).

As predicted by Petty et al. (1981), argument quality and expertise interacted with topic relevance. The argument quality manipulation exerted stronger attitude effects when topic relevance was high, whereas the cue on expertise only affected the attitude towards the proposed exams when topic relevance was low. The authors concluded that when a persuasive message concerns an issue of high personal relevance the effectiveness of the appeal is more a function of the cogency of the arguments presented than of the perceived expertise of the source. Conversely, when the message concerns an issue of relatively low personal relevance, effectiveness is more a function of source expertise.

However, because of the dependency of the experimental factors, the results do not rule out that the receivers in the high relevance condition still used the expertise heuristic. According to our alternative explanation, the difference between the conditions of low and high relevance consists of how participants arrived at their source expertise judgments. Receivers in the low relevance condition may have used the information provided by the description (direct effect of the expertise cue), whereas receivers in the high relevance condition could have derived expertise from the quality of the message (indirect effect of argument quality). Thus, some participants may have applied the expertise heuristic even in the high relevance condition, that is, in the systematic processing condition.

In the next section, we outline a study (see Reimer, 2003, for details) in which we sought to: (a) replicate the effect of argument quality on perceived expertise; (b) test if the judges are able to evaluate expertise independently of argument quality; and (c) test if the effect of argument quality on the attitude is mediated by perceived source expertise (indirect effect). Given our hypotheses concerning systematic processing of message content we chose a topic that could be assumed to be relevant to all participants in our study: the new set-up of the credit point system in their major.

As in the classic study by Petty et al. (1981), we experimentally varied argument quality and source expertise. In order to have a baseline for possible effects of argument quality that are independent from the description of the communicator, an additional control condition was included in which participants did not receive any communicator cue.

Method

Participants were provided with a fictitious magazine article on the new set-up of the credit-point system in psychology at the University of Basel. Thereby, the description of the author (high expertise, low expertise, or no information) and argument quality (high vs. low) were varied between participants.

Participants

The sample consisted of one hundred undergraduate students in psychology with a mean age of 23.1 years.

Material

The Department of Psychology at the University of Basel started a new curriculum some years ago, which established a credit point system within the B.Sc. studies in psychology. According to the new regulations, undergraduates need 12 credit points for the module „Biological psychology and neuropsychology.” Participants received a fictitious article from a university magazine (*Uni Nova*) in which the author proposed to reduce the number of obligatory credit points in this module to 6 points and increase instead the number of credit points for optional subjects that can be freely chosen by students from 30 to 36 points. In the condition of *high [low] expertise*, the author was introduced as a 25 [22] year old psychology [chemistry] student from the University of Hamburg currently finishing his M.Sc. [intermediate exam].

After a short introduction to the topic, the author explicitly stated that, from his point of view, the proposed renewal of the credit point system had only advantages. Overall, arguments on six different topics were provided in each of the two conditions of strong and weak argument quality. Each topic was presented as a separate short paragraph.

The arguments were selected from a list of potential arguments produced by five students who were interested in the topic and had participated in the discussion of the renewal of the credit point system. Their task consisted of listing potential arguments in favor of the renewal. After discussing each item, we selected twelve arguments on which there was agreement as to whether they were weak or strong. For example, in the condition of *strong arguments*, the author cited a fictitious study showing that students who attended courses in subjects outside psychology found a job faster and had higher incomes. Moreover, the opportunity to choose subjects was said to enhance the students' motivation and performance. In the condition of *weak arguments*, the renewal was said to enable students to meet more students from other sciences and to choose courses that fit better individual time schedules and save time by requiring shorter distances between classes.

Measures and Procedure

Argument quality All items were measured on a nine-point Likert scale (-4, totally disagree to +4, totally agree). Perceived argument quality was measured by asking whether or not arguments were: a) persuasive and b) good (Cronbach's $\alpha = .96$).

Source expertise Perceived source expertise was measured by the following items (Cronbach's $\alpha = .96$): a) „The author is competent;” b) „The author knows the regulations in psychology quite well;” and c) „The author has a high expertise with regard to the regulations.” Except for the control condition, participants were additionally asked to evaluate the expertise independently from the arguments used („I would judge the author as qualified, regardless of what the author had to say”).

Attitude The following three items were administered to measure the attitude towards the proposed renewal: a) „The proposed change between the modules ‘Biological psychology and neuropsychology’ in favor of ‘optional subjects’ is useful;” b) „The proposed change should be introduced in October 2002;” and c) „I would prefer to study under the curriculum of the 26th of June 2001.” After converting the third item, the three items were aggregated to form an overall attitude measure (Cronbach’s $\alpha = .87$).

The items concerning participants’ attitudes, perceived source expertise, and perceived argument quality were administered in a random order along with various additional measures (e.g., on the perceived relevance of the topic and on participants’ need for cognition; see Reimer, 2003).

Results

Argument quality The means of the attitude towards the proposal as well as of perceived argument quality and perceived expertise are shown in Table 1. As expected, the strong arguments ($M = 1.92$; $SD = 1.35$) were judged to be better than the weak arguments ($M = -2.74$; $SD = 1.64$; $F(1,94) = 236.56$; $p < .01$). The expertise manipulation did not affect perceived argument quality (main effect of *expertise*: $F(2,94) = 0.87$; $p = .42$; interaction: $F(2,94) = 0.30$; $p = .74$).

Source expertise In contrast, perceived source expertise was affected by both factors, the description of the author ($F(2,94) = 4.16$; $p < .05$) as well as argument quality ($F(1,94) = 40.57$; $p < .01$; interaction: $F(2,94) = 0.48$; $p = .62$). Obviously, when judging the author’s expertise, both information sources were taken into consideration. Moreover, as in the Petty et al. (1981) study, perceived source expertise was affected by message quality if participants were explicitly asked to judge the author’s expertise independently from the quality of his message (see Reimer, 2003).

Table 1: Means of attitudes, perceived argument quality, and perceived source expertise.

	Source expertise		
	High	Low	Control
Argument quality			
Strong arguments	1.83	1.87	2.06
Weak arguments	-2.79	-3.14	-2.36
Source expertise			
Strong arguments	1.46	0.16	1.50
Weak arguments	-0.91	-1.45	-0.63
Attitude			
Strong arguments	2.28	2.16	2.77
Weak arguments	-0.11	1.02	0.07

Attitude The attitude towards the proposed renewal was exclusively affected by argument quality ($F(1,94) = 38.36$; $p < .01$), but was independent from the description of the author ($F(2,94) = 0.8$; $p = .45$; interaction: $F(2,94) = 1.91$; $p = .15$).

Mediation analysis: Direct and indirect effects of argument quality The manipulation of source expertise did not exert a significant direct or indirect effect on participants’ attitudes or perceived argument quality. Thus, there was no evidence for the expertise→argument quality→attitude path (see dotted line in Figure 1). Because participants were provided with a topic they judged to be personally relevant (Reimer, 2003), such an effect was also not expected. The main purpose of our study was to test for an indirect effect of argument quality (see dashed line in Figure 1). Thus, the crucial question was: Is the effect of the argument quality manipulation on participants’ attitudes mediated by perceived source expertise?

As shown before, the manipulation of argument quality had a direct effect on the perceived expertise of the author as well as on the attitude towards the proposal (see Figure 2). Additionally, these two variables correlated significantly ($r = .50$; $p < .01$). In order to test if the attitude effect of argument quality is mediated by perceived source expertise, two regression analyses were run (cf. Baron & Kenny, 1986; p. 1177). A significant mediation requires that the effect of argument quality on the attitude is substantially reduced when perceived expertise is included as a further predictor. In line with this criterion, the inclusion of perceived source expertise reduced the β -coefficient of argument quality from $.54$ ($p < .01$) to $.38$ ($p < .01$). The indirect effect was significant ($z = 4.19$; $p < .01$; see Baron & Kenny, 1986, p. 1177).

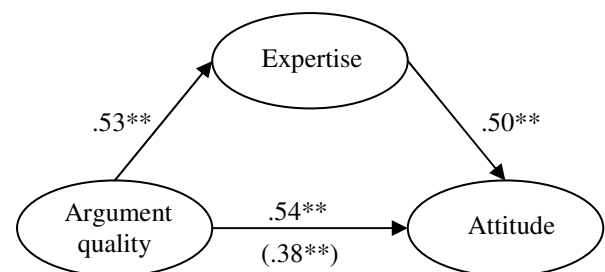


Figure 2: Direct and indirect attitude effects of argument quality.

Thus, the effect of argument quality on receivers’ attitudes was partially mediated by perceived source expertise. The main results remained stable when the control condition, in which participants did not receive any information on the communicator, was excluded from the analyses. Then, the effect of argument quality on attitudes was somewhat smaller (the respective β -coefficients were $.48$ and $.31$) whereas the other two β -coefficients were almost identical.

Follow-Up Studies: The Role of Perceived Self-Expertise

One issue that arises from the multistage perspective is the identification of variables that determine whether and to what extent a direct or indirect path is taken. In other words, when do receivers use the expertise heuristic? We addressed this issue in two follow-up studies, which considered one potential moderator: perceived self-expertise. In the risk communication literature there is evidence that perceived source characteristics, such as trustworthiness and expertise, determine judges' risk perceptions in domains in which judges do not have much knowledge—judges seem to apply the expertise heuristic if they are not themselves experts (e.g., Siegrist & Cvetkovich, 2000). In the follow-up studies, we included these insights from the risk-communication literature by testing if judges' perceived self-expertise moderates the indirect attitude effect of argument quality (moderated mediation).

In the first follow-up study (see Reimer, Mata, & Stoecklin, 2004, for details), we used the same materials concerning the renewal of the credit point system but additionally considered receivers' perceived self-expertise. As in the study described above, the effect of argument quality on receivers' attitudes was partially mediated by perceived source expertise. This indirect effect tended, as expected, to be more pronounced among judges who reported low self-expertise—all judges used argument quality to evaluate source expertise, but those who judged themselves as non-experts tended to base their attitude more strongly on perceived source expertise.

The second follow-up study replicated the effect of perceived self-expertise in the domain of risk communication (Reimer, Mata, & Kuendig, 2004). Participants were provided with a website that suggested a certain vaccination when traveling to India. As before, argument quality affected perceived source expertise as well as the attitude towards the vaccination. In line with the expected moderated mediation, the attitude effect was mediated by perceived expertise for low-expertise but not high-expertise participants. This pattern of results was stable over a four-week time period. Taken together, the follow-up studies suggest that indirect effects of argument quality seem to be particularly likely if the issue at hand is relevant and if receivers do not judge themselves to be experts.

Discussion

In general, only those features of a message that are sufficiently processed and discriminated can have an impact on a receiver's attitudes. Usually, in studies on persuasion, communicator cues are easier to discriminate than argument quality (Erb, Kruglanski, Chun, Pierro, Mannetti, & Spiegel, 2003; Kruglanski & Thompson, 1999). Thus, if a receiver does not process a message systematically, these easy-to-process cues (Bohner & Siebler, 1999) are more likely to exert an effect than argument quality. However, one should

be careful in concluding that the perception of source expertise does not matter during systematic information processing. There is ample empirical evidence showing that communicator cues can (a) influence how systematically messages are processed (cf. Petty & Cacioppo, 1986; Ziegler et al., 2002); (b) determine the interpretation of ambiguous arguments (cf. Chaiken & Maheswaran, 1994); and (c) instigate expectancies to which arguments are then contrasted (cf. Bohner et al., 2002). These various effects are examples of *indirect effects* of communicator cues: the cues affect attitudes by directing processing goals and the interpretation of the arguments (see dotted line in Figure 1: expertise→argument quality→attitude path).

We showed that the findings of the Petty et al. (1981) study can be alternatively explained by a multistage process in which people first derive source expertise from argument quality and then apply the expertise heuristic (see dashed line in Figure 1: argument quality→expertise→attitude path). Thus, systematic processing of information does not rule out the use of heuristics. Our main goal was to provide an alternative to a strict dichotomization of higher cognitive processing by proposing the idea of multistage processing. This general view is compatible with contemporary approaches to higher-order cognition in cognitive science (Gigerenzer, Todd, & The ABC Research Group, 1999). Even though our work points to an alternative to standard dual-process models it is worth noticing that the observed mediation is based on correlational data and thus does not allow determining the causal relationship between the main variables. Rather, there are several possible causal relationships between these variables and other models could potentially account for our findings. This sort of problem is pervasive in persuasion research; the most prominent models such as the heuristic systematic processing model (Chaiken, 1987), the elaboration likelihood model (Petty & Cacioppo, 1986), and the unimodel (Kruglanski & Thompson, 1999) greatly overlap in explanatory power. One direction that might further our understanding of the processes involved in persuasion and their interrelations is to specify the underlying mechanisms in more detail so that we can study these directly (Gigerenzer & Regier, 1996; O'Keefe, 2003).

Concerning future directions, it would be fruitful to link research on persuasion with that on impression formation, which has traditionally focused on impressions based on agents' behaviors (Srull & Wyer, 1989). Issues of theoretical and applied interest are, for instance, the differential stability over time and resistance to counterfactual evidence of impressions derived on systematic processing (e.g., through argument evaluation) vs. heuristic processing.

Acknowledgment

We thank Nathalie Erpelding, Maureen Groeben, Sascha Kuendig, Mattias Leimgruber, and Daniel Meier for their help in producing materials and data collection.

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