

The Path or the Goal? Decision vs. Information Focus in Biased Information Seeking after Preliminary Decisions

Jonas, Eva; Traut-Mattausch, Eva; Frey, Dieter; Greenberg, Jeff

Postprint / Postprint

Zeitschriftenartikel / journal article

Zur Verfügung gestellt in Kooperation mit / provided in cooperation with:

www.peerproject.eu

Empfohlene Zitierung / Suggested Citation:

Jonas, E., Traut-Mattausch, E., Frey, D., & Greenberg, J. (2008). The Path or the Goal? Decision vs. Information Focus in Biased Information Seeking after Preliminary Decisions. *Journal of Experimental Social Psychology*, 44(4), 1180-1186. <https://doi.org/10.1016/j.jesp.2008.02.009>

Nutzungsbedingungen:

Dieser Text wird unter dem "PEER Licence Agreement zur Verfügung" gestellt. Nähere Auskünfte zum PEER-Projekt finden Sie hier: <http://www.peerproject.eu> Gewährt wird ein nicht exklusives, nicht übertragbares, persönliches und beschränktes Recht auf Nutzung dieses Dokuments. Dieses Dokument ist ausschließlich für den persönlichen, nicht-kommerziellen Gebrauch bestimmt. Auf sämtlichen Kopien dieses Dokuments müssen alle Urheberrechtshinweise und sonstigen Hinweise auf gesetzlichen Schutz beibehalten werden. Sie dürfen dieses Dokument nicht in irgendeiner Weise abändern, noch dürfen Sie dieses Dokument für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, aufführen, vertreiben oder anderweitig nutzen.

Mit der Verwendung dieses Dokuments erkennen Sie die Nutzungsbedingungen an.

gesis
Leibniz-Institut
für Sozialwissenschaften

Terms of use:

This document is made available under the "PEER Licence Agreement". For more information regarding the PEER-project see: <http://www.peerproject.eu> This document is solely intended for your personal, non-commercial use. All of the copies of this documents must retain all copyright information and other information regarding legal protection. You are not allowed to alter this document in any way, to copy it for public or commercial purposes, to exhibit the document in public, to perform, distribute or otherwise use the document in public.

By using this particular document, you accept the above-stated conditions of use.

Mitglied der

Leibniz-Gemeinschaft

Accepted Manuscript

The Path or the Goal? - Decision vs. Information Focus in Biased Information Seeking after Preliminary Decisions

Eva Jonas, Eva Traut-Mattausch, Dieter Frey, Jeff Greenberg

PII: S0022-1031(08)00031-0
DOI: [10.1016/j.jesp.2008.02.009](https://doi.org/10.1016/j.jesp.2008.02.009)
Reference: YJESP 2061

To appear in: *Journal of Experimental Social Psychology*

Received Date: 22 October 2006
Revised Date: 30 October 2007
Accepted Date: 27 February 2008

Please cite this article as: Jonas, E., Traut-Mattausch, E., Frey, D., Greenberg, J., The Path or the Goal? - Decision vs. Information Focus in Biased Information Seeking after Preliminary Decisions, *Journal of Experimental Social Psychology* (2008), doi: [10.1016/j.jesp.2008.02.009](https://doi.org/10.1016/j.jesp.2008.02.009)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



Running Head: DECISION VS. INFORMATION FOCUS IN INFORMATION SEEKING

The Path or the Goal? - Decision vs. Information Focus in Biased Information Seeking after

Preliminary Decisions

Eva Jonas

University of Salzburg

Eva Traut-Mattausch

Ludwig-Maximilians-University Munich

Dieter Frey

Ludwig-Maximilians-University Munich

Jeff Greenberg

University of Arizona

Word count (including text and footnotes) 4984

06.03.2008

Abstract

Research on the phenomenon of selective exposure to information demonstrates that after preliminary or final decisions, people show a preference for supporting rather than conflicting information (confirmation bias). In this article, we examine conditions that increase or decrease distortions in the search for information. We report on four experiments indicating that the confirmation bias is influenced by whether people focus on their decision or on the presented pieces of information during the information search. Focusing on the decision, for example, because a reward for a correct decision is promised or simply because participants repeatedly think of it, increases the confirmation bias. On the other hand, if participants focus on the available pieces of information because they have to invest money in order to search for information or because they have to evaluate the individual pieces of information, the confirmation bias decreases. Implications for theoretical understanding and interventions for decision-making situations are discussed.

Key words: selective exposure to information after decisions – dissonance theory – salience – decision vs. information focus – incentives – costs – commitment

The Path or the Goal? - Decision vs. Information Focus in Information Seeking Bias after Decisions

Studies investigating information seeking behavior after decisions have shown that once committed to an option, people prefer supportive as opposed to conflicting information (for overviews see Frey, 1986; Frey, Schulz-Hardt, & Stahlberg, 1996). One theory that can explain this phenomenon is dissonance theory (Festinger, 1957, 1964): After having made a decision, cognitive dissonance arises from the knowledge about the disadvantages of the chosen and the advantages of the non-chosen alternative. Dissonance can be reduced by searching for information supporting the decision (consonant information) and avoiding such information conflicting with it (dissonant information). This tendency has been shown not only to occur after final but also after preliminary still reversible decisions (Jonas, Schulz-Hardt, Frey, & Thelen, 2001). It also arises if the experimental situation is adapted more closely to reality (Jonas et al., 2001; Fischer, Jonas, Frey, & Schulz-Hardt, 2005), if people are deciding in groups (Schulz-Hardt, Frey, Lüthgens, & Moscovici, 2000) or if real decision-makers, such as managers, are observed in experiments (Schulz-Hardt et al., 2000, see also the related research by Carlson & Russo, 2001, for pre-decisional distortions in the context of legal trials). All in all, the results suggest that biased searching for supportive information is a widespread phenomenon.

The quality and success of decisions depend on the amount and kind of information that is considered during the decision process (cf. e.g., Eisenhardt, 1989; Kirschenbaum, 1992; Darley, Fleming, Hilton, & Swann, 1988; Koriat, Lichtenstein, & Fischhoff, 1980; Kray & Galinsky, 2003). Yet, if the search for and processing of information is clearly biased in favor of a decision-maker's initial preferences, potential risks may be overlooked (cf. e.g., Darley et al., 1988; Kray & Galinsky, 2003). When new information becomes available after an initial decision, open-mindedness in dealing with new information is important to rectify a wrong decision as early as possible.

One factor influencing the tendency to selective exposure to information is the focus participants have during the information search (Jonas et al., 2001). Whereas focusing on the

decision increases the preference for supporting information, focusing on the available pieces of information reduces it. Jonas et al. (2001) suggested that in sequential information search people *focus on the decision* because having only one piece of information at a time makes it necessary to relate it to the decision preference. In simultaneous information search, however, people have access to all available pieces of information at once, allowing them to compare, evaluate and integrate the different pieces, thereby inducing an *information focus*. Moreover, Jonas et al. provided evidence that focusing on the decision increased participants' commitment, which partially mediated the effects. Studies by Pomerantz, Chaiken, and Tordesillas (1995) suggest that a participant's commitment to a decision is reflective of the decision's salience in the mind of that person.

In the present research we want to further investigate the focus-hypothesis and provide converging evidence regarding the role of focus in showing that there is a wide range of different situational factors, like incentives, costs, and attention, that shift focus towards either the decision or the information and thereby affect the information search.

The current research

We report four experiments testing these predictions. All followed a similar procedure: Students worked on a decision-making case, first made a preliminary decision and were then offered additional pieces of information by receiving a list of statements each summarizing the topic of one available article. Half of the additional information was clearly consonant, and half dissonant with the previous decision.¹ After participants had selected those articles they would like to read they indicated their final decision. In all experiments the central dependent variable was the difference between the number of chosen supporting and conflicting pieces of information, which we call the confirmation bias. Our hypothesis for all experiments is that circumstances encouraging

¹ Consonant pieces of information were those supporting the previous decision (information in favor of the chosen or against the rejected alternative) and dissonant pieces those conflicting with it (information against the chosen or in favor of the rejected alternative). All pieces of information were either based on former research or pre-tested to ensure that participants understood the direction of information (supporting vs. conflicting) and that all information was of comparable strength.

participants to focus on their decision will increase confirmation bias, whereas circumstances leading participants to focus on the information search will decrease it.

EXPERIMENT 1

In the first experiment, we hypothesized that introducing a monetary incentive to make a correct decision increases confirmation bias because the incentive leads people to repeatedly think of their decision preference and thus increases decision salience.

According to a cost-benefit perspective of decision-making (e.g., Payne, Bettman, & Johnson, 1993) the selection of decision strategies is the result of a trade-off between a desire to make a correct decision and a desire to minimize effort. In situations in which incentives are involved, people want to make a decision with the best possible outcome. Indeed, research shows that incentives increase the amount of attention given to a task (Stone & Ziebart, 1995), lead people to invest more time and think in more complex terms (e.g., Ford & Weldon, 1981; McAllister, Mitchell, & Beach, 1979, Exp. 3). In addition, accuracy motivation has been found to balance the information search (Lundgren & Prislin, 1998; Johnston, 1996). However, if incentives for a correct decision cause people to increase the attention given to a task (Stone & Ziebart, 1995), it might also induce people to focus more on their decision, to increase their desire to make a correct decision and thus increase the decision's salience. Increased selective exposure might be the consequence.

Method

Participants and design. Twenty seven students (18 female) from the University of Munich participated in this experiment based on a 2 x 2 (reward for correct decision: given vs. not given, type of information: supporting vs. conflicting) factorial design with repeated measures on the second factor.

Procedure. The decision-making case in this study was about a company's investment problem and the participants were asked imagine themselves in the role of a manager (see e.g., Frey, 1981, Exp. 1). The company wanted to transfer parts of its production capacities to either country A or to country B, which were both described in terms of 16 business traits, like tax levels

etc.. In the information search 10 statements by economic experts were presented. These had allegedly been asked to give a recommendation on which of the two countries seemed to be better suited for investment (e.g., “The labor market in country B offers qualified managerial staff as well as qualified skilled workers. Therefore, an investment in country B is recommended.”). In the reward condition, it was emphasized that the additional information could help them find out what the correct decision alternative was and that they would receive a reward of DM 5 (about US \$ 2.50) if they chose the correct option. In the no-reward condition there was no such information. When the experiment was over, participants were debriefed, thanked, and received DM 5.

Results and Discussion

The 2 x 2 ANOVA of the experimental design revealed a marginal main effect for type of information, $F(1, 25) = 3.51, p < .08$ (overall, participants selected more supporting, $M = 1.59, SD = 1.31$, than conflicting statements, $M = 1.11, SD = 1.09$), and the predicted interaction between “type” and “reward”, $F(1, 25) = 4.78, p < .04$ (see Table 1)², indicating that promising a reward for the correct decision increased the preference for supporting compared to conflicting information. This effect, first shown in the selective exposure paradigm, at first glance seems counter-intuitive considering the cost-benefit approach. Yet, it is in accordance with the above outlined focus-hypothesis, which proposes that incentives leading participants to pay more attention to their decision preference and that consequently making the decision problem more salient will increase the confirmation bias.

Experiment 2

However, incentives might also make participants focus more on additional information to search for: Participants who have to pay money for the information search may think more carefully about what information to choose. We suggest that this induces an information focus leading to a decrease in confirmation bias. We tested this prediction in Experiment 2.

² In all studies a few participants revised the preliminary decision at the end. If they were excluded from the analyses the effects remained basically the same. We also checked whether the kind of decision (alternative A or B) interacted

Method

Participants and design. There were thirty-one participants (19 female) from the University of Munich who were told that they could win a ticket for a cinema visit in this experiment based on a 2 x 2 (cost for information search: yes vs. no, type of information: supporting vs. conflicting) factorial design with repeated measures on the second factor.

Procedure. Participants had to make a decision whether they wanted to receive a free ticket for the movie “Mathilda” or “Michael”, which were both scheduled to open at cinema theatres in town in the coming weeks. For the information search we had summarized articles from movie reviews and presented a list of 12 statements (e.g., “movie Michael – excellent entertainment”) from which participants could make their selection of articles they wanted to read. The information search was either free or cost 0.50 DM (about 25 cents) per piece of information. In the end, participants were debriefed and got a cinema voucher.

Results and Discussion

The 2 x 2 ANOVA revealed a main effect for costs, $F(1, 29) = 7.90, p < .01$: Imposing monetary costs on the information search reduced participants’ willingness to search for additional information overall (costs: $M = 2.19, SD = 1.28$ vs. no costs $M = 3.87, SD = 2.00$) – this finding is in accordance with the cost-benefit approach to decision-making (Gilliland, Schmitt, & Wood, 1993; Payne et al., 1993). However, the predicted interaction between “type of information” and “costs”, $F(1, 29) = 4.14, p = .05$ (see Table 2), showed that interestingly the reduction of the search for supporting information was greater than the reduction of the search for conflicting information. Thus the introduction of information search costs reduced the confirmation bias.³

Taken together the results from Studies 1 and 2 illustrate that monetary incentives can have

with the experimental manipulations but found no reliable interactions. Gender was in no study associated with the information search.

³ Even though in this experiment participants literally paid a fee to consider information, we suggest the key point is not the cost but rather the more careful consideration of information that the manipulation apparently induced. In accordance with this notion are the finding of an additional experiment ($n = 75$) showing that participants who were asked to write down reasons why they selected a specific piece information also revealed a decreased confirmation bias ($M = -0.62, SD = 1.51$, i.e. these participants even showed a preference for conflicting information, vs. $M = 0.08, SD =$

very different effects on the information search depending on whether they apply to the decision or to the information search. This pattern is supported by an additional experiment ($n = 81$), which we only want to report very briefly. Here we manipulated both benefits of a correct decision (promising participants a monetary reward if they made the correct decision) and costs for the information search (in form of cognitive effort by telling participants to memorize those information titles they wanted to read in more detail and later write them down on an information request sheet) using the same decision case as in Study 1: Both effects found in the previous experiments were replicated. An incentive for the correct decision increased bias in information search ($\underline{M} = +0.21$, $\underline{SD} = 1.12$ without vs. $\underline{M} = +0.74$, $\underline{SD} = 1.36$ with reward)⁴, whereas increasing the cost of information search reduced the bias ($\underline{M} = +0.76$, $\underline{SD} = 1.59$ without vs. $\underline{M} = +0.23$, $\underline{SD} = 0.77$ with costs).

EXPERIMENT 3

In this experiment we used more direct focus manipulations: For decision focus we asked participants to think of their decision preference while searching for information. For information focus we instructed participants to concentrate on *all* available pieces of information by comparing and evaluating them. In addition, we used commitment as an indirect measure to assess the decision's salience in the different experimental conditions (see Pomerantz et al., 1995). We expected that repeatedly thinking about the prior decision would increase the commitment to the decision. On the other hand, concentrating on the available pieces of information should decrease the decision's salience and thus reduce commitment.

Method

Participants and design. Seventy-seven students (48 female) from the University of Munich participated in this experiment based on a 3 x 2 (focus: no focus, decision focus, information focus, type of information: supporting vs. conflicting) factorial design with repeated measures on the second factor.

1.42 for the group who did not have to give reasons), $F(1, 73) = 4.22$, $p < .05$.

⁴ In the reward condition participants also searched for more information altogether ($\underline{M} = 3.40$, $\underline{SD} = 1.56$) than without

Procedure. The decision problem in this study was whether or not alternative healing methods should be covered by health insurance (see Jonas et al., 2001). Participants were informed that currently a preliminary law passed by the German parliament settled this question but that a definite decision was still pending. After the preliminary decision participants were asked to write down some reasons for it. The information search consisted of 12 statements (e.g., “The success of alternative healing methods cannot be ignored. Therefore, alternative treatments should also be paid by health insurance.”).

In the “decision focus” condition, following every two pieces of information participants were asked to think again of their prior decision by instructions like please recall or please think of your decision. In the “information focus” condition, while deciding whether or not they wanted to read each piece of information in more detail, participants were requested to evaluate each thesis with regard to three aspects: credibility of the article, competence of the author, persuasiveness of the article. To ensure that participants actually performed this evaluation, they were given a rating scale ranging from 1 to 10 for evaluating each aspect. In the control condition, participants just selected the pieces of information they wanted to read without any focus manipulation.

After the preliminary and final decision we measured participants’ commitment by asking them to indicate how binding they felt their decision was (scale from 1 = not at all to 10 = very much). Afterwards, the participants were debriefed and thanked.

Results and Discussion

The 3 x 2 ANOVA revealed a significant main effect for “type of information”, $F(1, 74) = 65.12$, $p < .001$ (participants preferred supporting, $M = 2.95$, $SD = 1.69$, to conflicting information, $M = 1.40$, $SD = 1.44$). In addition, there was the predicted interaction with “focus”, $F(2, 74) = 9.81$, $p < .001$ (see Table 3), indicating that repeated thinking of the preliminary decision when searching for information increased the preference for supporting information compared to the control group whereas focus on the information search decreased this preference.

reward ($M = 1.95$, $SD = 1.89$).

The 3 (focus: decision vs. information vs. no focus) x 2 (commitment: after preliminary vs. after final condition) ANOVA with repeated measures on the second factor found a main effect for commitment, $F(1, 74) = 22.32, p < .001$ (commitment had increased from the preliminary, $M = 6.03, SD = 2.69$, to the final decision, $M = 7.03, SD = 2.51$) and the predicted interaction, $F(2, 74) = 7.24, p < .002$ (see Table 3) suggesting that the decision focus increased the decisions' salience (as measured by commitment, see Pomerantz et al., 1995), whereas the information focus reduced it. Furthermore, an increase in participants' commitment towards their decision correlated significantly with the confirmation bias ($r = .29, p < .02$)⁵ (see also Jonas et al., 2001; Schulz-Hardt et al., 2000).

EXPERIMENT 4

In a final step we wanted to show that commitment, an indicator of decision salience, as well as confirmation bias would be increased when promising a monetary reward for the correct decision. As greater commitment leads people to defend their beliefs (e.g., Pomerantz et al., 1995) we assumed that it would increase participants' motivation to find more decision-supporting information but also increase their motivation to avoid decision-conflicting information. To analyze participants' information treatment – in addition to information search – we included a memory measure and predicted that promising a reward would also bias participants' memory for the information presented during the information search. Furthermore, we predicted that commitment would mediate the effect of promising a reward on biased information seeking and memory.

Method

Participants and design. Forty-two students (18 female) from the University Duisburg-Essen participated in this experiment, which was based on a 2 x 2 (reward for correct decision: yes vs. no, type of information: supporting vs. conflicting) factorial design with repeated measures on the second factor.

Procedure. The decision case and experimental procedure was the same as in Study 1 with the following three exceptions: (1) In the reward condition, participants were promised Euro 3

(about US \$3.80) instead of DM 5 if their final decision was correct. During the information search they were twice reminded that the information could help them find the correct decision alternative, and that making the correct final decision would be rewarded by Euro 3. (2)

Commitment was measured with four items: We measured how binding participants felt their decision was and how much they had identified with the company (scale from 1 = not at all to 10 = very much). In addition we asked how attractive participants found country A and country B (following Pomerantz et al., 1995, who found that attitude extremity loaded strongly on the commitment factor). From these two items we calculated an attractiveness difference (attractiveness of chosen minus non-chosen alternative) to get an estimate of attitude extremity.⁶ We first z-transformed the items measuring participants' commitment and then created a scale ($\alpha = .70$). (3)

Finally, we measured participants' memory performance by presenting a list of thirty-four statements (e.g., "This country offers qualified managerial staff as well as qualified skilled workers") including fifteen statements from the description of the two countries in the decision case and nineteen statements from the information search. The participants were asked whether or not each statement was correct "only for country A", "only for country B", "for both countries A and B" or "for none of the two countries".

Results⁷

Information search. The 2 x 2 ANOVA of the experimental design revealed a marginal main effect for type of information, $F(1, 28) = 3.67, p < .07$ (supporting statements, $M = 3.10, SD = 1.58$, were preferred to conflicting, $M = 2.30, SD = 1.56$) and an interaction with "reward", which replicated the results of Experiment 1, $F(1, 28) = 4.53, p < .05$ (see Table 4).

Commitment. In the reward condition participants showed significantly greater commitment

⁵ We also conducted a mediation analysis but found no reliable effect.

⁶ In addition, we asked some further questions not relevant for the aim of this study.

⁷ Three participants who did not follow the instructions, two with missing values on the primary dependent variable and one outlier of more than 2.5 standard deviations on the mean (Kirk, 1995) were excluded from the analysis. In addition, to have an accurate measure of participants' commitment to their final decision and for memory of the consonant and dissonant information, we excluded another six participants who revised their decision. However, if they were left in the analysis the central interaction between type of information and reward for correct decision still approached

($\underline{M} = 0.43$, $\underline{SD} = 0.71$) than with no reward ($\underline{M} = -0.18$, $\underline{SD} = 0.68$), $t(28) = 2.36$, $p < .03$.

Furthermore as in the previous experiment commitment correlated positively with the confirmation bias ($r = .44$, $p < .02$).

Memory performance. To analyze the results of the memory test we calculated means for the correct answers regarding the consonant and dissonant pieces of information. The 2 (reward: yes vs. no) x 2 (memory test: consonant vs. dissonant information) ANOVA revealed a main effect for memory, $F(1, 27) = 7.65$, $p = .02$ (on average participants were better at remembering dissonant, $\underline{M} = 0.59$, $\underline{SD} = 0.21$, than consonant information, $\underline{M} = 0.47$, $\underline{SD} = 0.16$). This is consistent with prior research demonstrating better recall of schema-inconsistent information (e.g., Pyszczynski, LaPrelle, & Greenberg, 1988). However, an interaction with “reward”, $F(1, 27) = 4.07$, $p = .05$, indicated that in the reward condition the relative better memory for the dissonant pieces of information disappeared (reward: $\underline{M} = 0.52$, $\underline{SD} = 0.19$; no reward: $\underline{M} = 0.68$, $\underline{SD} = 0.21$), whereas for the consonant information there was hardly any difference between the two conditions (reward: $\underline{M} = 0.49$, $\underline{SD} = 0.16$; no reward: $\underline{M} = 0.46$, $\underline{SD} = 0.17$). Furthermore, the higher participants’ commitment the worse their memory for the dissonant pieces of information, $r = -.53$, $p = .003$ (there was no correlation regarding consonant information, $r = -.04$, $p > .84$).

Mediation analyses. Following Shrout and Bolger (2002) for small samples (between 20 and 80 participants) the bootstrap method is more appropriate to test mediation than the Sobel test (Sobel, 1982). The results of the bootstrap method (1000 bootstrap samples, using AMOS 6.0, Arbuckle, 2005) indicated that the indirect effect of reward on confirmation bias due to mediation was statistically significant ($p = .04$). Also the indirect effect of reward on memory for dissonant pieces of information, due to mediation, was statistically significant ($p = .03$).

Discussion

Promising a reward for the correct decision not only increased the confirmation bias in information seeking, it also increased participants’ commitment and the increased commitment

significance, $F(1, 34) = 3.93$, $p = .056$.

mediated the effect of reward on the confirmation bias. Moreover, participants' in the reward condition revealed a relatively worse memory performance for the dissonant pieces of information they read during the information search and this measure again correlated with commitment. As the dissonant pieces of information threaten participants' preliminary decision it is not surprising that the more committed participants' felt to their decision the less integrated the dissonant information was in their cognitive structure. This corresponds with Pomerantz et al.'s (1995) finding of the positive association between commitment and selective judgment and elaboration being both mainly caused by the tendency of strongly committed participants to react more critically to attitude-incongruent material.

GENERAL DISCUSSION

Taken together the present research provides converging support for the idea that focus on a decision increases confirmation bias and focus on the information search reduces it. The first studies altered the extent of focus on the decision or the information indirectly by promising participants a reward for the correct decision (decision focus) or asking them to invest different types of costs in the information search (information focus). In Study 3 we then manipulated focus on decision vs. on information directly and additionally showed that the repeated thinking about the decision, increased participants' commitment towards their decision, whereas leading participants to focus on the available pieces of information decreased commitment. Finally, Study 4 illustrated that an indirect induction of decision focus (reward for the correct decision) also increased participants' commitment and that this mediated the effect of reward on both confirmation bias and memory bias. Thus, using a variety of operationalizations the findings converge squarely on focus as a key variable in understanding biased information seeking. The effects of incentives completely depended on whether incentives were given with regard to the decision or the available information. The same was true regarding repeated thinking of the decision vs. the available information.

We propose that our findings can be explained within the framework of dissonance theory: Focusing on, and commitment to, the decision should increase the experience of cognitive

dissonance, whereas focusing on the information should reduce the experience of dissonance.

Indeed our findings are in line with other dissonance theoretical research: Using the “forbidden toy paradigm”, Zanna, Lepper, and Abelson (1973) found that children in the low punishment condition who were reminded of not playing with their favorite toy derogated the toy more than children not reminded of their dissonance. Similar effects were observed using a hypocrisy manipulation (Stone, Aronson, Crain, Winslow, & Fried, 1994). On the other hand, distracting participants from the experience of dissonance (by shifting their attention away from the content of a counter-attitudinal essay toward its grammar), led to lower dissonance reduction effects (Brock, 1962).

A possible alternative process that could have led to our findings is suggested by research showing that repeated thinking about an attitude can lead attitudes to become more extreme (Tesser, Martin, & Mendolia, 1995). Focus on thinking about the decision may have increased belief in it and commitment to it, thereby increasing biased information search. In contrast, increasing thought about the information may have reduced thought about the decision and thereby reduced belief in the decision. Further research will be needed to closely examine the role of specific affective and cognitive processes in these effects.

The focus approach and accuracy motivation

With proposing the focus approach to understanding biased information search we do not want to rule out that offering an incentive for a correct decision might increase accuracy motivation. On the contrary, we agree that the selection of decision strategies is the result of a trade-off between the desire to make a correct decision and the desire to minimize effort (cf. Payne et al., 1993). As a consequence of an increased benefit of making a correct decision people should be willing to put more effort into the decision-making process whereas monetary costs for information decrease the benefits of an extensive information search and should therefore reduce the requested information (e.g., Gilliland et al., 1993) – and indeed in our experiments participants overall adjusted the amount of information searched for accordingly. However, with regard to *biases* in information search and processing there are inconsistent findings in the literature. On the one hand accuracy

motivation decreases the confirmation bias (Lundgren & Prislin, 1998; Johnston, 1996), on the other hand increasing the stakes in decision problems sometimes leads people to become more rigid, overconfident and increases bias (Janis & Mann, 1977; Kunda, 1990; Sieber, 1974). A meta-analysis by Jenkins, Mitra, Gupta, and Shaw (1998) illustrates that incentives primarily motivate people to invest more effort in a task, but do not reliably lead to higher decision quality. Yet the decision-focus hypothesis provides an explanation: Even if an accuracy goal increases the desire to find the correct decision, at the same time it increases the decision's importance, leads to extensive thinking about the decision and thereby increases the decision's salience (Jenkins et al. 1998; Stone & Ziebart, 1995), which in turn can lead to more bias. Indeed, in former research perhaps when accuracy motivation decreased confirmation bias, an information focus was activated by telling participants that logic and reasoning abilities were examined (Lundgren & Prislin, 1998) or that they had to be as accurate in their perception as possible (Johnston, 1996).

Practical implications

To what extent is it possible to suggest interventions for practical decision-making when an open-minded handling of new information is important to prevent or correct bad decisions?⁸ As repeated thinking of the decision increases the confirmation bias one recommendation for decision-makers would be to distance themselves from their decision when searching and considering new information. To first get an overview over the available pieces of information before thinking of their implication might help here (see Jonas et al., 2001). It would also be useful to prevent early justifications for why one prefers a specific decision alternative. Remaining uncommitted as long as possible in the decision process enhances open-mindedness towards new information (see also

⁸ Given that our experiments were conducted in the tradition of former dissonance research on selective exposure (Frey, 1986), we asked our participants to make a preliminary decision before they searched for additional information. One might question to what extent this procedure fulfills external validity. However, we understand the process of making a decision as a continuum between generating a decision preference successively getting stronger, resulting first in a preliminary and later in a definite decision (cf. Svenson, 1992). During this process people can, at different points, search for new information. There are many situations in which people make a preliminary selection from a variety of possible options and then test the adequacy of their choice by searching for new information before making their final decision. Yet, Russo and colleagues showed that predecisional distortions occur even in the absence of any initial choice. Any leaning towards one alternative, regardless how tentative influenced the evaluation of subsequent information (Russo, Meloy & Medvec, 1998; Carlson & Russo, 2001).

Dailey, 1952, or Elstein, Shulman, & Sprafka, 1978). Dailey (1952), for example, illustrates that people make better judgments when they survey the data as a whole instead of pausing in between and drawing inferences from the segments they have surveyed so far.

Another lesson learned from the present experiments is to be careful when promising incentives for a correct decision. Because incentives inevitably lead people to think of a decision, incentive can induce bolstering of a decision by preferring supporting over conflicting information. It is therefore important to combine incentives with motivating decision-makers to shift their attention to the information search process. For example, instead of making people justify the decision results, one possibility would be to induce justification for the decision *process*. An information focus could also be induced by investing costs in the information search (money, effort, or reflecting on which information one wants to read). All these conditions seem to prevent people from easily adding supporting information. Thus, these are strategies that individually or in combination can increase information focus and minimize decision focus, thereby encouraging the consideration of conflicting information and facilitating optimal judgment and decision-making.

References

- Arbuckle, J. L. (2005). AMOS 6.0 User's Guide. Chicago, IL: SmallWaters.
- Brock, T. C. (1962). Cognitive restructuring and attitude change. Journal of Abnormal and Social Psychology, *64*, 264-271.
- Carlson, K. A., & Russo, J. E. (2001). Biased interpretation of evidence by mock jurors. Journal of Experimental Psychology: Applied, *2*, 91-103.
- Dailey, C. A. (1952). The effects of premature conclusion upon the acquisition of understanding of a person. The Journal of Psychology, *33*, 133-152.
- Darley, J. M, Fleming, J. H., Hilton, J. L., & Swann, W. B. Jr. (1988). Dispelling negative expectancies. Journal of Experimental Social Psychology, *24*, 19-36.
- Eisenhardt, K. M. (1989). Making fast strategic decisions in high-velocity environments. Academy of Management Journal, *32*, 543-576.
- Elstein, A. S., Shulman, L. S., & Sprafka, S. A. (1978). Medical problem solving: An analysis of clinical reasoning. Cambridge, MA: Harvard University Press.
- Festinger, L. (1957). A theory of cognitive dissonance. Stanford, CA: Stanford University Press.
- Festinger, L. (1964). Conflict, decision, and dissonance. Stanford, CA: Stanford University Press.
- Fischer, P., Jonas, E., Frey, D., & Schulz-Hardt, S. (2005). Selective exposure to information: The impact of information limits. European Journal of Social Psychology, *35*, 469-492.
- Ford, K. J., & Weldon, E. (1981). Forewarning and accountability: effects on memory-based interpersonal judgments. Personality and Social Psychology Bulletin, *7*, 264-268.
- Frey, D. (1981). Postdecisional preference for decision-relevant information as a function of the competence of its source and the degree of familiarity with this information. Journal of Experimental Social Psychology, *17*, 51-67.

Frey, D. (1986). Recent research on selective exposure to information. In L. Berkowitz (Ed.), Advances in Experimental Social Psychology (Vol. 19, pp.41-80). New York: Academic Press.

Frey, D., Schulz-Hardt, S., & Stahlberg, D. (1996). Information seeking among individuals and groups and possible consequences for decision-making in business and politics. In E. Witte & J. Davis (Eds.), Understanding group behavior, Vol. II: Small group processes and interpersonal relations (pp.211-225). Mahwah, NJ: Erlbaum.

Gilliland, S. W., Schmitt, N., & Wood, L. (1993). Cost-benefit determinants of decision process and accuracy. Organizational Behavior and Human Decision Processes, *56*, 308-330.

Janis, I. L., & Mann, L. (1977). Decision-making – A psychological analysis of conflict, choice, and commitment. New York: The Free Press.

Jenkins, G. D., Mitra, A., Gupta, N., & Shaw, J. D. (1998). Are financial incentives related to performance? A meta-analytic review of empirical research. Journal of Applied Psychology, *83*, 777-787.

Johnston, L. (1996). Resisting change: Information-seeking and stereotype change. European Journal of Social Psychology, *26*, 799-825.

Jonas, E., Schulz-Hardt, S., Frey, D., & Thelen, N. (2001). Confirmation bias in sequential information search after preliminary decisions: An expansion of dissonance theoretical research on “selective exposure to information”. Journal of Personality and Social Psychology, *80*, 557-571.

Kirk, R. E. (1995). Experimental design: Procedures for the behavioral sciences. Pacific Grove, CA: Brooks/Cole.

Kirschenbaum, S. S. (1992). Influence of experience on information-gathering strategies. Journal of Applied Psychology, *77*, 343-352.

Koriat, A., Lichtenstein, S., & Fischhoff, B. (1980). Reasons for confidence. Journal of Experimental Psychology: Human Learning and Memory, *6*, 107-118.

Kray, L. J., & Galinsky, A. D. (2003). The debiasing effect of counterfactual mind-sets:

Increasing the search for disconfirmatory information in group decisions. Organizational Behavior and Human Decision Processes, 91, 69-81.

Kunda, Z. (1990). The case for motivated reasoning. Psychological Bulletin, 108, 480-498.

Lundgren, S. R., & Prislin, R. (1998). Motivated cognitive processing and attitude change. Personality and Social Psychology Bulletin, 24, 715-726.

McAllister, D. W., Mitchell, T. R., & Beach, L. R. (1979). The contingency model for the selection of decision strategies: An empirical test of the effects of significance, accountability, and reversibility. Organizational Behavior and Human Performance, 24, 228-244.

Payne, J. W., Bettman, J. R., & Johnson, E. J. (1993). The adaptive decision maker. Cambridge, MA: University Press.

Pomerantz, E. M., Chaiken, S., & Tordesillas, R. S. (1995). Attitude strength and resistance processes. Journal of Personality and Social Psychology, 69, 408-419.

Pyszczynski, T., LaPrelle, J., & Greenberg, J. (1988). Encoding and retrieval effects of general person characterizations on memory for congruent and incongruent information. Personality and Social Psychology Bulletin, 13, 556-567.

Russo, J. E., Meloy, M. G., & Medvec, V. H. (1998). Predecisional distortion of product information. Journal of Marketing Research, 35, 438-452.

Schulz-Hardt, S., Frey, D., Lüthgens, C., & Moscovici, S. (2000). Biased information search in group decision making. Journal of Personality and Social Psychology, 78, 655-669.

Shrout, P. E., & Bolger, N. (2002). Mediation in experimental and nonexperimental studies: New procedures and recommendation. Psychological Methods, 7, 422-445.

Sieber, J. E. (1974). Effects of decision importance on ability to generate warranted subjective uncertainty. Journal of Personality and Social Psychology, 30, 688-694.

Sobel, M. E. (1982). Asymptotic intervals for indirect effects in structural equations models. In S. Leinhardt (Ed.), Sociological methodology 1982 (pp. 290-312). San Francisco: Jossey-Bass.

Stone, D. N., & Ziebart, D. A. (1995). A model of financial incentive effects in decision making. Organizational Behavior and Human Decision Processes, 61, 250-261.

Stone, J., Aronson, E., Grain, A. L., Winslow, M. P., & Fried, C. B. (1994). Inducing hypocrisy as a means of encouraging young adults to use condoms. Personality and Social Psychology Bulletin, 1, 116-128.

Svenson, O. (1992). Differentiation and consolidation theory of human decision making: A frame of reference for the study of pre- and post decision processes. Acta Psychologica, 80, 143-168.

Tesser, A., Martin, L., & Mendolia, M. (1995). The impact of thought on attitude extremity and attitude-behavior consistency. In R. E. Petty, & J. A. Krosnick (Eds.), Attitude strength: Antecedents and consequences (pp. 73-92). Mahwah, NJ: Erlbaum.

Zanna, M. P., Lepper, M. R., & Abelson, R. P. (1973). Attentional mechanisms in children's devaluation of a forbidden activity in a forced-compliance situation. Journal of Personality and Social Psychology, 28, 355-359.

Authors' Note

Eva Jonas, Department of Psychology, University of Salzburg, Austria. Eva Traut-Mattausch & Dieter Frey, Department of Psychology, Social Psychology, Ludwig-Maximilians-University, Munich, Germany. Jeff Greenberg, Department of Psychology, University of Arizona, Tucson, USA.

The research reported in this article was made possible by grants from the German Science Foundation (Deutsche Forschungsgemeinschaft [DFG]), project no. Fr. 472/16-1 and Jo. 388/1-1. We would like to thank Renate Lüthgen-Schmitt and Beate Hoffmann for their assistance in conducting Experiment 3. We are grateful to Mark Zanna and Verena Graupmann for their comments on an earlier version of this manuscript.

Correspondence concerning this manuscript should be addressed to: Eva Jonas, Department of Psychology, University of Salzburg, Hellbrunner Strasse 34, 5020 Salzburg, Austria, email: eva.jonas@sbg.ac.at.

Table 1:

Means and standard deviations (in brackets) for information search dependent on the information search mode in Experiment 1

	Reward for correct decision	
	No	Yes
Confirmation bias ^A	-0.08 (1.19) ^a	+1.00 (1.36) ^a
Supporting information	1.15 (1.07) ^b	2.00 (1.41) ^b
Conflicting information	1.23 (1.01)	1.00 (1.18) ^b
<u>n</u>	13	14

Notes:

^A The “confirmation bias” corresponds to the difference between the number of supporting and conflicting pieces of information chosen.

^{a,b} Numbers with the same subscript per row or column differ significantly from each other.

Table 2:

Means and standard deviations (in brackets) for information search dependent on the information search mode in Experiment 3

	Information search	
	free	0.50 DM (25 cent) for each piece of information
Confirmation bias ^A	+0.53 (0.92) ^a	-0.19 (1.05) ^a
Supporting information	2.20 (0.94) ^b	1.00 (0.82) ^b
Conflicting information	1.67 (1.23) ^b	1.19 (0.83)
<u>n</u>	15	16

Notes:

^A The “confirmation bias” corresponds to the difference between the number of supporting and conflicting pieces of information chosen.

^{a,b} Numbers with the same subscript per row or column differ significantly from each other.

Table 3:

Means and standard deviations (in brackets) for information search dependent on decision and information focus in Experiment 3

	No focus	Decision focus	Information focus
Confirmation bias ^A	+1.50 (2.01) ^a	+2.64 (1.58) ^a	+0.54 (1.45) ^a
Supporting information	2.81 (1.39) ^b	3.80 (1.32) ^b	2.27 (1.95) ^b
Conflicting information	1.31 (1.12) ^b	1.16 (1.03) ^b	1.73 (1.97)
Increase in commitment			
from the preliminary to the final decision ^a	+0.77 (1.84) ^c	+2.12 (2.39) ^{c,d}	+0.15 (1.29) ^d
<u>n</u>	26	25	26

Notes:

^A The “confirmation bias” corresponds to the difference between the number of supporting and conflicting pieces of information chosen.

^{a,b,c,d} Numbers with the same subscript per row or column differ significantly from each other.

Table 4:

Means and standard deviations (in brackets) for information search dependent on the information search mode in Experiment 4

	Reward for correct decision	
	No	Yes
Confirmation bias ^A	- 0.08 (1.66) ^a	+1.47 (2.18) ^a
Supporting information	2.61 (1.71)	3.47 (1.42) ^b
Conflicting information	2.69 (1.75)	2.00 (1.37) ^b
	(13)	(17)

Notes:

^A The “confirmation bias” corresponds to the difference between the number of supporting and conflicting pieces of information chosen.

^{a,b} Numbers with the same subscript per row or column differ significantly from each other.