Process Accountability as a De-Escalation Technique: How Time Moderates the Dual Role of Information Search

Klaus Moser

Friedrich-Alexander University Erlangen-Nürnberg

Hans-Georg Wolff

University of Cologne

Roman Soucek

Friedrich-Alexander University Erlangen-Nürnberg

Accepted Manuscript

Moser, K., Wolff, H.-G.,& Soucek, R. (in press). Process accountability as a de-escalation technique: How time moderates the dual role of information search. *Journal of Personnel Psychology*.

This research was supported by grants from the German Research Foundation to the first author.

Correspondence concerning this article should be addressed to Klaus Moser, Organizational and Social Psychology, Friedrich-Alexander University Erlangen-Nürnberg, Lange Gasse 20, 90403 Nürnberg, Germany, Email: klaus.moser@fau.de

Abstract

Escalation of commitment describes the continuation of a course of action despite drawbacks and increasing uncertainty of goal achievement. The present study improves our understanding of process accountability as a de-escalation technique. Because process accountability requires decision makers to base their decisions on the results of (hopefully unbiased) information, which in turn requires time to gather, the de-escalatory effect of process accountability is stronger during later stages of the escalation process. However, because time spent with information search creates commitment, the debiasing effect of process accountability on information search diminishes over time. Finally, consistent with the assumption of an increasingly stronger tunnel vision in escalation processes, the effects of biased information search on de-escalation are weaker during later stages.

Process Accountability as a De-Escalation Technique: How Time Moderates the Dual Role of Information Search

Escalation of commitment describes the phenomenon of adhering to a course of action even though negative feedback indicates failure. In the domains of business and economics, this can occur in a variety of situations, such as exploding costs of construction projects, continuing an investment in losing stocks, or retaining an underperforming employee (Staw, 1997). A considerable amount of research has investigated the determinants of escalating commitment (for a meta-analysis see Sleesman, Conlon, McNamara, & Miles, 2012), whereas only a small number of studies have identified factors that contribute to what has been termed *de-escalation of commitment* (Simonson & Staw, 1992). Contrary to a simple prevention of stepping into a losing course of action by a reversal of factors that initiate escalation, factors promoting de-escalation allow for the *discontinuation* of a losing course of action. This logic is similar, for example, to the fact that cure and causes of some illnesses must not be identical (e.g., genetic disorders such as phenylketonuria might be alleviated by dieting, but not dieting does not cause genetic disorders).

One important de-escalation technique is *process accountability* (PA), given its effectiveness as a debiasing technique in general (Lerner & Tetlock, 1999). In fact, Simonson and Staw (1992) found that PA promotes de-escalation of commitment. The current study intends to extend our knowledge on PA with respect to two aspects: We examine behavior as well as the role of cognitive processes and, drawing on Brockner and Rubin's (1985) notion of stages of escalation, we take the dynamic nature of escalation into account. Integrating these two points, we suggest that at early stages, PA will instigate unbiased processing, but not de-escalation. The (behavioral) de-escalating effect of PA will only occur at later stages, when

decision makers feel they have gathered enough information. First, Simonson and Staw (1992) proposed that PA leads to more accurate information processing, but they did not examine this assumption. It is, however, important to understand the cognitive processes related to de-escalation. For example, alternative explanations of the effects of PA could be that decision makers are confused and prefer to withdraw from an unpleasant decision situation, are less committed from the onset due to distrust in what will happen or even overhastily "give up" if they receive any negative information after a PA instruction. Therefore, it is valuable to analyze whether PA really instigates less biased cognitive processes. Second, the effectiveness of PA might differ depending on the nature of the decision scenario. Though escalation of commitment is a process and theories have described stages of this process (e.g., Brockner & Rubin, 1985; Staw, 1997), it has often been analyzed by rather static decision scenarios. For example, research has examined escalation through the analysis of *one* decision following *one* instance of negative feedback (e.g., Conlon & Parks, 1987; Simonson & Nye, 1992). This can be contrasted with dynamic decision scenarios that include repeated feedback and decisions. Dynamic decision scenarios have two important features: (1) Decision makers (DMs) can expect to learn more and therefore make more informed decisions if they continue their course of action, though (2) while sticking to their course of action in order to learn, DMs increase their behavioral commitment due to the (inevitable) continuation of their behavior. Consider the example of a supervisor (S) who is accountable for the onboarding process of a new employee (E). If S receives initial feedback about adaptation problems of E, S might doubt that this feedback is reliable and that there is enough information to fire E and to justify this decision to an audience. In order to gather more information on how E is adapting, the onboarding must continue which in turn means that during subsequent decision situations S has then to take into account information on his previous

behavioral commitment. This leads to the core question of the current research: Even if process accountability has a debiasing effect, is it strong enough to withstand the side effect: behavioral commitment necessary to satisfy the need to search for information?

In summary, we assume that cognitive processes change during escalating commitment. In early stages of the escalation process, information search bias should be less pronounced, and therefore promotes de-escalation of commitment. Though process accountability fosters unbiased information search, its effectiveness requires time to unfold and should be stronger at later stages.

Process Accountability, De-escalation and, Time

Accountability is defined as the expectation that decisions will be evaluated by others and that individuals have to give reasons for their decisions (Lerner & Tetlock, 1999). Effects of accountability are often difficult to predict, and prior research has reported that escalation as well as de-escalation may result (e.g., Fox & Staw, 1979). In fact, Simonson and Staw (1992) found that process accountability, *but not* outcome accountability, had a de-escalating effect, proposing processes of heightening "decision-making prowess" and increasing "cognitive vigilance" (p. 419), though they did not utilize measures of these cognitive processes. Accordingly, we assume that process accountability promotes de-escalation of commitment (Hypothesis 1a).

> Hypothesis 1a: Decision makers (DMs) under process accountability (PA) are more likely to abandon a losing course of action (i.e., de-escalate their commitment) than DMs with no PA.

Though we expect to find that PA will promote de-escalation, it will take some time. DMs have to stay committed to the course of action as long as they expect to gather additional valuable information in subsequent stages and continuation is the only chance to obtain additional information. Information search requires time, and thus, its very nature is part of the escalation process (Gilroy & Hantula, 2016). In fact, making information available contributes to escalation even when DMs consider the information to be useless (DiFonzo & Bordia, 1997) and those high in accountability might be even more vulnerable to this dilution effect (Tetlock & Boettger, 1989). Only at later stages in the decision process the accumulation of data indicates that feedback is reliable and trustworthy, and thus, diminishes the value of continued information search.

Remember again the example of S being accountable for onboarding E who turns out to perform below acceptable standards. S might have received negative feedback from the beginning, but decided to continue the employment relationship because this early feedback is considered as preliminary and unreliable. This is all the more true, if S experiences process accountability because the ability to present good reasons also depends on being well-informed about the process.

In sum, the effect of PA on de-escalation will be delayed until later stages in a decision process and therefore time moderates the effects of PA on de-escalation (Hypothesis 1b).

Hypothesis 1b: The effect of PA on de-escalation of commitment will be moderated by time, that is, it will be stronger at later stages.

Process Accountability, Bias in Information Search, and Time

In the current study, we focus on information search to examine biased information processing for two reasons. First, decision makers who are committed to a previous decision and who experience a drawback are susceptible to generate reasons that justify their position (defensive bolstering; Lerner & Tetlock, 1999) and can be expected to actively bias their information search. Of note is that the theory of dissonance is not only the basis of the self-justification hypothesis of escalating commitment (Brockner, 1992), but has inspired an important research stream on selective exposure to information (Frey, 1986; Jonas, Schulz-Hardt, Frey, & Thelen, 2001). Second, biased information search should be mitigated in case of process accountability because decision makers can be expected to "prepare themselves by […] self-critical search for reasons to justify their actions" (Lerner & Tetlock, 1999, p. 263).

PA has been hypothesized to lend to more self-critical search for information and cognitive vigilance (Lerner & Tetlock, 1999; Simonson & Staw, 1992). Given that the current study is primarily interested in information search bias, we assume less biased information search in DMs under PA (Hypothesis 2a).

Hypothesis 2a: DMs under PA will show less biased information search than DMs with no PA.

Moreover, scholars proposed that rational considerations predominate at the beginning of escalation situations, and self-justification motives increase over time (Staw, 1997). The *tunnel vision model* (Brockner & Rubin, 1985) distinguishes between early and late stages of the escalation process and predicts that economic considerations — for example, the probability of

goal attainment (Rubin & Brockner, 1975) or cost salience (Brockner et al., 1982) — play an important role in the initial stages of escalation (see also Wong, Kwong, & Ng, 2008), whereas at later stages, as decision makers become focused on the task itself, they become less vigilant in their search for additional information (Brockner et al., 1982), and self-justification increases (Brockner & Rubin, 1985; Tan & Yates, 2002; Moser, Wolff, & Kraft, 2013). Therefore, we assume that information search is more biased during later stages of the escalation process (Hypothesis 2b)

Hypothesis 2b: DMs will show more biased information search at later stages.

At later stages of escalation, biased information search will increase. There are two reasons why PA can be expected to lose its effectiveness as a debiasing technique. First, increasing the focus on the task itself (Brockner et al., 1982) distracts from information (e.g. negative feedback). Second, behavioral commitment increases and has to be justified (cf. “there must be a reason why I have continued”). These general processes interfere with the debiasing effect of accountability. Therefore, we assume that the debiasing effect of PA on information search (cf. Hypothesis 2a) should be stronger during early stages of escalation und thus time moderates the debiasing effect of PA (Hypothesis 2c).

Hypothesis 2c: The effect of PA on decreased biased information search will be stronger at early stages.

Bias in information search, de-escalation and time

Finally, previous research has found that continuation of escalation is related to increase in self-justification (Brockner, 1992) and fewer rational reasons (Moser et al., 2013). In turn, less biased information search should contribute to de-escalation (Hypothesis 3a).

> Hypothesis 3a: Less biased information search leads to de-escalation of commitment.

Again, the effect of less biased information search should be stronger during early stages of escalation. Biased information processing increases and reasons to *justify* the increasing behavioral commitment become important. The notion of a tunnel vision (Brockner & Rubin, 1985) means that DMs become increasingly unsusceptible to facts (Brockner et al., 1982), and therefore, the effects of bias in information search should decrease. In sum, time moderates the de-escalating effect of less biased information search (Hypothesis 3b).

> Hypothesis 3b: The effect of less biased information search on de-escalation of commitment will be stronger at early stages.

In order to investigate the effects of PA on de-escalation, the role of information search bias, and their interactions with time, we use a laboratory simulation study where participants work on a business case in a personnel decision scenario.

Method

Sample

A total of 93 participants (university students from psychology and business departments; M_{age} = 22.2 years, *SD* = 2.8; 49 % female; 36% with at least some job experience) were recruited for an "experiment on decision making" and randomly assigned to one of three experimental conditions. Based upon answers in a post-experimental questionnaire, we used data from *N* = 76 participants, excluding twelve participants who indicated they had previously participated in a similar study and another five participants who indicated they did not understand all of the words of the scenario (mostly exchange students; we considered it unethical to preclude their participation in advance). Participants were either paid €5 (approx. US$6) or received course credits for participation.

Procedure

Upon entering the laboratory, participants were seated at individual cubicles and worked on a computer-based decision scenario. Instructions were presented using a personal computer, and participants were told that an experimenter would be available in case of additional questions. Manipulation check items were presented in the introduction section as well as at the end of the scenario. Following the decision scenario, participants completed a post-experimental questionnaire (assessing, e.g., language problems, participation in similar studies, guess of study aim). Finally, participants left their email address and were debriefed by email at the end of the entire study. It took participants about 45 minutes to complete the experiment.

In the scenario, participants assumed the role of a manager in a chemical manufacturing company. An introduction section provided participants with information about their position, their job, and the company. The focal task in the experiment was mentoring a trainee (named

Max Mayer) during a 22-month high potential program (for a similar scenario see, e.g., Schoorman, 1988). Participants were told that they would receive information on their trainee in the form of a personal diary and that they would have to decide whether to keep, dismiss, or transfer the trainee to another department of the company. Dismissal as well as transferal represent two alternatives to discontinuing mentoring of the trainee (i.e., both decisions indicate de-escalation) and we collapsed these two exit options in our analyses. The introduction section also contained the experimental manipulations, which will be described further below.

After participants completed the introduction section, they started working through the diary. The diary consisted of eight stages each starting with a summary screen that provided participants with an overview of five to six information items available. This screen was designed similar to an email inbox; that is, every information item was briefly designated by medium (e.g., email, personal memo), sender (e.g., Ms. Schick), and a brief title of its content. Similar to studies on selective exposure to information (e.g., Jonas et al., 2001), this title conveyed information on the specific content and the valence of the information item. Item titles were specifically designed and pretested to represent feedback on the trainee, and most of them were negative (e.g., "Mayer's report still missing"). Note that escalation situations by definition require negative feedback and therefore we presented predominantly negative information items to participants. To ensure equivocality of the feedback (Bowen, 1987), at each stage we included one or two positive (e.g., "good start in sales department") or neutral items (e.g., "Mayer scheduled to move to next division").

From this summary screen, participants were able to either move on to decide upon the trainee or to access the full information of the items. The full information item was then presented on the screen, and after reading participants had to click a "finished" button to return

to the summary screen. They were then able to choose whether to access another information item or to make a decision regarding the trainee. We allowed repeated access to information items; however, participants were limited to a maximum of ten requests. If participants wanted to decide, they clicked a "decision" button on the summary screen and were forwarded to the decision screen. On this decision screen, participants decided whether to keep, dismiss, or transfer the trainee. If participants kept the trainee they moved on to the next stage which, again, started with a summary screen. If they decided to dismiss or transfer the trainee they worked on an alternative task to keep time in the experiment at a comparable length.

Experimental Conditions

There are two main approaches to gaining assurance that a specific scenario is prone to escalation of commitment (Moser et al., 2013). According to the first approach, escalation situations involve four features of a decision making situation (e.g., Staw, 1997): (1) initial investment of time, money, or effort, (2) subsequent negative feedback with regard to goal attainment, and (3) goal attainment remains uncertain in the future and additional investments might either lead to goal attainment, or will be lost. In this situation, decision makers must (4) decide (again) between investing further resources and abandoning their course of action, thereby losing prior investments. In a second approach, researchers introduce an experimental manipulation that presumably does not allow alternative "rational" explanations for the behavior of those who continue a losing course of action. The most prominent manipulation either allows participants to choose the initial course of action or informs them that another person (e.g., their predecessor) has initiated an endeavor. Scholars have suggested that this manipulation of initial choice, also labelled the *responsibility effect*,[1] provides a 'proof' of the validity of escalation

paradigms (e.g., Simonson & Staw, 1992). This *choice condition* will serve as a baseline against which the effectiveness of a de-escalation technique can be compared.

We used three experimental conditions manipulating choice and PA. In the first condition (labelled control condition) neither choice nor accountability was induced. In the second condition (choice condition), participants were exposed to the choice manipulation but were not held accountable for their decisions. In the third condition (PA condition), participants were exposed to both choice as well as the PA manipulation. Both manipulations of choice as well as PA were part of the introduction section of the decision case.

Manipulation of Choice. Choice was manipulated by informing participants in the control condition that the trainee had been selected by a committee from the HR department versus informing participants they personally had chosen the trainee themselves in the choice and PA conditions. According to the meta-analysis by Sleesman et al. (2012), this tell-style manipulation choice works as good as an actual manipulation of choice.

Manipulation of Process Accountability. The condition of process accountability included the choice manipulation as described above. In addition, we used the following wording to induce process accountability in participants:

> Your task is to make good decisions. You are expected to carefully gather information and deliberate on the arguments for the decision options. With such professional behavior you support the trainee during the program.
>
> In a final step of the decision case you will be asked to explain the quality of your decision processes to an expert committee. The committee is composed of several highly qualified members of the HR Headquarter. They are primarily interested in highly professional decisions during the training program. The committee

considers you as the person that is in the best position to evaluate the developmental progress of the trainee. A typical question might be: "Which principles have directed your activities during the training program?"

Dependent Variables

Escalation. We measured escalation by assessing how long participants persisted, that is, how often they decided over the eight stages of the scenario to keep the trainee. Participants escalate their commitment the longer they persist. This variable ranges from 1 (indicating immediate dismissal/transfer following negative feedback) to 9 (indicating participants persisted up to the end of the decision scenario).

Computation of information search bias. We logged the valence of the requested full information items presented at the summary screen and computed a measure of information bias based upon the information requested relative to the available information, because more negative than positive information was presented to induce negative feedback. Specifically, we counted the sum of negative (g_{neg}), positive (g_{pos}), and neutral (g_{neu}) full information screens requested at each stage. We then computed the difference between the positive and negative information requested, weighting positive requested in accordance with its total availability. Finally, we "penalized" the request of neutral information by subtracting a weighted count of information requests. This reduces bias to some extent when neutral information is requested.

$$\text{Bias} = w * n_{pos} - n_{neg} - \text{sgn}\left[w * n_{pos} - n_{neg}\right] * n_{neu} * 0{,}5; \qquad \text{if } w * n_{pos} - n_{neg} \neq 0,$$

$$\text{Bias} = 0; \qquad \text{if } w * n_{pos} - n_{neg} = 0$$

$$\text{with: } w = \frac{g_{neg}}{g_{pos}},\ n = \text{amount of information requested},\ g = \text{amount of information available.}$$

This yields a measure with zero indicating an unbiased request, relative to the information available, and positive and negative values indicate a positive or negative bias relative to the information available. In addition, the bias is smaller (i.e., closer to zero) if neutral information is requested. In the current study on escalation processes, bias in information search means that information is preferred consistent with the initial decision. Hence, we are primarily interested in the extent of decision makers' *positive* bias in information search.

Analyses

In accordance with prior research on the process of escalation (e.g., Bragger Hantula, Bragger, Kirnan, & Kutcher, 2003; McCain, 1986; Moser et al., 2013; Wolff & Moser, 2008), we used event history analysis. Specifically, we employed discrete time logit analysis (Allison, 1982; Vermunt, 1997) that models the probability of keeping vs. dismissing/transferring the trainee at stage *t*, conditional upon the fact that participants had kept the trainee up to stage *t*. Discrete time logit analysis allows for the incorporation of several independent variables similar to hierarchical regression analysis. Hypotheses were examined in a stepwise manner. In the first step, time was entered as a control variable. We examined models with linear, quadratic, or cubic effects of time and used the best fitting model in step two, where we entered effects of choice and accountability on escalation. Because we were interested in testing specific configurations of effects, we used planned contrasts (Rosenthal, Rosnow, & Rubin, 2000). Models were compared by means of the log-likelihood ratio test (*LR*), which determines whether the inclusion of additional parameters leads to a significant increase in model fit (Cohen, Cohen, West, & Aiken, 2003). We also computed effect sizes for model comparisons using log-likelihood ratio tests, where $w = 0.10$ $w = 0.30$ $w = 0.50$ indicate small, medium, and large effects, respectively

(Cohen, 1988). With 339 observations (i.e. decisions on persistence vs. exit), the power of our discrete time logit analyses to detect small effects is 0.45, the power to detect medium effects is 0.99.

Results

Manipulation Checks

In comparison to the no choice condition, participants in the choice condition and the PA condition (also including a choice manipulation) showed higher agreement to items indicating that this had been their own choice (prior to start of scenario: $M = 5.53$, $SD = 2.11$ vs. $M = 2.08$, $SD = 2.08$; $t(74) = 6.73$, $p < .01$; after completion of scenario: $M = 5.39$, $SD = 2.20$ vs. $M = 2.04$, $SD = 1.95$; $t(74) = 6.47$, $p < .01$), and that they themselves had decided which trainee they wanted to supervise (prior to start of scenario: $M = 5.10$, $SD = 2.29$ vs. $M = 1.76$, $SD = 1.69$; $t(74) = 6.46$, $p < .01$; after completion of scenario: $M = 4.94$, $SD = 2.41$ vs. $M = 1.60$, $SD = 1.44$; $t(74) = 6.38$, $p < .01$). Also, participants in the PA condition indicated higher agreement that they were to justify their decisions (prior to start of scenario: $M = 4.81$, $SD = 2.12$ vs. $M = 2.66$, $SD = 1.86$; $t(74) = 4.56$, $p < .01$; after completion of scenario: $M = 5.19$, $SD = 2.02$ vs. $M = 3.04$, $SD = 1.97$; $t(74) = 4.48$, $p < .01$), that they would have to explain how they arrived at their decisions (prior to start of scenario: $M = 6.04$, $SD = 1.22$ vs. $M = 3.42$, $SD = 1.73$; $t(74) = 6.88$, $p < .01$; after completion of scenario: $M = 6.19$, $SD = 0.94$ vs. $M = 3.40$, $SD = 1.80$; $t(74) = 7.40$, $p < .01$), and that they would have to present reasons for their actions (prior to start of scenario: $M = 6.00$, $SD = 1.47$ vs. $M = 3.68$, $SD = 1.86$; $t(74) = 5.53$, $p < .01$; after completion of scenario: $M = 6.19$, $SD = 0.94$ vs. $M = 3.62$, $SD = 1.99$; $t(74) = 6.23$, $p < .01$). In sum, these results suggest that our manipulations have been successful.

Table 1 reports descriptive statistics for persistence and bias. On average, participants persisted until the fourth stage. Consistent with expectations, participants in the choice condition (with choice, but no accountability) persisted longest. The grand mean of the biased information search measure across experimental conditions was negative, indicating that participants were relatively more likely to request negative information. This result confirms recent research that information search in escalation paradigms is not overwhelmingly biased in a positive direction (Schultze, Pfeiffer, & Schulz-Hardt, 2012). Participants in the PA condition (with choice and process accountability) showed the most negative (disconfirming) processing of information.

< Table 1. about here >

Analysis of Exit Decisions

In order to test whether time moderates the de-escalatory effect of PA (Hypotheses 1a and 1b), we examined six models by means of discrete time logit analysis (see M1 to M6 in Table 2). Time and the experimental conditions (combinations of choice and accountability) served as independent variables, and the conditional probability of persistence at a decision stage was the dependent variable. Note that positive coefficients denoted a higher probability to persist and thus to escalate. For each model, the *-2LL* fit index as well as unstandardized regression coefficients (*b*) from discrete time logit analyses are presented. Model 1 (M1) served as a baseline and contained a regression constant and a linear effect of time (quadratic, cubic, or no effects of time did not provide better fit). According to this model, the conditional probability to persist decreased linearly over time, $b = -0.19$, $p < .01$. In Model 2 (M2), we added two dummy parameters contrasting the control condition (first main effect) and the process accountability

condition (second main effect) with the choice condition, which served as a reference condition for de-escalation. This model marginally improved fit when compared to Model 1 (M1 vs. M2: $LR = 5.07$; $df = 2$; $p = .08$; $w = 0.12$). More importantly, regression parameters indicated a significant choice effect in the conditions without accountability (i.e., control vs. choice condition), $b = -0.78$, $p = .03$, replicating the classical choice effect and providing evidence for the validity of our paradigm.

We further used planned contrasts (Rosenthal et al., 2000) in Model 3 (M3) and Model 4 (M4). Model 3 included a comparison between the choice condition and the two other conditions (control condition and PA condition, Contrast 1 in Table 2). The positive effect of Contrast 1, $b = 0.37$, $p = .07$, indicated that persistence is more likely in the choice condition compared to the two other conditions; model fit improved marginally (M1 vs. M3: $LR = 3.35$; $df = 1$; $p = .07$; $w = 0.10$). In Model 4, we used ordinal contrast modeling (i.e., an ordinal succession of the three conditions, Contrast 2 in Table 2) where participants in the control conditions exit first, followed by participants in the PA condition, and where participants in the choice condition persist longest. Contrast 2 yields a positive effect, $b = 0.39$, $p = .03$; this model significantly improved model fit (M1 vs. M4: $LR = 5.05$; $df = 1$; $p = .02$; $w = 0.12$). In sum, in agreement with Hypothesis 1a, there is a de-escalating effect of PA.

Finally, we used the median time of exit of the control group (i.e., the third stage) to define early and late stages, as the choice of experimental manipulations was expected to influence escalation and thus the overall median (Wolff & Moser, 2008; for further arguments on the importance of three repeated signals in the same direction, e.g., three times negative feedback, see Carlson & Shu, 2007). Model 5 (M5) used Contrast 1 at late stages only, indicating a positive effect on persistence, $b = 1.00$, $p = .03$. In this case, the contrast significantly improved

model fit (M1 vs. M5: $LR = 5.47$; $df = 1$; $p = .02$; $w = 0.13$). Model 6 (M6) used Contrast 2 at late stages only, $b = 0.51$, $p = .04$, which also improved fit significantly (M1 vs. M6: $LR = 4.23$; $df = 1$; $p = .04$; $w = 0.11$). In sum, in agreement with Hypothesis 1b, the de-escalating effect of process accountability is stronger at late stages of the decision scenario.

< Table 2. about here >

Analysis of Biased Information Search

The tests of the interplay of biased information search and time are based on the assumption that positive bias increases over time. Figure 1 shows the information search bias for the three experimental conditions at early and late stages. In all conditions, participants exhibited a negative bias during early decision stages. More importantly, participants biased their information search in a positive manner during late stages, which was first and foremost true for the control and choice conditions.

< Figure 1 about here >

To further examine the development of information search bias, we used a discrete time logit analysis. As this type of analysis requires categorical dependent variables, we trichotomized the bias measure into categories of negative bias (i.e., bias < 0), unbiased search of information (i.e., bias = 0), and positive bias (i.e., bias > 0). Table 3 shows the results from this analysis. Similar to multinomial regression analysis, the model includes two coefficients for each variable using the category of unbiased processing as a reference category. Thus, one coefficient represents the likelihood of a negative bias in comparison to unbiased processing and one

coefficient represents the likelihood of a positive bias in comparison to unbiased processing. Model 1 (M1) includes two intercepts that model the general distribution of information search bias across all stages. Both coefficients were negative, indicating that unbiased processing occurs more often than either negatively or positively biased processing, $b = -1.26$, $p < .01$, respectively, $b = -1.41$, $p < .01$. Model 2 (M2) uses two coefficients to distinguish biased processing at late versus early stages. The coefficient for the negative bias was negative and marginally significant, $b = -0.56$, $p = .08$, indicating a tendency to exhibit negatively biased processing more likely at early stages rather than at late stages. More importantly, the coefficient for the positive bias was positive and significant, $b = 0.74$, $p = .02$, which indicated that positively biased processing is more likely at late stages compared to early stages, confirming Hypothesis 2b. To summarize, the models provided evidence that a negative bias is more likely at early stages, whereas a positive bias is more likely at late stages.

Model 3 (M3) included coefficients for the experimental conditions, which showed a marginally significant effect of choice, $b = -0.67$, $p = .07$, that was due to a lower tendency to exhibit a positive bias in the control condition as compared to the choice condition. More importantly, under process accountability a positive bias is less likely compared to the choice condition, $b = -1.35$, $p < .01$, confirming Hypothesis 2a. Note that controlling for experimental conditions in Model 3 did not change the effect of time on bias in information search.

< Table 3 about here >

Hypothesis 2c predicts that an interaction of time and experimental conditions affects biased processing. Model 4 (M4) in Table 3 shows a marginally significant effect on positively

biased processing at early (but not late) stages in the choice condition compared to the control condition, b = -1.04, p = .05. In addition, time also moderated the effect of process accountability compared to the choice condition especially for early stages, b = -1.90, p < .01. In Model 5 (M5), we excluded effects at later stages (see Cohen et al., 2003, p. 372, on modeling the highest interaction term of categorical variables). Most importantly, in comparison to the full interaction in Model 4, the restricted Model 5 did not fit worse (M4 vs. M5: LR = 3.63; df = 4; p = .46; w = 0.10). Since individuals in the PA condition were less likely to show biased processing at early stages, Hypothesis 2c was confirmed.

Hypothesis 3a predicts that positive bias will lead to escalation, and Hypothesis 3b assumes that this effect will be moderated by time. According to Table 2, Model 7 (M7) reports a main effect for information search bias, b = 0.28, p = .01, which confirms Hypothesis 3a. More importantly, according to Model 8 (M8), this effect was stronger for earlier points in time, b = 0.51, p < .01, as predicted by Hypothesis 3b. Finally, statistical control of experimental conditions in Model 9 (M9) did not change the results, b = 0.53, p < .01. To sum up, less information search bias has a de-escalatory effect and this effect is stronger at early stages in the escalation process.

Discussion

Process accountability (PA) is a promising de-escalation technique given its effectiveness as a debiasing technique in general (Lerner & Tetlock, 1999). Though preliminary research found that PA promotes de-escalation of commitment (Simonson & Staw, 1992), two caveats raise doubts concerning both its strength and the underlying cognitive process. First, an important feature of escalating commitment is its dynamic character. Escalation should be

considered as a process that consists of reactions to repeated negative feedback and that unfolds over time. Accordingly, recent studies have begun to explore escalation within dynamic paradigms with repeated instances of negative feedback (e.g., Bragger et al., 2003; Moser et al., 2013). Second, even these studies have mostly observed only behavioral indicators of escalation, and have rarely examined the accompanying cognitive processes as well as their development over time (for exceptions see Brockner & Rubin, 1985; Moser et al., 2013). In fact, we uphold the notion of Brockner and Rubin (1985), who wrote that while the experimental technique has identified several factors that "bear upon the causes of entrapment, it is less informative about the process itself" (p. 145). Therefore, one important contribution of our study has been to analyze the development of information processing over time as well as to analyze how it is related to escalation and de-escalation of commitment.

The current research was motivated by the notion that a thorough analysis of cognitive processes presumably triggered by process accountability (Lerner & Tetlock, 1999) improves our understanding of the conditions under which de-escalation occurs. This should be done in paradigms that allow repeated decisions because (1) only then we can analyze a real escalation *process*, because (2) it "creates time" that is necessary for the development of a tunnel vision (Brockner & Rubin, 1985), because (3) this is the precondition that DMs can expect to learn more about the problem at hand if they continue, and because (4) it generates behavioral commitment as well as the awareness of this commitment ("I have now decided in favor of this option for several times"; cf. Bem, 1972).

Consistent with expectations, we found that process accountability works as intended: It prevents further escalation. In addition, it seems also to trigger the expected debiasing processes. However, and more importantly, a consideration of the dual nature of information search can be

used to predict time-dependent effects of process accountability. For example, continuation of a stream of action is not only a sign of escalating commitment but also a means to gather data in order to learn more about an issue (Bragger et al., 2003). More specifically, DMs can expect to learn more and therefore make more informed decisions if they continue their course of action instead of maybe prematurely quit the situation. Therefore, de-escalatory effects of process accountability on the behavioral level are stronger during later stages of the decision process. However, while sticking to their course of action in order to learn, DMs increase their behavioral commitment due to the (inevitable) continuation of their behavior. Because accountable DMs are expected to "rationally" take all available information into account, they should also include into account that they repeated their commitment. In fact, both the effects of process accountability on (less) biased information search and of (less) biased information search on de-escalation are stronger during earlier stages of the decision process. Process accountability seems not being able to make cognitive processes completely immune against the development of a "tunnel vision". A general increase in biased information search at later stages seems to be the rule, further strengthening the self-justification account of escalation behavior.

The current research also extends our understanding of selective exposure in information seeking. A recent meta-analysis found that selective exposure is modest in size (Hart, Albarracín, Eagly, Brechan, Lindberg, & Merrill,, 2009), though participants select uncongenial information if it is valuable for pursuing a current goal. In addition, a recent study even concluded that information search bias is unlikely in escalation paradigms (Schultze et al., 2012). This might be, however, explained by the less dynamic scenarios in the Schultze et al. (2012) studies. In fact, we found both a lack of positive information search bias in early stages and evidence for an increase of bias in information search over time. This moderating effect is also in line with

theoretical assumptions that social factors (Staw & Ross, 1987) or non-economic concerns (Brockner & Rubin, 1985) become more important at late stages of the escalation process.

Limitations

Escalation, as well as de-escalation, can be examined in different contexts. In accordance with prior studies (e.g., Staw, 1976; Simonson & Staw, 1992; Bragger et al., 2003), we used an experimental scenario where participants assumed the role of a decision maker. Though we clearly acknowledge the relevance of field settings, we decided to use a laboratory study because we intended to examine repeated decisions as well as the accompanying cognitive processes in a controlled setting. This was also necessary to prove a methodological strength of our study: the use of discrete time logit analysis. This analysis allowed us to compare information search bias at early and late stages of the escalation process. Also, by modeling interactions of independent variables with time, we obtained further insight into the "importance of timing" (Brockner et al., 1982, p. 247) in the progression of escalation.

Contrary to the majority of previous research on escalating commitment, our scenario did not incorporate information on money (e.g., previous investments, budgets, etc.). The main reason for developing such a scenario was to present a setting in which the lack of concrete monetary information is plausible. The scenario makes it less probable that some well-educated participants will remember formal decision rules from their previously attended university courses (such as "ignore sunk cost"; Lerner & Tetlock, 1999), though we cannot completely rule out that participants had set their own limits (e.g., "I will fire him whenever I hear something negative"). In addition, personnel decisions are clearly relevant for the future of organizations (for example, more than 60 percent of the total costs in advanced economies are typically

compensation costs, Gerhart & Rynes, 2003) and informal pretests confirmed that participants feel quite involved in this kind of role playing scenario. Nevertheless, analyzing the role of information search over time in escalation situations is a promising line for future research.

Conclusions

The current study has shown that understanding the effects of process accountability can be considerably improved by examining the "importance of timing" (Brockner et al., 1982 p. 247) in the course of escalation and de-escalation. Process accountability not only improves a "soundly derived decision" but also often requires to stick to a project until enough information has been gathered which however in turn can yield further fruits for self-justification and hence escalation. In a nutshell, even unbiased information search can both promote de-escalation and escalation.

References

Allison, P. D. (1982). Discrete-time methods for the analysis of event histories. In S. Leinhardt (Ed.), *Sociological Methodology* (pp. 61–98). San Francisco: Jossey-Bass.

Bem, D. J. (1972). Self-perception theory. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (pp. 1–62). New York: Academic Press

Bowen, M. G. (1987). The escalation phenomenon reconsidered: Decision dilemmas or decision errors? *Academy of Management Review*, *12*, 52–66.

Bragger, J. L. D., Hantula, D. A., Bragger, D., Kirnan, J., & Kutcher, E. (2003). When success breeds failure: History, hysteresis, and delayed exit decisions. *Journal of Applied Psychology*, *88*, 6–14.

Brockner, J. (1992). The escalation of commitment to a failing course of action: Toward theoretical progress. *Academy of Management Review*, *17*, 39–61.

Brockner, J., & Rubin, J. Z. (1985). *Entrapment in escalating conflicts*. New York: Springer.

Brockner, J., Rubin, D. B., Fine, J., Hamilton, T., Thomas, B., & Turetsky, B. (1982). Factors affecting entrapment in escalating conflicts: The importance of timing. *Journal of Research in Personality*, *16*, 247–266.

Carlson, K. A., & Shu, S. B. (2007). The rule of three: How the third event signals the emergence of a streak. *Organizational Behavior and Human Decision Processes*, *104*, 113–121.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.

Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences* (3rd ed.). Mahwah, NJ: Erlbaum.

Conlon, E. J., & Parks, J. M. (1987). Information requests in the context of escalation. *Journal of Applied Psychology*, *72*, 344–350.

DiFonzo, N., & Bordia, P. (1997). Rumor and prediction: Making sense (but losing dollars) in the stock market. *Organizational Behavior and Human Decision Processes*, *71*, 329–337.

Fox, F. V., & Staw, B. M. (1979). The trapped administrator: Effects of job insecurity and policy resistance upon commitment to a course of action. *Administrative Science Quarterly*, *24*, 449–471.

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.

Gerhart, B., & Rynes, S. L. (2003). *Compensation. Theory, evidence, and strategic implications*. Thousand Oaks, Ca: Sage.

Gilroy, S. P., & Hantula, D. A. (2016). Inherently irrational? A computational model of escalation of commitment as Bayesian Updating. *Behavioural Processes*, *127*, 43-51.

Hart, W., Albarracín, D., Eagly, A. H., Brechan, I., Lindberg, M. J., & Merrill, L. (2009). Feeling validated versus being correct: A meta-analysis of selective exposure to information. *Psychological Bulletin*, *135*, 555–588.

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.

Lerner, J. S., & Tetlock, P. E. (1999). Accounting for the effects of accountability. *Psychological Bulletin*, *125*, 255–275.

McCain, B. E. (1986). Continuing investment under conditions of failure: A laboratory study of the limits to escalation. *Journal of Applied Psychology*, *71*, 280–284.

Moser, K., Wolff, H.-G., & Kraft, A. (2013). The de-escalation of commitment through predecisional accountability. *Journal of Applied Social Psychology, 43,* 363-376.

Rosenthal, R., Rosnow, R. L., & Rubin, D. B. (2000). *Contrasts and effect sizes in behavioral research: A correlational approach.* Cambridge, England: Cambridge University Press.

Rubin, J. Z., & Brockner, J. (1975). Factors affecting entrapment in waiting situations: The Rosencrantz and Guildenstern effect. *Journal of Personality and Social Psychology*, *31*, 1054–1063.

Schoorman, F. D. (1988). Escalation bias in performance appraisals: An unintended consequence of supervisor participation in hiring decisions. *Journal of Applied Psychology*, *73*, 58–62.

Schultze, T., Pfeiffer, F., & Schulz-Hardt, S. (2012). Biased information processing in the escalation paradigm: Information search and information evaluation as potential mediators of escalating commitment. *Journal of Applied Psychology*, *97*, 16–32.

Simonson, I., & Nye, P. (1992). The effect of accountability on susceptibility to decision errors. *Organizational Behavior and Human Decision Processes*, *51*, 416–446.

Simonson, I., & Staw, B. M. (1992). Deescalation strategies: A comparison of techniques for reducing commitment to losing courses of action. *Journal of Applied Psychology*, *77*, 419–426.

Sleesman, D. J., Conlon, D. E., McNamara, G., & Miles, J. E. (2012). Cleaning up the big muddy: A meta-analytic review of the determinants of escalation of commitment. *Academy of Management Journal*, *55*, 541–562.

Staw, B. M. (1976). Knee-deep in the big muddy: A study of escalating commitment to a chosen course of action. *Organizational Behavior and Human Decision Processes*, *16*, 27–44.

Staw, B. M. (1997). The escalation of commitment: An update and appraisal. In Z. Shapira (Ed.), *Organizational decision making* (pp. 191–215). New York: Cambridge University Press.

Staw, B. M., & Ross, J. (1987). Behavior in escalation situations: Antecedents, prototypes, and solutions. *Research in Organizational Behavior*, *9*, 39–78.

Tan, H.-T., & Yates, J. F. (2002). Financial budgets and escalation effects. *Organizational Behavior and Human Decision Processes*, *87*, 300–322.

Tetlock, P. E., & Boettger, R. (1989). Accountability: A social magnifier of the dilution effect. *Journal of Personality and Social Psychology, 57*, 388–398.

Vermunt, J. K. (1997). *Log-linear models for event histories*. Thousand Oaks, CA: Sage.

Wolff, H.-G., & Moser, K. (2008). Choice, accountability, and effortful processing in escalation situations. *Journal of Psychology*, *216*, 235–243.

Wong, K. F. E., Kwong, J. Y. Y., & Ng, C. K. (2008). When thinking rationally increases biases: the role of rational thinking style in escalation of commitment. *Applied Psychology: An International Review*, *57*, 245–271.

Footnotes

[1]While previous research used the term *responsibility*, we prefer the term *choice* because "responsibility" confounds a specific explanation for the effect of choice with an experimental manipulation that is typically used. In fact, there exist both arguments for self-justification (Sleesman et al., 2012) and preference effects (Schultz-Hardt et al., 2009) as an explanation for this choice effect.

Table 1

Descriptive Statistics of Study Variables

	N	*M*	*SD*
Persistence[a]			
Control condition	25	3.88	2.24
Choice condition	25	5.12	2.93
PA condition	26	4.73	2.32
Total	76	4.58	2.54
Biased information search[b]			
Control condition	25	-0.17	0.80
Choice condition	25	-0.04	0.58
PA condition	26	-0.43	0.89
Total	76	-0.22	0.77

Note. PA = Process Accountability condition that also includes a choice manipulation. [a] Mean values for persistence were calculated by assigning a value of 9 to participants who persisted to the end of the scenario. [b] Positive and negative numbers indicate relative preferences for positive and negative information items, respectively.

Table 2

Discrete Time Logit Analysis: Effects of Time, Experimental Conditions, and Biased Processing on Escalation

	M1	M2	M3	M4	M5	M6	M7	M8	M9
Constant	1.88**	2.30**	1.92**	1.93**	1.94**	1.91**	2.02**	2.16**	2.59**
Time (linear effect)	-0.19**	-0.21**	-0.20**	-0.21**	-0.27**	-0.20**	-0.22**	-0.25**	-0.27**
Main effects									
Control vs. choice condition		-0.78*							-0.83*
PA vs. choice condition		-0.35							-0.30
Planned contrasts									
Contrast 1 (Choice vs. control and PA condition)			0.37^{+}						
Contrast 2 (Control < PA < choice condition)				0.39*					
Time dependent effects									
Contrast 1 late stages (Choice vs. control and PA condition)					1.00*				
Contrast 2 late stages (Control < PA < choice condition)						0.51*			
Biased information search									
Main effect bias							0.28*		
Bias (early stages)								0.51**	0.53**
Bias (late stages)								0.12	0.11
-2LL	328.92	323.85	325.57	323.87	323.45	324.69	322.03	318.59	313.05
Npar	2	4	3	3	3	3	3	4	6

Note. $N = 339$ observations. PA = Process Accountability. Early and late stages refer to stages 1-3 and 4-8, respectively. Contrast codes, referring to control, choice, and PA conditions, respectively: Contrast 1 = -0.5; 1; -0.5. Contrast 2 = -1; 1; 0. $^{+}$ $p < .10$ * $p < .05$; ** $p < .01$

Table 3

Discrete Time Logit Analysis: Effects of Time and Experimental Conditions on Biased Information Search

	M1		M2		M3		M4		M5	
	Negative	Positive	Negative	Positive	Negative	Positive	Negative	Positive	Negative	Positive
Constant	-1.26**	-1.41**	-1.08**	-1.77**	-0.84**	-1.19**	-0.78**	-0.97**	-0.78**	-0.97**
Time (late stages)			-0.56^{+}	0.74*	-0.57^{+}	0.71*	-0.71	0.31	-0.86*	-0.06
Main effects										
Control vs. choice condition					-0.36	-0.67^{+}				
PA vs. choice condition					-0.35	-1.35**				
Time dependent effects										
Control vs. choice condition (early stages)							-0.46	-1.04^{+}	-0.46	-1.04^{+}
Control vs. choice condition (late stages)							-0.17	-0.30		
PA vs. choice condition (early stages)							-0.42	-1.90**	-0.42	-1.90**
PA vs. choice condition (late stages)							-0.28	-0.95^{+}		
-2LL	71.63		60.26		47.16		45.37		49.00	
Npar	2		4		8		12		8	

Note. N = 339 observations. Dependent variable is trichotomous and the models show coefficients for negative bias (bias < 0) and positive bias (bias > 0), whereas unbiased processing (bias = 0) is used as reference category. PA = Process Accountability condition that also includes a choice manipulation. Early stages refer to stages 1-3. $^{+}$ $p < .10$; * $p < .05$; ** $p < .01$

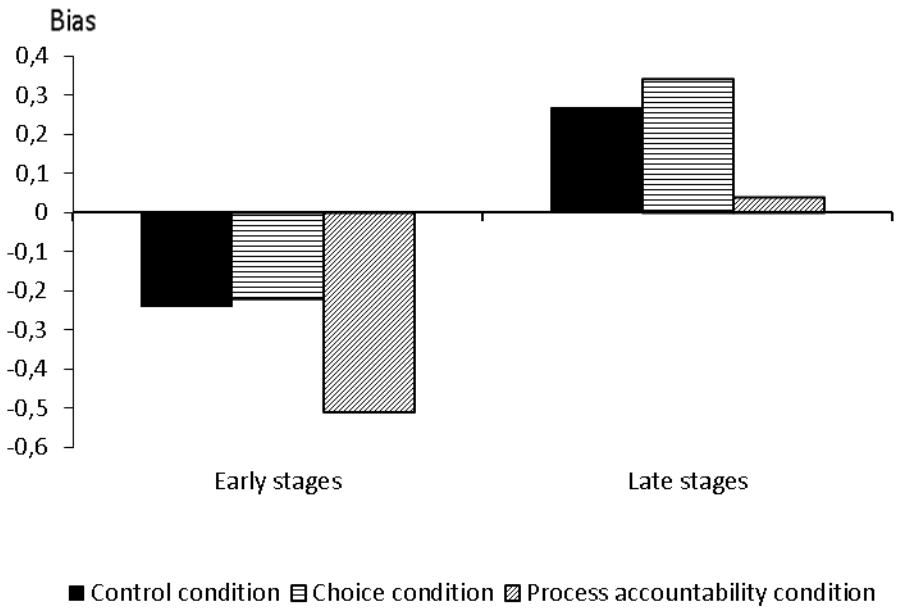

Figure 1. Information search bias in experimental conditions at early and late stages.