"Sunk costs and the need for justification: an experimental study on de-escalation"

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Abstract

In management decision-making is without doubt one of the most important aspects of the job. Thus, the effectiveness and quality of managerial decisions largely determine organizations' future success. Among the most important managerial decisions there are those relating to the allocation of scarce resources which we would expect to be based upon expectations about future performance. However, ongoing research in managerial decision-making suggests that under certain conditions managers are influenced by a phenomenon termed escalating commitment due to sunk costs. Since managers who are held accountable for an investment aim at justifying prior decisions, they tend to allocate further resources to the course of action despite negative feedback. While a large body of research in management science and economics has replicated this phenomenon in various contexts, activities and concepts to enforce de-escalation have received relatively little attention. This paper investigates the reasons for escalating commitment in a management context and exemplarily analyzes the contribution of information supply concerning consequences to enhance de-escalation. In an experimental study 390 managers were set into an escalation situation with a failing course of action for which they were held accountable. The authors manipulated the information concerning the amount and the kind of information on possible consequences of the decision. The results provide broad support for the occurrence of the sunk cost effect in the light of accountability and the need for justification. The study also reveals further key factors for escalating commitment and indicates that the information supply concerning consequences is not sufficient for de-escalation, but that it should be accompanied by other management practices and changes in norms and management culture.

Keywords: sunk costs, escalation of commitment, decision-making, need for justification.
JEL Classification: C12, C90, D81.

Introduction

Managers are constantly called upon to make decisions in order to allocate resources, solve problems, and achieve the objectives of an organization. By taking or failing to take actions managers in their role as decision-makers influence and guide people around them to enhance an organization's prosperity. Hence, the effectiveness and the quality of managerial decisions made each day throughout the organization determine both an organization's performance and how successful a manager will be (Yates, 2003). The functional and effective operation of managers and organizations is considered to be predominately produced by the presence of formal accountability systems and increased accountability in organizations (Hall, Blass, Ferris & Massengale, 2004; Lerner & Tetlock, 1999). Ongoing research in managerial decision-making suggests that many managers today indeed recognize their accountability and responsibility to make good decisions but also realize how biases can distort reasoning and rational decisions in business (Kahneman, Lovallo & Sibony, 2011). Since many of the decision situations that managers face involve turbulence, doubt, uncertainty, and large financial stakes there is a high potential for significant error and consequences of bad decisions that may be disastrous for an organization (Biyalogorsky, Boulding &

Staelin, 2006; Hall, 2010). Systematic errors and biases in managerial decision-making are often produced by numerous cognitive, informational, temporal, and other limitations that bound human rationality (Kahneman & Tversky, 1979; Simon, 1959). It is, for example, well documented that under certain conditions managers who are held accountable for a course of action, tend to remain committed to it even when prospects are bad and new information indicates that the action should be terminated. This irrational behavior termed escalation of commitment is manifested in a greater tendency to allocate further resources to a failing course of action despite negative feedback once resources such as money, time, and energy have been allocated in the past and even though these resources are irretrievable, thus, sunk costs (Arkes & Blumer, 1985; Hammond, Keeney & Raiffa, 2006; Parayre, 1995; Staw, 1981; Staw & Ross, 1987).

The most prominent explanatory theory that is thought to underlie this phenomenon is self-justification theory. According to self-justification theory (Staw, 1981) managers stick to a failing course of action because they aim at justifying prior choice to themselves (internal justification) and towards others (external justification). Although such a commitment may cause serious damage to an organization and although a recent McKinsey study showed that when organizations worked at reducing the effect of bias in their decision-making processes, their performance was significantly higher (Lovallo & Sibony, 2010), it comes somewhat as a surprise

that activities and concepts to enhance de-escalation have received relatively little attention in management research (Montealegre & Keil, 2000; Pan, Pan, Newman & Flynn, 2006) and practice. Explanations for this shortcoming might be two-fold. First, there is no clear evidence that the need for internal and external justification is the only reason for managers to escalate commitment. Second, there is no consensus that the need for justification unrestrictedly induces decision-making managers to escalate commitment. In fact, in contrast to self-justification theory, findings on the sunk cost effect reveal that decision-making managers who are held accountable and must justify their decision towards others tend less to escalate commitment (e.g. Brockner, Shaw & Rubin, 1979; Simonson & Nye, 1992; Simonson & Staw, 1992). These mixed results raise the question whether the need for justification and, more precisely, accountability are sufficient explanations for either escalation or de-escalation or whether managers probably have other reasons and motives for decisions in escalation situations. Furthermore, since decision-making managers who are held accountable have a stronger tendency to take into account any information regardless of its relevance (Hattrup & Ford, 1995; Tetlock & Boettger, 1994), we propose to force back escalating commitment due to sunk costs by providing managers specific information on the consequences of their decision.

We conducted a large-scale experimental survey using questionnaires and integrating almost 400 managers and 100 students. With the integration of a rather high number of managers, we enforce the external validity of results. Additionally, we expect further insights into the selected field of research from a more practical and application-oriented point of view. A primary contribution of our research is to raise awareness of the complexity of the issue in management practice and to achieve a fuller understanding of human decision-making. We want to shed further light on the sunk cost effect and to show where effective de-escalation strategies may start. On the basis of our findings we can derive valuable recommendations for management practice and future research.

On the basis of a literature review we designed a decisional situation which is likely to evoke escalating commitment. We set up a basic scenario and conducted two manipulations concerning the information on consequences. First, we suggested that de-escalation occurs when negative feedback gradually reduces decision-makers' confidence level and commitment to a course of action (Jermias, 2006; Montealegre & Keil, 2000; Schulz-Hardt, Vogelgesang, Pfeiffer, Mojziscj & Thurow-Kröning, 2010). Thus, we first manipulated information supply by

providing negative information related to the individual decision-maker accountable for the decision. Second, we proposed that decision-makers who are aware of the magnitude of the problem and the consequences of their decision are more likely to withdraw from a failing course of action (Garland, Sandefur & Rogers, 1990; Montealegre & Keil, 2000). Hence, we integrated another manipulation by providing additional company-related information. In what follows, we elaborate on the hypotheses.

1. Escalation situations, self-justification and accountability

Escalation situations involve (1) a series of behaviors linked into a course of action, (2) some feedback that the course of action is not achieving the original goal state, and (3) the opportunity to commit additional resources to achieving the original goal state. They are usually risky and impose severe time constraints on decision-makers (Brockner, 1992; Hammond et al., 2006; Parayre, 1995; Staw, 1981; Staw & Ross, 1987). According to classical economic and normative decision theory, decision-makers should assess the value and the probability of goal attainment due to additional resource allocation and choose the course of action with the greatest subjective expected utility. It would be rational to commit more resources into a course of action only if future prospects are favorable and if future costs are less than future benefits (Bowen, 1987; Brockner, 1992; Northcraft & Wolf, 1984; Staw & Ross, 1987). For several reasons, however, individuals do not always make rational choices (Parayre, 1995; Staw, 1981; Staw & Ross, 1978; Whyte, 1986). Indeed, we learn from descriptive decision theory that decision-makers allocate further resources to a failing course of action because they take previously allocated resources and their amortization into account although – according to normative decision theory – they are sunk costs and, thus, irretrievable or at least only at high costs (Brockner et al., 1986; Hammond, et al., 2006; Parayre, 1995; Staw, 1981; Staw & Ross, 1987). In contrast to behavioral models of subjective expected utility and prospective rationality, self-justification theory refers to the individuals' desire to rectify past outcomes, to proof their competence in previous as opposed to future actions and to appear rational in their decision-making (Staw, 1981; Whyte, 1986). Since individuals try to avoid an uncomfortable dissonance between present skepticism and past beliefs and actions, they do not want to admit to themselves that they have been wrong, but strive for internal justification of prior choice and retrospective rationality (Staw, 1976). Similarly, decision-makers who are held accountable for their decisions by salient others are unwilling to appear foolish and

to admit to others that their decisions were incorrect or to forego incentives (Hall, Bowen, Ferris, Royle & Fitzgibbons, 2007). Consequently, they tend to stick to a decision once made (Brockner, 1992; Jermias, 2006; Lerner & Tetlock, 1999; Staw, 1981; Whyte, 1986) and try to generate as many reasons as they can to externally justify past decisions even when future costs exceed future benefits (Jermias, 2006; Lerner & Tetlock, 1999). By contrast, however, research on the sunk cost effect reveals that decision-makers who are held accountable tend less to escalate commitment (e.g. Brockner et al., 1979; Lerner & Tetlock, 1999; Simonson & Nye, 1992; Simonson & Staw, 1992). To verify these findings and to create a basis for further analyses, our first hypothesis is formulated as follows.

H1: Decision-makers accountable for choosing a failing course of action tend less to escalate commitment.

2. Information and de-escalation

While there is quite a broad range of research on the phenomenon of escalating commitment in connection with sunk costs and the need for self-justification, there has been comparatively little research on de-escalation, that is on measures and actions to reduce commitment to a previously chosen but failing course of action (Montealegre & Keil, 2000; Pan et al., 2006). To the authors' best knowledge, there are a few studies on incentive systems, monitoring and control in this context (e.g. Fox & Staw, 1979; Harrison & Harrell, 1993; Keil & Robey, 1999; Kirby & Davis, 1998; Simonson & Staw, 1992), but there is only marginal discussion about possible contributions of information supply to de-escalation (e.g. Bowen, 1987; Keil & Robey, 1999; Northcraft & Wolf, 1984; Schmidt & Calantone, 2002; Whyte, 1986). The findings offered by the scarce research on de-escalation by means of information are diverging. On the one hand, studies suggest that the manipulation of information eliminates the tendency of subjects to escalate resource allocation (Conlon & McLean Parks, 1987) because more or better-structured information may broaden the view on the decision-problem and reduce uncertainty (Ghosh, 1997; Keil & Robey, 1999; Tan & Yates, 1995; Whyte, 1986). With regard to the problem of retrospective rationality it is likely that particularly prospective and highly diagnostic information is useful to ensuring rational decision-making (Garland et al., 1990; Staw & Ross, 1978). Thus, de-escalation might be enforced by making costs and resource expenditures more visible or salient (Keil & Robey, 1999) and by presenting future costs and benefits of the incremental investment (Ghosh, 1997; Tan & Yates, 1995; Whyte, 1986). On the other hand, studies reveal that

simply enriching or improving the information environment does not necessarily improve decisions (Boulding, Morgan & Staelin, 1997; Schmidt & Calantone, 2002). Since managerial work frequently means responding to unusual, ad hoc and unplanned situations (Hall, 2010), i.e. escalation situations, it may not be possible to unrestrictedly satisfy information needs in terms of quality, quantity, and timing. Furthermore, decision-makers who feel responsible for a losing course of action might selectively filter and distort information in the direction of their beliefs (Caldwell & O'Reilly, 1982), disregard contradicting information (Conlon & McLean Parks, 1987; Schwenk, 1986) or actively search for positive alternative-specific and confirming information (Huber, Huber & Baer, 2011; Schulz-Hardt et al., 2010). Prior research reveals this tendency even when the sources of information are credible (Schmidt & Calantone, 2002), when decision-makers are aware of facts such as closing costs and salvage value of an investment (Staw & Ross, 1987), when the visibility of costs is high and when alternative investments are explicitly presented (Keil & Robey, 1999). So there is a dilemma: The more extensive the information supply, the more evident are both the decision problem in the escalation situation and the possibilities for biasing information towards self-justification.

Appropriate proposals for solving this dilemma are rare. The suggestion to explain such a non-rational behavior and psychological mechanisms to decision-makers has not revealed any convincing results yet (Hammond et al., 2006; Staw & Ross, 1987). The integration of tests and disciplines into the decision-making process in order to uncover errors in thinking before they become errors in judgment has not revealed any promising results either (Hammond et al., 2006). However, since, there are findings in research that decision-makers likely escalate commitment as long as they are self-confident and find sufficient information to justify "bad", but individually rational decisions in the past, reducing the decision-makers' confidence level (Jermias, 2006) and clarifying the entire scope of the decision problem (Garland et al., 1990; Ghosh, 1997) might result in de-escalation. Consequently, primarily negative information on the decision problem and on consequences that severely affect the decision-makers might increase their awareness of the seriousness of the decision problem and simultaneously decrease their level of confidence in a chosen course of action. Thus, when clearly negative prospects do not corroborate the decision-makers' prior beliefs and choices, decision-makers assuming engage in more pre-emptive self-criticism and in more objective evalu-

ation of alternatives (Simonson & Staw, 1992). They also might recognize over-commitment and be more cautious and more open to consider alternative ways for future decisions (Jermias, 2006; Schulz-Hardt et al., 2010; Staw & Ross, 1987). Furthermore, explicit information on potential negative consequences might make recent failures seem minor in comparison to possible future failures, remove the sting of the past (Sivanathan, Molden, Galinsky & Ku, 2008) and confirm decision-makers that withdrawing from a losing course of action is the right decision. On the basis of these findings we deduce our second hypothesis.

H2: Among decision-makers accountable for choosing a failing course of action decision-makers receiving information on positive and negative personal consequences will exhibit less escalating commitment than decision-makers receiving information on positive personal consequences only.

Finally, since de-escalation will not occur until the gravity of the problem manifests itself unambiguously (Garland et al., 1990) and decision-makers in positions of responsibility and authority recognize the magnitude of the escalation situation (Montealegre & Keil, 2000), we extend the range of negative information by adding company-related reasons and consequences to the pool of information. Thus, our third hypothesis is formulated.

H3: Among decision-makers accountable for choosing a failing course of action decision-makers receiving information on negative personal and company-related consequences will exhibit less escalating commitment than decision-makers receiving information on negative personal consequences only.

3. Methodology and subjects

We conducted an experiment in two sessions with a total of 477 participants (389 professionals and 88 students). The overall participation rate amounted to 91.5% in the professional sample and to 97.7% in the student sample. The participants of the professional sample consisted of 82% male and 18% female participants. 80.7% were aged between 30 and 50. Since 63.4% of the professionals were managers, 14.2% entrepreneurs and 5.7% self-employed, the majority was in a leading position and disposed of discretionary authority. Participants worked mainly in industry (35.5%), information and consulting (19.5%), trade (17.5%), trades and crafts (12.3%). 30% of the companies counted less than 50 employees, another 30% between 50 and 250 employees and again 30% more than 500 employees. 95% of the companies were from Austria. The survey with the student sample was conducted in three advanced level courses of business administration at the Alpen-Adria-Universität Klagenfurt. Since all students had to fulfill entrance requirements to the courses, they had at least basic knowledge in management. Half of the students were male and female, respectively.

We designed a decision-situation in which we assigned the participants the role of a project manager in a long-term capital investment decision. Since capital investment decisions place large amounts of resources at risk for several years, are hardly reversible or at least only at high costs and determine further expenses already at a time when information on future trends is incomplete and uncertain, they are likely to provoke escalation situations (Hansen & Mowen, 1994; Horngren, Bhimani, Datar & Foster, 2005). Figure 1 shows such a course of action.
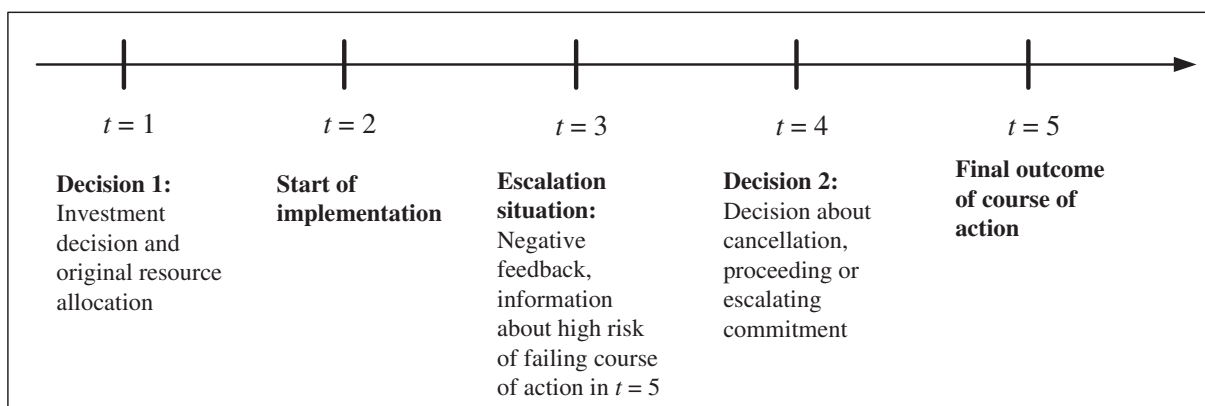

Fig. 1. Timeline of decisions including an escalation situation

In our survey the investment decision is about a new TV set that should be launched within the next 12 months. The initial decision was made two years ago ($t = 1$). Although the new TV set initially offered great prospects of success and induced high expectations concerning increasing turnover and market

shares, image and reputation, there is actually negative feedback about the chosen course of action, imperfect information, uncertainty, and time pressure ($t = 3$): At a multimedia fair one of the main competitors has just presented a new TV set that obviously offers higher performance at a lower price

as compared to the company's new TV set. The estimated probability that the competitor will launch the better and cheaper product first amounts to seventy percent and losses could amount to 10 million Euros for the company. Since (lots of) resources have already been allocated to the project and since the project has no value unless it is entirely completed, receiving negative feedback creates a dilemma for the decision-maker, in particular when he/she is held accountable. Since accountability may result from direct assignment or adoption of a role (Bobocel & Meyer, 1994; Caldwell & O'Reilly, 1982; Schoorman & Holahan, 1996), we explicitly suggested to the participants that they were held accountable for the investment project due to their function as project managers and that they were directly involved in previous decisions concerning the project. We also put clearly that they had already allocated a lot of energy, time, and patience to this project and fought against resistance in the organization during the last two years ($t = 2$). Finally, we informed the participants that, no matter what they decide, they will have to (1) justify losses towards the management, (2) bear severe criticism of their abilities as a project manager, (3) suffer damage to their personal reputation, and (4) lose trust among managers and colleagues (mainly deduced from Hall et al., 2007; Lerner & Tetlock, 1999) if the project fails or is not completed. From

these prospects about consequences we computed an average score to measure accountability.

In this situation ($t = 4$), participants had three options: (1) to cancel the project what means they forgo any investment made in the past, (2) to proceed with the project as it was planned although the total value of the project is likely to be negative, (3) to proceed under time pressure and allocate further resources. According to normative decision theory, any alternative other than cancellation would not be rational. As a consequence of the decision made in $t = 4$, certain final outcomes of the course of action will occur ($t = 5$). Corresponding to the hypotheses of our study, we provided selected information on personal and company-related consequences of the decision (see Figure 2). In scenario 1, participants knew that they would (1) share profits and receive a premium, and (2) experience significant enhancement of career opportunities if the project finally succeeded. In scenario 2, participants were additionally given the prospect that in the case of project failure there would be (1) no promotion but significant deterioration of career opportunities, and (2) deductions from premiums. In scenario 3 participants were additionally provided with the information that a project failure would cause (1) damage to the company image, (2) a reduction of the R&D-department, (3) dismissals, and (4) a loss of market share.
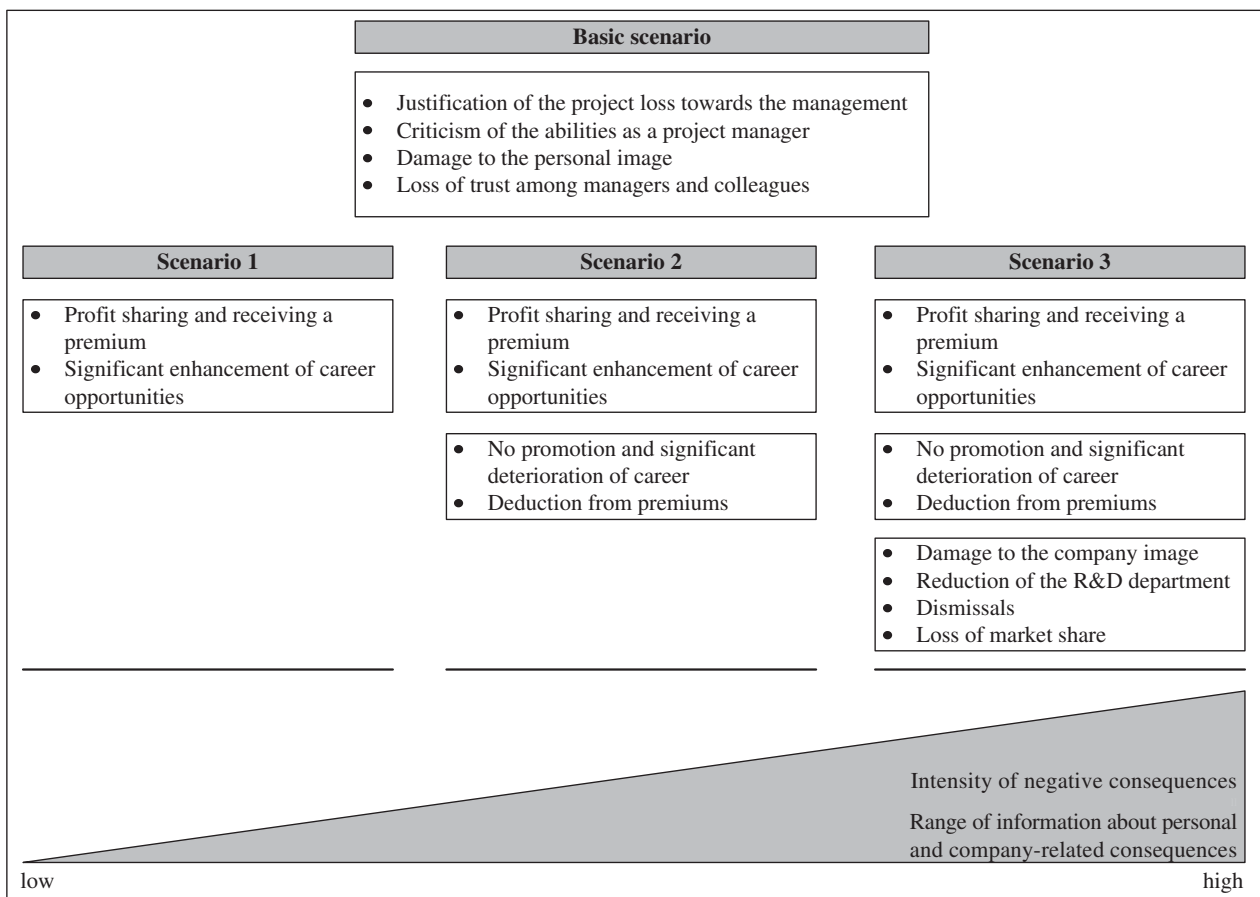

Fig. 2. Scenarios in the experimental task

4. Procedure and measures

In accordance with the three scenarios outlined above, participants were randomly assigned to a 1 x 3 factorial between subject design manipulating the information supply. Correspondingly, a questionnaire with three different modes regarding the information supply on consequences was employed. Data were collected in November 2009. The experiment with the student sample was conducted in three undergraduate seminars at the Department of Business Management of the Universität Klagenfurt. We kept the data on the students separate from those on the professionals for control purposes. The experiment with the professional sample was conducted in connection with a management conference on "Excellence in sports and management" organized by the School of Management, Organizational Development and Technology of the Universität Klagenfurt. The professional participants were seated in an auditorium and neither informed of the experiment's manipulative design nor warned against estimation bias. The presentation of the basic scenario was three-fold: (1) written on three power-point-slides, (2) read aloud by an experimenter, and (3) printed on the questionnaires which were randomly distributed to the participants. By doing so we expected to increase the participants' awareness of the fact that they are held accountable for their decision. The survey was completely anonymous. For the control session with the student sample we basically used the same three modes of the questionnaire but with fewer questions on demographic issues.

The dependent variable in our survey was the choice participants made in the escalation situation: (1) to cancel the project, (2) to continue the project as planned, or (3) to continue the project under time pressure and by allocating further resources. Multiple answers were not possible. The independent variable in our survey was the information supply that we manipulated by stepwise providing further information on consequences of the decision (three information levels). Since we also aimed at investigating the importance of accountability for escalating commitment compared to other reasons, we used a 5-point Likert scale to evaluate to what extent the participants' decision was influenced by this information about the prospect of specific consequences. Finally, in order to check for possible confounds, the dependence of escalation or de-escalation on factors such as age, gender, position in the company, industry, the size of the company, and the region was examined.

5. Results

5.1. Control variables and manipulation check.

There were no significant differences between the three groups concerning demographic issues such as age, gender, position in the company, industry, the size of the company, and the region of the work place. To check comprehensibility of the questionnaires, possible information overload and the effectiveness of the manipulation we derived confirmation from participants' perception of the relevance of specific information. Participants who failed to answer a considerable number of questions or gave inconsistent answers were excluded from our analysis. Furthermore, we conducted the second session with the student sample, calculated a score on the students' ability to remember information provided to them previously, and did a qualitative content analysis. Results show that students remembered key information, although their memory was not complete. However, by using an ANOVA we verified that only participants in scenario 3 tended to remember slightly less of the information ($F(2,83) = 3.233$, $p = .044$).

5.2. Hypothesis test. For the hypothesis test we predominantly conducted Chi-square tests. In our first hypothesis, we proposed that decision-makers accountable for choosing a failing course of action tend less to escalate commitment. Overall, regardless of the amount of accountability, almost 70% of the participants do not follow recommendations of normative decision theory and, thus, do not decide for cancelling the project. 50% of the participants even escalate commitment. As shown in Table 1 a Chi-square test does not reveal any differences between the scenarios.

Table 1. Participants' choice in the escalation situation

Scenario * Decision crosstabulation				
	Cancelling	Proceeding	Escalation	Total
Scenario 1	41 (43.7%)	21 (17.8%)	56 (47.5%)	118 (100%)
Scenario 2	42 (33.9%)	19 (15.3%)	63 (50.8%)	124 (100%)
Scenario 3	41 (36.0%)	13 (11.4%)	60 (52.6%)	114 (100%)
Total	124 (34.8%)	53 (14.9%)	179 (50.3%)	356 (100%)
Chi-square test				
		Value	df	Asymp. sig. (2-sided)
Pearson Chi-square		2.010	4	.734
Likelihood ratio		2.054	4	.726
Linear-by-linear association		.111	1	.739
N of valid cases		356		

Note: 0 cells (.0%) have expected count less than 5. The minimum expected count is 16.97.

Concerning the awareness of accountability, our analyses reveal that 52.5% of all participants feel accountable for their decision (52.5% in Scenario 1, 59.7% in Scenario 2, and 44.7% in Scenario 3). Across the whole sample, the loss of trust among managers and colleagues is the most convincing argument (72%). Furthermore, 68% perceive the prospect of severe criticism of their abilities as a project manager and of possible damage to their per-

sonal reputation to be relevant reasons for their decision, while only 56% say that the need for justifying possible losses towards the management has influenced their decision at least to some extent. A Chi-square test does not reveal any significant differences between the three scenarios concerning the awareness of accountability. Only participants assigned to scenario 3 perceive damages to the personal reputation as slightly less relevant than others. However, there are significant differences with regard to the impact of accountability on the decision (see Table 2).

Table 2. Chi-square test for hypothesis 1

Accountability * Decision crosstabulation				
	Cancelling	Proceeding	Escalation	Total
Not accountable	70 (56.5%)	30 (56.6%)	69 (38.5%)	169 (47.5%)
Acountable	54 (43.5%)	23 (43.4%)	110 (61.5%)	187 (52.5%)
Total	124 (100%)	53 (100%)	179 (100%)	356 (100%)
Chi-square test				
		Value	df	Asymp. sig. (2-sided)
Pearson Chi-square		11.499	2	.003
Likelihood ratio		11.562	2	.003
Linear-by-linear association		9.979	1	.002
N of valid cases		356		

Note: 0 cells (.0%) have expected count less than 5. The minimum expected count is 25.16.

According to a Chi-square test across the whole sample participants who show escalating commitment obviously feel a stronger pressure from being held accountable than others do. In all three scenarios, these participants are significantly more concerned about losing trust among managers and colleagues and about damages to the personal image. Furthermore, when escalating participants additionally know about negative personal and company-related consequences they are also heavily influenced by the prospect of justifying the project loss towards the management. Thus, we can assume that the impact of accountability on escalating commitment is more evident when there is more information. Overall, quite contrary to our first hypothesis accountability obviously increases the tendency to escalate commitment. Furthermore, our analyses indicate that the awareness of accountability, the importance of some prospects on consequences and also choice do not vary with regard to various demographic and business-related attributes of participants such as age, position, industrial and company background. There is only one exception: women feel significantly more accountable than men (64% of the female versus 49.5% of the male participants). Nonetheless, women are neither more nor less likely to escalate commitment.

In our second hypothesis, we proposed that among decision-makers accountable for choosing a failing course of action decision-makers receiving informa-

tion on positive and negative personal consequences exhibit less escalating commitment than decision-makers receiving information on positive personal consequences only. To test this hypothesis we compared data collected from the questionnaires of scenarios 1 and 2. Since there are no significant differences with regard to the decision taken by participants who feel accountable (see Table 3), our second hypothesis was not supported. However, this kind of information does not amplify escalating commitment either.

Table 3. Chi-square test for hypothesis 2 (accountable participants only)

Scenario * Decision crosstabulation				
	Cancelling	Proceeding	Escalation	Total
Scenario 1	17 (42.5%)	12 (60.0%)	33 (43.4%)	62 (45.6%)
Scenario 2	23 (57.5%)	8 (40.0%)	43 (56.6%)	74 (54.4%)
Total	40 (100%)	20 (100%)	76 (100%)	136 (100%)
Chi-square test				
		Value	df	Asymp. sig. (2-sided)
Pearson Chi-square		1.972	2	.373
Likelihood ratio		1.968	2	.374
Linear-by-linear association		.006	1	.936
N of valid cases		136		

Note: 0 cells (.0%) have expected count less than 5. The minimum expected count is 9.12.

In our third hypothesis, we proposed that among decision-makers accountable for choosing a failing course of action, decision-makers receiving information on negative personal and company-related consequences exhibit less escalating commitment than decision-makers receiving information on negative personal consequences only. To test this hypothesis we compared data collected from the questionnaires of scenarios 2 and 3. Since there are no significant differences with regard to the decision taken by participants who feel accountable (see Table 4), our third hypothesis was not supported. However, this kind of information does not amplify escalating commitment either.

Table 4. Chi-square test for hypothesis 3 (accountable participants only)

Scenario * Decision crosstabulation				
	Cancelling	Proceeding	Escalation	Total
Scenario 2	23 (62.2%)	8 (72.7%)	43 (55.8%)	74 (59.2%)
Scenario 3	14 (37.8%)	3 (27.3%)	34 (44.2%)	51 (40.8%)
Total	37 (100%)	11 (100%)	77 (100%)	125 (100%)
Chi-square test				
		Value	df	Asymp. sig. (2-sided)
Pearson Chi-square		1.327	2	.515
Likelihood ratio		1.368	2	.3505
Linear-by-linear association		.549	1	.458
N of valid cases		125		

Note: 0 cells (.0%) have expected count less than 5. The minimum expected count is 4.49.

Although we could not find any significant results concerning the impact of prospective information about consequences of the decision made by participants who are held accountable in escalation situations, we found some evidence that there are differences in reasoning.

5.3. Additional evaluations. For additional evaluations we predominantly conducted ANOVAs and *t*-tests. As Table 5 shows personal consequences are not equally relevant across the scenarios. Participants who have provided information on personal consequences only (scenarios 1 and 2) perceive profit sharing, receiving a premium and significant enhancement of career opportunities as more relevant than participants who have more information on consequences in total (scenario 3).

Table 5. Relevance of positive information on personal consequences (means, SD and ANOVA)

			Profit sharing and receiving a premium	Significant enhancement of career opportunities
Scenario 1		Mean (SD)	3.53 (1.14)	2.88 (1.30)
Scenario 2		Mean (SD)	3.48 (1.10)	2.78 (1.23)
Scenario 3		Mean (SD)	3.83 (1.06)	3.20 (1.18)
Across scenarios		F _p_-value	3.51 .031	3.55 .030
Scenario 1	Cancelling	Mean (SD)	4.05 (1.09)	3.88 (1.16)
	Proceeding	Mean (SD)	3.29 (0.90)	2.76 (1.09)
	Escalation	Mean (SD)	3.24 (1.14)	2.20 (0.99)
Within scenario 1		F _p_-value	7.24 .001	28.62 .000
Scenario 2	Cancelling	Mean (SD)	4.02 (0.92)	3.57 (1.06)
	Proceeding	Mean (SD)	3.06 (1.31)	2.26 (1.15)
	Escalation	Mean (SD)	3.23 (1.02)	2.41 (1.11)
Within scenario 2		F _p_-value	9.08 .000	16.64 .000
Scenario 3	Cancelling	Mean (SD)	4.32 (0.88)	3.88 (0.97)
	Proceeding	Mean (SD)	3.38 (1.12)	2.75 (1.14)
	Escalation	Mean (SD)	3.60 (1.05)	2.83 (1.14)
Within scenario 3		F _p_-value	7.78 .001	12.33 .000
	Cancelling	Mean (SD)	4.13 (0.97)	3.77 (1.07)
	Proceeding	Mean (SD)	3.23 (1.10)	2.58 (1.13)
	Escalation	Mean (SD)	3.36 (1.08)	2.49 (1.11)
Across choice		F _p_-value	23.93 .000	53.00 .000

Note: 1 = strongly agree, 5 = strongly disagree; SD = standard deviation.

When interpreting these results, two arguments must presumably be considered. First, participants in scenario 3 have more information and, thus, they probably pay shared attention to specific information. Second, the importance of some information on personal consequences may be forced out by further negative information. Not taking into account that participants in the various scenarios dispose of different levels of information, it can be said that profit sharing and receiving a premium as well as the enhancement of career opportunities is significantly less relevant for those who cancel the project. In contrast, those who proceed with the project perceive premiums and career opportunities as more important, although there is no significant difference between those who continue with the project as planned and those who show escalating commitment ($t(226) = -0.746$, $p = .456$, $d = .170$ for profit sharing and $t(227) = 0.519$, $p = .604$, $d = .175$

for career opportunities). Similar results were found for all three scenarios.

Similar to the impact of information concerning positive consequences on choice, the prospect of losing promotions and of suffering from deterioration of career opportunities is obviously more relevant for those who proceed with the project and particularly for those who escalate commitment than for those who cancel the project (see Table 6). This effect is weakly significant when there is information on personal consequences only (scenario 2), but highly significant in the face of company-related consequences (scenario 3). In contrast, deductions from premiums are equally relevant for the participants no matter what they decide but significantly loose relevance in the light of information on company-related consequences (scenario 3).

Table 6. Relevance of negative information on personal consequences (means, SD and t-test/ANOVA)

			No promotion, deterioration of career opportunities	Deduction from premiums
Scenario 2		Mean (SD)	3.34 (1.24)	3.56 (1.12)
Scenario 3		Mean (SD)	3.54 (1.21)	3.86 (0.94)
Across scenarios (t-test)		*t* *p*-value *d*	-1.256 *.210* .160	-2.170 *.031* .136
Scenario 2	Cancelling	Mean (SD)	3.69 (1.18)	3.61 (1.22)
	Proceeding	Mean (SD)	3.35 (1.27)	3.47 (1.28)
	Escalation	Mean (SD)	3.10 (1.22)	3.56 (1.01)
Within scenario 2 (ANOVA)		F *p*-value	2.99 *.054*	0.09 *.911*
Scenario 3	Cancelling	Mean (SD)	4.05 (1.04)	4.12 (0.94)
	Proceeding	Mean (SD)	3.54 (1.05)	3.85 (0.99)
	Escalation	Mean (SD)	3.20 (1.25)	3.68 (0.91)
Within scenario 3 (ANOVA)		F *p*-value	6.50 *.002*	2.70 *.071*
	Cancelling	Mean (SD)	3.87 (1.12)	3.86 (1.12)
	Proceeding	Mean (SD)	3.43 (1.17)	3.63 (1.16)
	Escalation	Mean (SD)	3.15 (1.23)	3.62 (0.96)
Across choice (ANOVA)		F *p*-value	0.01 *.000*	1.42 *.244*

Note: 1 = strongly agree, 5 = strongly disagree; SD = standard deviation.

A fundamental insight from the results of our study is that there is presumably some company-related information in scenario 3 that is perceived as more relevant than personal monetary or non-monetary damage. The decreasing relevance of personal consequences in the face of company-related consequences is corroborated by two further findings. First, a comparison of the means for scenario 3 presented in Table 5 and Table 6 with those in Table 7 indicates that company-related consequences are more important for the decision than personal consequences. Both participants who cancel the project and who escalate commitment regard information on company-related consequences as considerably more relevant than information on personal consequences. However, concerning personal consequences, negative and positive information seem to be equally relevant for the decision. This is true regardless of the information level, thus in all three scenarios.

Table 7. Relevance of negative information on company-related consequences in scenario 3 (means, SD and ANOVA)

		Damage to the company image	Reduction of the R&D department	Dismissals	Loss of market share
Cancelling	Mean (SD)	1.80 (1.19)	2.66 (1.39)	2.71 (1.40)	2.18 (1.24)
Proceeding	Mean (SD)	3.00 (1.29)	3.46 (1.39)	3.46 (1.27)	2.73 (1.42)
Escalation	Mean (SD)	1.80 (1.03)	2.33 (1.21)	2.48 (1.27)	2.12 (1.03)
Across choice	F *p*-value	6.60 *.002*	4.18 *.018*	2.96 *.056*	1.33 *.269*

Note: 1 = strongly agree, 5 = strongly disagree; SD = standard deviation.

Second, a Principal Component Analysis supports differences in prioritization of relevant information. When participants have access to information on personal as well as company-related consequences, two factors can be extracted. As the column on the right in Table 8 shows there is one factor including information on personal consequences (Cronbach's alpha = 0.849) and one factor including information on company-related information (Cronbach's alpha = 0.786).

Table 8. Principal Component Analysis in scenarios 1, 2 and 3

Varimax Rotated Component Matrix	Scenario 1		Scenario 2		Scenario 3 (personal consequences only)		Scenario 3 (all consequences)	
Component	1	2	1	2	1	2	1	2
Justification of project loss	.621	.156	.696	.059	.667	.160	.575	.273
Criticism of the abilities	.852	.156	.879	.075	.767	.288	.721	.273

Table 8 (cont.). Principal Component Analysis in scenarios 1, 2 and 3

	Scenario 1		Scenario 2		Scenario 3 (personal consequences only)		Scenario 3 (all consequences)	
Component	1	2	1	2	1	2	1	2
Damage to the personal reputation	.861	.183	.858	.092	.840	.309	.782	.325
Loss of trust	.838	.163	.871	.086	.836	.186	.648	.495
Profit sharing, receiving a premium	.140	.894	-.074	.799	.091	.897	.713	-.193
Enhancement of career opportunities	.230	.853	-.033	.817	.427	.783	.880	-.115
No promotion, deterioration of career opportunities			.280	.720	.564	.560	.797	.025
Deduction from premiums			.167	.636	.290	.771	.735	.029
Damage to the company image							-.020	.766
Reduction of the R&D department							.073	.762
Dismissals							.214	.741
Loss of market share							-.002	.750
Extraction method: Principal Component Analysis. Rotation method: Varimax with Kaiser normalization								
Kaiser-Meyer-Olkin and Bartlett's test								
KMO measure	.719		.685		.847		.833	
Approx. Chi-square	258.797		356.844		437.283		562.499	
df	15		28		28		66	
Sig.	.000		.000		.000		.000	

When the Principal Component Analysis is limited to information on personal consequences, again two factors are revealed in all three scenarios. On the one hand, monetary, economic consequences including profit sharing, career opportunities and premiums, and on the other non-monetary, more social consequences including reputation, trust, and prestige. As mentioned previously, monetary, economic consequences are perceived as less relevant than non-monetary, more social consequences throughout all three scenarios. In particular, those who cancel the project attach much more relevance to the latter consequences than to monetary consequences. Decision-makers who escalate commitment perceive monetary and non-monetary, more social consequences as equally relevant for their decision when there are positive personal consequences only (scenario 1). When there are also negative personal consequences, the relevance of non-monetary, more social consequences decreases (scenarios 2 and 3).

Discussion and conclusion

In this paper we focused on one of the most important aspects of a manager's job – that is decision-making. Since an organization's success is tied directly to the quality and effectiveness of the decisions made each day throughout the organization, we pay our attention to prior research findings that under certain conditions managers do not make good and rational decisions but fall into so-called hidden traps in decision-making. In particular, we investigate the phenomenon of escalating commitment due to sunk costs against the backdrop of accountability. Despite the fact that this phenomenon is one of the most persistent problems in manageri-

al decision-making and, thus, has been addressed and replicated already in several studies before, activities and concepts to force back escalating commitment have received relatively little attention in management research and practice. One reason for this kind of shortcoming may be that escalating commitment was predominately explained by the need for self-justification while other key factors for managerial decisions in escalation situations were rather ignored. Consequently, the contribution of our research is two-fold. First, from a research perspective we contribute to the development of a comprehensive theory of escalating commitment by examining limitations of the phenomenon. Second, from a more practical point of view we contribute by deriving behavioral predictions and providing prescriptive advice for management practice. For this purpose, the present study identifies further key-factors relevant to decision-making in escalation situations which in turn may indicate where effective de-escalation strategies in managerial decision-making may start.

Our results provide some clarification on the interrelationship between sunk costs, the need for justification in a failing course of action, and information concerning consequences of the decision. Since our main sample consisted of almost 400 managers of whom one third has even experienced similar escalation situations before, we assume the generalizability of our results. Our study basically confirms prior research findings that decision-making managers predominately do not act as predicted by normative decision theory but stick to a course of action that is disadvantageous for either the individual or

the company or both (e.g. Parayre, 1995; Staw, 1981; Staw & Ross, 1978; Whyte, 1986). Apart from this finding our study reveals, against our predictions and prior findings (e.g. Brockner, et al., 1979; Simonson & Nye, 1992; Simonson & Staw, 1992), that managers who escalate behavior obviously feel a stronger pressure from being held accountable. By contrast, our study weakly corroborates research showing that accountability amplifies escalating commitment (Boulding et al., 1997; Bowen, 1987; Brockner et al., 1986; Sivanathan et al., 2008). In this context, we cannot exclude that the need for justification would have had an even stronger impact if the managers had also made the initial choice for the respective course of action themselves (Wolff & Moser, 2008). On this aspect further research is definitely needed.

Against our hypotheses, information concerning negative consequences of the decision apparently does not ensure that managers make rational choices. With these findings we corroborate prior research results in two respects. First, simply enriching or improving managers' information environment does obviously not enhance the mitigation of escalating commitment (Boulding et al., 1997; Schmidt & Calantone, 2002). Second, information on negative consequences does obviously not result in enlightenment and clarification of the escalation situation. By contrast, managers more likely perceive it as a threat and, as we know from prior studies, threats more likely enforce escalating commitment than de-escalation (Keil & Robey, 1999; Simonson & Staw, 1992). However, since information on consequences related to the individual or the company or both do not increase escalating commitment either, our results slightly oppose prior findings that reveal an amplification of escalating commitment when managers have more information that they may use for justifying past decisions (Jermias, 2006). Nonetheless, our results support the assumption that managers do not take into account the total amount of information but selectively filter information in the direction of their beliefs (Caldwell & O'Reilly, 1982; Conlon & McLean Parks, 1987; Schwenk, 1986).

Besides managers' selective perception we found some evidence that the combination of positive and negative information, on the one hand, and the combination of personal and company-related information, on the other, seem to be somewhat important in an escalation situation. While positive information on consequences becomes more relevant for continuation in the face of negative information, managers seem to attach less relevance to positive consequences when they cancel the project. Thus, they presumably still try to selectively focus on informa-

tion that corroborates a chosen or preferred course of action for which they are held accountable. These findings are in line with prior studies (e.g. Caldwell & O'Reilly, 1982; Conlon & McLean Parks, 1987; Schwenk, 1986) and may indicate that it could be better not to provide decision-making managers any information on positive consequences at all; in particular also because information on positive consequences seems to be more relevant for continuation and escalation than for cancellation. Managers who continue a course of action obviously attach more importance to any kind of information they are provided. Consequently, we may support common knowledge in management practice that limited but appropriate information supply is recommended.

Finally, we got a rather unexpected insight about the perception of personal versus company-related consequences. When there are consequences that concern the company as a whole consequences linked to the decision-making manager as a person lose relevance. Thus, managers apparently tend to attach more importance to the overall welfare and to the benefits of the company than to their personal wealth. They, indeed, feel a need for justification but are not sufficiently selfish to unrestrictedly put their personal gain above that of the company. These findings may enhance critical discussions about the classic model of man underlying managerial and business economics, that is homo economicus (Kirchgässner, 2000), and about prominent theories such as new institutional economics and agency theory. They rather correspond to a new or "modern" model of man influenced by sociology and psychology that regards managers as collective-serving actors who do not exclusively seek personal wealth, status, leisure, and the like. Rather there exist multiple values and multiple choice processes involving one or more choice dimensions (Donaldson, 1990; Hosseini & Brenner, 1992). Similarly, non-monetary, more social consequences are obviously more relevant reasons for the managers of our sample than monetary losses or gains. Hence, in contrast to economic theory, managers are not exclusively interested in their own material payoff and in monetary data. Further, they do not pursue monetary objectives only (Agle et al., 2008; Barney, 1990; Davis, Schoorman & Donaldson, 1997; Fehr & Schmidt, 1999). In fact, monetary consequences become even less important the more information on social consequences is provided. Apparently, managerial decision-makers have some kind of social concerns, although none of these factors significantly changes the decision.

From a management perspective our findings are, indeed, somewhat disillusioning as they indicate that the potential to attenuate escalating commit-

ment within accountable decision-makers is apparently limited. However, the absence of corroborating results may also be explained by some limitations of our study. First, the negative information on personal as well as company-related consequences might not have been the "right" information or it was probably not strong enough. There may be other representations that enfold higher impact on managerial decision-making behavior. Furthermore, the representation of the negative consequences was probably not eye-catching and impressive enough to induce a significant impact on decision-making behavior. Second, there might be an impact of the need for justification on decision-making behavior, but the effect is quite small. That means decision-makers accountable for their decisions might show a lower or higher level of escalating commitment due to the representation of negative consequences but the magnitude of both increases and decreases is only low. Third, we did not check for the decision-makers' general level of commitment. If managers are highly committed to an organization as such, they may behave in a different way, e.g. pay greater attention to the consequences for the entire organization and be more concerned about meeting the organization's objectives and contributing to corporate well-being.

Despite these possible explanations, we still have to take into consideration that information supply on consequences is probably not the appropriate or most effective practice to force back escalating commitment in managerial decision-making. It might be that the more managers who are held accountable for their decisions think about arguments that forewarn them about why a chosen course of action might fail, the more entrapped they become in it and the more they tend to allocate further resources to it (see also e.g. Schulz-Hardt et al., 2010). If this assumption is true, the limitation of escalating commitment more likely requires other practices such as incentive schemes or monitoring or also changes in norms, ethical standards, and management and organizational culture. Evidence from the present study, i.e. concerning the relevance of various factors for decision-making in escalation situations, may be useful for corresponding initiatives in management practice.

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