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BSFA Working Paper Series

Why management accountants are punished for reporting bad news: Understanding the cognitive processes

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Working Paper No. 11 / January 2019

BSFA I Behavioral and Social Finance & Accounting
A research section at the Giessen Graduate Centre for Social Sciences, Business, Economics and Law

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Why management accountants are punished for reporting bad news:

Understanding the cognitive processes

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Abstract

Reporting is a key activity of management accountants. Usually, managers make decisions and later receive a report about the favorable or unfavorable results of their decision. In this context, we investigate how reporting (un)favorable news to managers affects how these managers evaluate the reporting skills of the management accountant preparing the report. Using a laboratory experiment, we predict and find that the favorability of the reported news biases managers' subjective performance evaluation (SPE) of the management accountant. This bias is magnified when managers' compensation depends on the reported results. Furthermore, we analyze the cognitive processes that cause the distorted evaluation and find that the bias is context-dependent; that is, managers' evaluation of reporting-related skills is biased, but their assessment of reporting-unrelated skills is not. The results and implications for theory and practice are discussed. In particular, we highlight that there are many similar situations in firms – beyond the manager-management accountant relationship – in which a decision-maker evaluates another employee who communicates the results of that decision to the decision-makers. Our study shows that the subjective performance evaluations provided by these decision-makers might be biased.

Keywords: reporting, subjective performance evaluation, management accounting

JEL: M410

We thank Marcel van Rinsum, Matthew Sooy (discussant), the attendees at the 2018 European Accounting Association Annual Congress, the attendees at the 2018 American Accounting Association Annual Meeting and the participants of the 2017 Experimental Research in Management Accounting (EXRIMA) Summer School of the University of Bochum for their helpful comments and suggestions. We appreciate the financial support provided by The Chartered Institute of Management Accountants (CIMA).

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Abstract

Reporting is a key activity of management accountants. Usually, managers make decisions and later receive a report about the favorable or unfavorable results of their decision. In this context, we investigate how reporting (un)favorable news to managers affects how these managers evaluate the reporting skills of the management accountant preparing the report. Using a laboratory experiment, we predict and find that the favorability of the reported news biases managers' subjective performance evaluation (SPE) of the management accountant. This bias is magnified when managers' compensation depends on the reported results. Furthermore, we analyze the cognitive processes that cause the distorted evaluation and find that the bias is context-dependent; that is, managers' evaluation of reporting-related skills is biased, but their assessment of reporting-unrelated skills is not. The results and implications for theory and practice are discussed. In particular, we highlight that there are many similar situations in firms – beyond the manager-management accountant relationship – in which a decision-maker evaluates another employee who communicates the results of that decision to the decision-makers. Our study shows that the subjective performance evaluations provided by these decision-makers might be biased.

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1. Introduction

Management accounting serves two goals: facilitating decisions, e.g., via reporting, and influencing decisions (Demski and Feltham 1976). With respect to the decision-facilitating role, managers depend on receiving accurate, concise and understandable reports informing them of the favorable or unfavorable results of their decisions (Byrne and Pierce 2007). Research in this field focuses mainly on how managers use reported information (Hall 2010). From the perspective of the management accountant, however, the use of a report is not the only factor that matters. Because reporting is one of management accountants' key activities, it is also a crucial career dimension in which management accountants should excel (Sorensen 2007).

When evaluating the performance of a management accountant, e.g., in 360-degree feedback (Edwards and Ewen 1996), the manager's evaluation of the management accountant is important. This is particularly true for project teams that consist of a single manager and a single management accountant. However, even when there is no formal evaluation process, the management accountant's career will, at least to some extent, depend on her perception by other members of the organization, including management. Prior research shows that in fact, managers form opinions about management accountants (Pierce and O'Dea 2003) and as the interaction between managers and management accountants grows, managers' perceptions of management accountants become more important (Goretzki et al. 2013).

Evaluating the performance of management accountants, e.g., in reporting, however, remains largely subjective, as there is a lack of appropriate objective performance measures. Subjectivity makes the evaluation process prone to biases of managers who are also recipients of the reports about the favorable or unfavorable results of their decisions. Prior research provides various examples of managers' self-serving behavior that potentially affects the evaluation of management accountants. For example, Barton and Mercer (2005) show that managers tend to

blame poor firm performance on external factors, while success is viewed as a consequence of personal decisions and actions (Bettman and Weitz 1983). Similar behavior unfolds when managers blame subordinates for poor performance (Martinko et al. 2007). Whether a manager's self-serving behavior when receiving favorable or unfavorable reports distorts the performance evaluation of management accountants remains an open question.

Because reporting not only is a key activity of management accountants but also ultimately affects decision-making and firm success, answering this research question is important. On the one hand, biased evaluations might harm job satisfaction and, thus, effort and performance (Colquitt et al. 2013). On the other hand, blaming others for a poor decision affects firm value because, due to bias, managers will take insufficient corrective actions. Furthermore, if management accountants anticipate biased performance evaluations, they might even withhold negative information in their reports to avoid negative performance evaluations.

We focus on a situation in which the news reported by a management accountant to a manager is uninformative about the management accountant's performance, that is, a situation in which the management is not involved in a project other than reporting the project's success. More precisely, we examine whether the evaluation of a management accountant in this situation is biased in the direction of the reported results of a management decision. We also investigate whether managers' compensation (fixed versus performance-contingent) moderates this potential bias, and we shed light on the cognitive processes.

Our first hypothesis predicts that managers evaluate management accountants' reporting skills less positively if the management accountant reports unfavorable rather than favorable news about a management decision. Based on cognitive dissonance theory (Festinger 1957), we argue that because managers expect (and naturally prefer) a favorable outcome and if this expectation is not fulfilled (is fulfilled), cognitive dissonance (consonance) evolves. This emotional state of

cognitive dissonance causes a distortion of the assessment of management accountants' reporting skills. We argue that this situation holds even though the management accountant is not involved in the decision-making process. Our second hypothesis predicts that the distortion magnifies if the reported results affect managers' compensation because the consequences of the reported results become more important (Cooper and Fazio 1984; Harmon-Jones 1999). Finally, we posit a research question to explore whether cognitive dissonance affects only reporting-related skills or also reporting-unrelated skills.

To test our hypotheses and answer our research question, we conduct a laboratory experiment with 122 business students as participants. We employ a 2 × 2 full factorial between-subjects design in which we manipulate the favorability of the reported outcome of a management decision (favorable/unfavorable) and the manager's compensation (fixed/performance-contingent). Participants act as managers and complete two tasks. First, participants decide to invest in one of two projects. In the next period, a management accountant who is not otherwise involved in the decision-making process reports the project's success. Participants' second task is to provide subjective performance evaluations. After reading the report, managers evaluate the management accountant's reporting skills and the design quality of the report, both of which are held constant across conditions. Next, to test our research question, participants receive additional information about the management accountant and evaluate other skills that are partly reporting-related and partly reporting-unrelated.

In line with our first hypothesis, we find lower (higher) subjective performance evaluations of the management accountant's reporting skills when the reported results are negative (positive). As predicted, participants distort their evaluations in the direction of the project's result. We find that the assessment of the report's design quality mediates this effect. As predicted by our second hypothesis, subjective performance evaluations are more biased when the project's results affect

the manager's compensation. Finally, with respect to the research question, our results suggest that the evaluation of reporting-related skills is biased, but the assessment of reporting-unrelated skills is not.

Our study contributes to management accounting theory and practice. From a practical perspective, we show that managers' evaluation of a core responsibility of management accountants – that is, reporting – is biased by the favorability of the reported news. Hence, firms must be aware of this distortion, and where possible, they should have, e.g., a superior with the least involvement in the reported results evaluate the reporting skills of management accountants. Because biases in performance evaluations might negatively affect employee performance, awareness of such biases and the subsequent implementation of adequate strategies can increase firm value (Bol 2011). Our results also indicate that when managers' compensation depends on the results reported by management accountants, their evaluations are more heavily biased. This is the case, for example, when management accountants calculate the EVA® or other measures of management performance that are also used for compensation purposes (Indjejikian and Nanda 2002).

Notably, our findings not only have implications for the relationship between managers and management accountants. Situations where decision-makers evaluate others who are not otherwise involved in the decision than reporting the decision's outcome are ubiquitous in the business world. For example, think of a bank that provides its clients with annual information about the value of clients' (self-managed) portfolios or the subordinate updating her superior about the success of one of the superior's decisions. Frequently, the reporter is (formally or informally) evaluated by the decision-maker – as is the bank that asks its customers to answer a customer satisfaction survey or the subordinate in the annual performance appraisal by the superior.

With respect to theory, our study contributes in at least four ways. First, we add to the stream of research that identifies sources of biases in subjective performance evaluation. Prior research in this field emphasizes, for example, the rater's cognitions or emotions, exertion of influence by the ratee, the rater-ratee relationship, or situational factors, such as the appraisal's purpose (Levy and Williams 2004). However, research that specifically investigates the evaluation of employees who report decision outcomes is scarce. To the best of our knowledge, this is the first study to explore the appraisal of management accountants and identify the favorability of news reported as a source of bias.

Second, prior research documents a spillover effect of an agent's (unrelated) objective performance on the agent's subjective evaluation (Bol and Smith 2011). In this case, objective and subjective measures relate to the same person. Instead, we focus on situations where the objective performance of a third person – that is, the manager – spills over onto the subjective evaluation of the management accountant. Furthermore, we also show an important caveat to spillover effects. More precisely, when differentiating between reporting-related and reporting-unrelated work dimensions, we find that the bias is resolved because the dimension evaluated is not related to the report.

Third, Martinko et al. (2007, p. 578) state that "research that measures the degree of biases between leaders and member and then demonstrates the consequences of these biases in terms of leader-member conflict and relations would be helpful". We address this call for research by identifying managers' compensation as an important moderator.

Our fourth contribution to theory lies in the structural equation model presented. We use this model to clearly identify the cognitive processes that result in a biased performance evaluation. Understanding these processes is crucial to drawing conclusions in terms of handling bias, i.e., recommending adequate debiasing strategies. More precisely, if the bias is purely caused by

emotions, implementing a cool-down phase before evaluations are conducted seems sufficient. If, however, the underlying process is more complex and the distortion of evaluations arises from a manager's self-serving behavior and the choice of the dissonance reduction strategy and its effect on the self-image and emotional state, firms should implement different debiasing strategies. We discuss potential strategies in our conclusion.

The remainder of this paper proceeds as follows. Section II discusses the hypothesis development. Section III outlines our experimental method, while Section IV presents and debates our results. Section V concludes the paper.

2. Development of hypotheses

Managerial decision outcome (H1)

Our first hypothesis predicts that managers' subjective performance evaluation of management accountants' reporting skills is biased by the favorability of the information that management accountants report. Because economic theory suggests that unrelated information should not affect subjective performance evaluation, we employ psychological theory to substantiate the effect predicted by H1.

Managers' decisions are usually the result of intensive thought processes. Therefore, the results of such decisions are (noisy) signals of managers' skills. As managers strive for a positive self-image (Festinger 1954), they prefer favorable feedback about the decision results. Management accountants provide reports that inform managers about the outcome of their decisions. While the result of the decision reflects managers' performance, the preparation and design of the report reflect the performance of management accountants.[1]

[1] In a real-world situation, management accountants are also usually involved in the decision-making process, for example, by providing data or applying management accounting concepts. However, for a clean test of our theory, we assume that the management accountant reports only the outcome of the managerial decision.

Among different investment alternatives, a manager will choose the alternative that she expects to lead to the most favorable outcome. If, however, a negative development of the investment alternative is reported, a mismatch arises between the manager's positive expectation and the negative information conveyed by the report, resulting in cognitive dissonance.

Cognitive dissonance, as introduced by Festinger (1957), is a negative affective state or discomfort that arises from a misfit between two related sets of information (Elliot and Devine 1994). Irreversibility and personal responsibility are necessary prerequisites for cognitive dissonance to materialize (Cooper and Fazio 1984). Responsibility requires perceived freedom in making a decision and the foreseeability of potential consequences of this decision. Resulting from the presence of personal responsibility, individuals potentially experience aversive (unwanted) consequences from the results of their decision. Aversive consequences, which we discuss in more detail when developing hypothesis 2, are potential or real threats to an individual, such as a self-image threat (Cooper and Fazio 1984).

Individuals who perceive cognitive dissonance strive to reduce that dissonance to reach a cognitively consistent state (Birnberg et al. 2007), which can be achieved by three different strategies, whereby the choice of a strategy to overcome a negative affective state of cognitive dissonance depends primarily on the strategy's impact on the individual's self-image. The first alternative to reduce the dissonance is for individuals to alter their prior set of information (i.e., the expected outcome of the selected alternative). However, admitting a poor decision will negatively affect the manager's self-image. An individual can, as a second strategy, seek new information that confirms the expectation, or, third, reinterpret the second set of information (i.e., the report conveying information on the actual outcome). If acquiring further information is not possible, the

Nonetheless, our theory and findings can also be generalized to situations where management accountants are involved in the decision-making process.

manager will reduce the dissonance by reinterpreting the report and, thus, the management accountant's skills. More precisely, the manager cognitively devalues the source of cognitive dissonance, i.e., the report. This mechanism protects the manager's perception of one's own skill level and, therefore, self-image and emotional state (Pyszczynski et al. 1993).

We argue that individuals also attribute their evaluation of the report to the management accountant who prepared the report because individuals try to find causes of negative and positive outcomes. Moreover, Bond et al. (2007) identify subjective interpretations and preliminary opinions about information as a source of information distortion. Furthermore, individuals fail to evaluate unrelated pieces of information independently, which implies that the initial information – that is, the report about the outcome of the manager's decision – affects the interpretation of the management accountant's performance. However, individuals are also emotionally involved (Harvey et al. 2014), and to a certain extent, individuals know about their emotions, and they might even know that their evaluations are biased (Andrade and Ariely 2009). Thus, they may be partly aware that their evaluations are biased. Overall, we follow Birnberg et al. (1977, p. 190), who argue that such misattributions are "semi conscious" processes.

The same mechanism applies to favorable outcomes. Analogously, as individuals strive for an improvement of their self-image, managers attribute a favorable outcome to their personal skills rather than, e.g., luck (Kelley 1973; Zuckerman 1979). This misattribution also affects the manager's evaluation of the management accountant. Consequently, we posit hypothesis 1 as follows:

HYPOTHESIS 1. *A manager's subjective evaluation of a management accountant's reporting skills is lower (higher) if the report conveys unfavorable (favorable) information about a decision made by that manager.*

Moderating effect of management compensation (H2)

Our second hypothesis focuses on whether and how bias is aggravated when the reported decision outcome affects the manager's compensation. In the case of an unfavorable outcome, in the first step, cognitive dissonance theory suggests a larger magnitude of cognitive dissonance to occur. With respect to the aversive consequences of a negative decision outcome, such as self-image threats and monetary losses of the manager (Cooper and Fazio 1984), some argue that aversive consequences are a prerequisite for cognitive dissonance to occur (Cooper and Fazio 1984), while others disagree (e.g., Harmon-Jones et al. 1996). However, it remains undisputed that more severe aversive consequences aggravate cognitive dissonance. This finding is also supported by Festinger (1957), who states that the magnitude of dissonance is a function of the cognition's importance. Thus, aversive consequences are greater when the manager's compensation depends on the results reported than when the manager receives a fixed compensation. This situation magnifies the perceived cognitive dissonance.

However, in a subsequent step, compensation also affects the strategy of dissonance reduction. As discussed in H1, an individual can try to reduce cognitive dissonance by (1) admitting a suboptimal decision, (2) seeking additional information, or (3) reinterpreting the dissonant set of information (Birnberg et al. 2007). H1 states that individuals tend to reinterpret the new information to avoid negative self-image effects. However, an individual might interpret a direct effect of the negative outcome on her compensation as an implicit recrimination. This serves as a signal for dissatisfaction about the individual's decision-making, thus making it more likely that she attributes the unfavorable outcome to her personal skills (Martinko et al. 2007). Accordingly, individuals are more likely to change their opinion about the decision they made in the first place. As a result, in terms of a negative outcome, individuals reduce the heightened dissonance by

admitting unfavorable decisions more often. This situation partly mitigates the effect of enlarged aversive consequences on the evaluation.

When a report conveys positive results, no aversive consequences arise, irrespective of the manager's compensation. Rather, a bonus payment positively affects the manager's wealth. Bol (2011) argues that personal incentives have an impact on a manager's performance appraisals in favor of the manager's personal preferences. Thus, the manager is also more likely to attribute the outcome to her personal skill level (Martinko et al. 2007). The attribution of the positive results to the personal skill level also leads to an improvement of the manager's self-image and, in turn, her emotional state. Furthermore, in addition to the improved self-image caused by the attribution of the favorable outcome to their skills, the performance-contingent payment honors the manager's decision-making. A positive emotional state results in more lenient evaluations (Lefkowitz 2000; Sinclair 1988). Individuals do not try to reduce this emotional state, unlike the cognitive dissonance that arouses negative emotions. Consequently, the effects of a favorable outcome on the evaluation bias are unidirectional.

In summary, the effects an unfavorable result are weakened by the preferences for dissonance reduction strategies, whereas the impact of a favorable report on subjective performance evaluations (SPE) towards the management accountant is strictly positive. These combined effects suggest an effect of the compensation scheme on the strength of evaluation biases. Consequently, we posit Hypothesis 2 as follows:

HYPOTHESIS 2. *A manager's subjective evaluation of a management accountant's reporting skills is more biased when the manager's compensation depends on the reported decision outcome than when his/her compensation is fixed.*

Outreach of distorted performance evaluations (RQ)

While H1 predicts a biased evaluation of reporting-related skills, it does not address the outreach of this distortion, that is, whether the manager's assessment of reporting-unrelated skills, such as social skills, is also biased. We address this issue using a research question.

Cognitive dissonance arouses negative affect (Festinger 1957). Because affect influences judgment, it impacts the manager's evaluation process (Forgas 1995). If one's emotional state drives distortion, any subjective evaluation by that manager is affected, irrespective of whether it is potentially linked to the source of the distortion, that is, the report (Sinclair 1988). If emotions are the key driver of biased evaluations, the emotional state of the manager mediates the effect of the favorability of the reported news on the manager's subjective evaluation.

In contrast, if the urge to reduce the dissonance caused by the report serves as a mediator, bias has only a content-related outreach. Bond et al. (2007, p. 240) state that the bias of information distortion "can be explained by the operation of coherence-directed processing". This statement suggests that a certain degree of coherence is required between the evaluated capabilities and the information causing the distortion, i.e., the reported decision outcome. Thus, the measure of dissonance reduction used to overcome this negative emotional state must relate to the source of dissonance arousal to be successful. This relationship would imply that only such evaluations that relate to the report are distorted. Because of these two alternative mechanisms, we posit a research question on whether reporting-unrelated skills, such as social skills, suffer from biased evaluations.

RESEARCH QUESTION. *Does a manager also distort the evaluation of a management accountant's reporting-unrelated skills?*

3. Experimental method

Experimental manipulations

To test our hypotheses and answer the research question, we conduct a laboratory computer-based experiment employing a 2 × 2 full factorial between-subjects design. Participants act as managers who make an investment decision and are then informed about the outcome of their decision by a management accountant. We manipulate the *favorability of the news reported* by the management accountant at two levels (*unfavorable*/*favorable)* and the *manager's compensation* at two levels (*fixed*/*performance-contingent)*. The experiment was programmed and conducted using z-Tree (Fischbacher 2007). Figure 1 presents an overview of the experimental manipulations and procedure applied:

[Insert Figure 1 about here]

Participants, acting as managers, receive information about two projects and must choose one in which to invest. After making this decision, participants receive a report informing them about the project's outcome: that is, whether it is favorable or unfavorable. The favorability of the news reported is manipulated using a random mechanism. That is, in line with the scenarios provided to participants when making their decisions, each project has a probability of 50% (50%) to lead to a favorable (unfavorable) outcome. Participants in the favorable condition receive a report with a positive project result, whereas participants in the unfavorable condition receive a report with a negative outcome.

Participants' compensation is manipulated at two levels, i.e., compensation is either fixed or performance-contingent. In the fixed treatment, participants receive a flat-wage payment of 12

€ for participating.[2] In the performance-contingent compensation treatment, participants receive 8 € if the project results in a loss (unfavorable condition) and 16 € if it is profitable (favorable condition).

Experimental task

The experiment consists of two tasks: making an investment decision and conducting a subjective performance evaluation of the management accountant. As our theory for cognitive dissonance builds on personal responsibility for a decision, participants make the investment decision themselves before performing the subjective performance evaluation.

Participants in the experiment act as managers of the fictitious sports company ELICS. They receive information about the company and two potential investment projects, "ELICS Running Guide" and "ELICS Pulse". Both projects are related to innovative athletic shoes[3] and require a one-year license to start the project. Hence, the time horizon for the decision is one year. Participants are provided with quantitative information (sales volume, price, and costs) and qualitative information (product description, target groups, and customer interviews) about both projects. Participants are informed that all project information is gathered by the marketing department – not the management accountant – to avoid any involvement of the management accountant in the decision-making process.[4]

For each project, three scenarios are presented in the experimental materials, with selling prices and costs being identical in all three scenarios of a project and sales volumes differing by scenario. Appendix A contains the experimental materials for one project, including the

[2] At the time the experiment was conducted, 1 euro equaled $1.12.

[3] We randomized the order in which the two projects were presented to avoid primacy effects.

[4] While gathering the project information might also be a management accounting task, we separated this task from the management accounting role to strengthen the internal validity of the experiment.

descriptions of the three scenarios. Participants who use the quantitative information for their decision should realize that for both projects, the probabilities of realizing a profit or a loss are both 50%. However, the expected value for one of the two projects, i.e., "ELICS Running Guide", is slightly greater. Depending on how participants interpret and weight the qualitative information, however, they might have reason to prefer the other project. For the experimental design, it is important that participants identify with their decision, but it is not important which project they select. After they make their investment decision, we ask the participants if they expect their project to result in a profit.

Whether the project chosen leads to a favorable or unfavorable outcome is determined by a random mechanism. Participants are informed by a report provided by the management accountant about the project result, that is, the favorability of the decision outcome.[5] Notably, the report depicts one of the three scenarios provided beforehand. Moreover, the reports differ only by sales volume. Hence, total costs, cost structure, and the structure of revenues are identical in all conditions. Furthermore, the reports do not differ in the design, the arrangement of text and graphics, or color.

After reading the report, participants conduct the second task, that is, the subjective performance evaluation. Before providing their answers, participants are reminded that the management accountant Michael Schwartz prepared the report and was not otherwise involved in the decision process. This evaluation task consists of two parts.

In the first part, participants assess the management accountant's reporting skills ("Reporting skills") and the graphical report quality ("Report design") on a scale ranging from 0 (very bad) to 100 (very good).[6] Our main dependent variable for testing our hypotheses is managers' subjective evaluation of the "reporting skills of the management accountant". To

5 The negative and positive reports for "Running Guide" are presented in Appendixes B and C, respectively.

6 All questions and statements used for the evaluations are presented in Appendix D.

measure "Reporting skills", we use participants' answers to the following question: "Please rate Mr. Schwartz' performance with respect to the development of the report on a scale from 0 (very bad) to 100 (very good)."

As outlined in the hypothesis development section, we argue that the effect of the favorability of the news reported on the subjective evaluation of the management accountant's reporting skills is mediated by how participants evaluate the report's quality. To measure the perceived "Report design", participants answer the following question: "Please rate the graphic representation of the report on a scale from 0 (very bad) to 100 (very good)." We ask about the quality of the graphical representation of the report because it is objectively constant across conditions. If we had asked, e.g., for the completeness of the report, participants in the unfavorable condition might have had more reason to perceive the report as incomplete because, in a loss scenario, more information is required to analyze the reasons for this loss.

In the second part of the evaluation task, participants receive further information about the management accountant's working experience, tasks, manners and behavior, followed by comments of co-workers.[7] Then, participants are asked to conduct further evaluations. While some of the statements in this second part again focus on "Reporting-related skills" (e.g., Michael Schwartz is able to present information in an understandable and well-structured way; Schwartz has a good understanding of economic coherence), others relate to "Reporting-unrelated skills" (i.e., teamwork skills and personality).[8] This second part of the evaluation task is used to answer our research question, that is, whether reporting-unrelated skills also suffer from biased

[7] The information provided to subjects is modeled after —but not identical to— the materials provided to participants in Bol and Smith (2011). We gratefully acknowledge these authors for sharing their experimental materials with us.

[8] The second task, the performance evaluation, was structured in two parts because our research question explores whether the evaluation of the management accountant's reporting-unrelated skills is also distorted. Hence, we provided further information about the management accountant that also addressed reporting-unrelated skills. We then asked not only for reporting-unrelated but also for reporting-related skills to rule out the possibility that our findings for reporting-unrelated skills are simply the effect of timing and oblivion.

evaluations. However, we also include questions concerning reporting-related skills. Potential differences in the evaluation for reporting-unrelated and reporting-related skills can therefore not arise due to the time lag between the manipulation, i.e., the report, and the second part of the evaluation.

Procedures

Upon their arrival at the laboratory, participants had 10 minutes to read the written instructions. Participants were informed that they would act as managers of the sports company ELICS, received information about their compensation and were instructed about how to operate the software. Subsequently, participants were asked to read a short description of ELICS. To ensure their understanding of the key information and the experimental procedure, participants took a quiz before continuing with the main task.

The next step was to complete the investment task described in the previous section. Participants were allotted 20 minutes to read information about two potential investment projects, "ELICS Running Guide" and "ELICS Pulse". Calculators were available at every workplace if, e.g., participants wanted to compute expected values. After 20 minutes, participants had to decide which project they wanted to buy a license for, that is, which of the two they wanted to realize.

Participants then received the report, and before submitting their subjective performance evaluations, they were reminded that the management accountant only provided the report and was not otherwise involved in the decision-making process. As explained before, the subjective performance evaluation was divided into two parts. While some questions were asked directly after reading the report, other questions – reporting-related evaluations and reporting-unrelated evaluations – were asked after participants received a more detailed description of the management accountant providing the report.

Finally, participants completed a set of questions from the post-experimental questionnaire, answered manipulation check questions, and were informed about their compensation. Before participants were dismissed, they received their compensation. The experiment lasted approximately one hour.

Participants

A total of 122 business students from a large West European university participated in the experiment. We randomly assigned participants to the treatments *fixed* and *performance-contingent* compensation. A random mechanism determined whether participants received a favorable or unfavorable report about the project's success. This process resulted in four treatments, i.e., unfavorable/fixed, unfavorable/performance-contingent, favorable/fixed and favorable/performance-contingent. Eight participants were excluded from our analysis (resulting in a sample of 114 subjects) because they did not pass the manipulation check; that is, they did not recall whether their project resulted in a profit or loss or they indicated that the management accountant was involved in the project decision. However, if not stated otherwise, our main results are inferentially identical when using the full sample.

The participants' average age was 25 years, and 68 participants (60%) were male. There were no significant differences across conditions for age ($p = 0.76$, two-tailed, Kruskal-Wallis test) or gender ($p = 0.327$, two-tailed, chi-square test). Hence, we conclude that the randomization was successful.

4. Results

Descriptive statistics

Table 1 shows the mean and the standard deviation for the main variables of the two parts of the subjective performance evaluation, that is, before and after participants received a more detailed description of the management accountant. Evaluation questions were answered on a scale ranging from 0 (very bad) to 100 (very good). Our main dependent variable for our tests of H1 and H2 is managers' subjective evaluation of the management accountant's *reporting skills*. To answer our research question, we asked three additional questions that assess *reporting-related skills* and two that address *reporting-unrelated skills*. As depicted in Table 1, we use factor analysis to aggregate these questions into a single factor for reporting-related and reporting-unrelated skills.[9]

The descriptive results for reporting skills are in line with our hypotheses. We find that the managers' subjective evaluation of the management accountant's reporting skills is lower (64.77) in the unfavorable condition than in the favorable conditions (75.24) and that the difference between favorable and unfavorable is greater under the performance-contingent compensation scheme (11.5 = 77.50 - 66.00) than under the fixed compensation scheme (9.28 = 72.70 – 63.42).

We find similar results using the standardized factor for reporting-related skills. The appraisal of reporting-related skills is lower (-0.23) in the unfavorable condition than in the favorable condition (0.31). Furthermore, the decrease from favorable to unfavorable news is greater in the performance-contingent condition (from 0.36 to -0.30) than under the fixed condition (from 0.25 to -0.16). Interestingly, this pattern is not reflected by the factor that measures reporting-

[9] As a conservative approach, analogous to, e.g., Lowe et al. (2002), we applied explorative factor analysis, where the dependent variables – reporting-related skills and reporting-unrelated skills – were obtained through principal component analysis (PCA). The PCA reveals that two extracted factors, with an eigenvalue of 1.06, explain 71 percent of the variance. Further, we assigned the five factors by rotated factor loadings greater than 0.5 through Varimax rotation. Finally, a regression results in a standardized factor score that has a mean of 0 and a variance of 1. Hence, a negative score indicates appraisals under the average, and a positive score indicates appraisals over the average for the management accountant.

unrelated skills. First, when managers receive performance-contingent compensation, their assessment of reporting-unrelated skills is almost the same in the unfavorable (0.14) and favorable (0.18) conditions. Second, the decrease in the evaluation of reporting-unrelated skills when moving from favorable to unfavorable news is not magnified when performance-contingent compensation is provided (-0.04), but it is magnified when fixed compensation is provided (-0.18).

[Insert Table 1 about here]

Hypothesis test

H1 predicts that the favorability of news reported affects the manager's evaluation of the management accountant's reporting skills. In detail, a manager's subjective performance evaluation of a management accountant's reporting skills is lower (higher) if the report conveys unfavorable (favorable) information about a decision made by that manager. As discussed above, the descriptive results are in line with our prediction.

As stated within the development of H1, cognitive dissonance occurs if two relevant but contradictory sets of information exist, i.e., an expectation and a deviating outcome. Thus, before testing our hypothesis, we verify that in fact, participants have a positive expectation when making the investment decision. Using a 7-point Likert scale, we find that participants have a positive expectation concerning the decision results (5.71) that is significantly different from the scale's midpoint 4 ($T = 16.80$, $p < 0.01$, two-tailed). Hence, the requirement for cognitive dissonance to occur is fulfilled.

H1 is formally tested using analysis of variance (ANOVA) with manager's evaluation of the management accountant's reporting skills as the dependent variable. The results are displayed in Table 2. As predicted by H1, the effect of favorability on reporting skills is significant ($F = 6.79$,

p = 0.01, one-tailed). Thus, managers' subjective evaluation of a management accountant's reporting skills is lower when the management accountant reports unfavorable news. H1 is supported.

[Insert Table 2 about here]

H2 posits that managers' bias when evaluating a management accountant's reporting skills is greater if management compensation is performance-contingent rather than fixed. In line with H2, the descriptive results show that a manager's evaluation of the accountant's reporting skills decreases more in response to unfavorable news when the manager receives performance-contingent pay (-14.84%) compared with fixed pay (-12.76%).

To test for the interaction effect predicted by H2, we do not rely on the ANOVA results reported in Table 2 because ANOVA is less powerful in identifying ordinal interactions (Buckless and Ravenscroft 1990). Instead, we use planned contrasts. We employ the following contrast weights: -2 for unfavorable/performance-contingent, -2 for unfavorable/fixed, +1 for favorable/fixed and + 3 for favorable/performance-contingent. Table 3 presents the test results with the evaluation of a management accountant's reporting skills as the dependent variable. The results support H2 (F = 7.63, p < 0.01, one-tailed).[10] Thus, we conclude that the predicted interaction effect exists and that performance-contingent compensation reinforces the biased perception of management accountants' reporting skills.

[Insert Table 3 about here]

[10] Our results for H2 are robust to the use of alternative contrast weights -3, -1, +1 and +3 (F = 6.30, p < 0.01, one-tailed) or -2, -3, +1 and +4 (F = 7.73, p < 0.01, one-tailed).

Finally, we address the research question of whether managers also distort the evaluation of reporting-unrelated skills. We use data from the second part of the evaluation process, which includes questions reflecting reporting-related and reporting-unrelated skills. The descriptive data for the factor scores (and the questions) for reporting-related or reporting-unrelated skills that are used to answer the research question are displayed in Table 1.

First, to rule out that our findings for reporting-unrelated skills are driven by timing effects and oblivion, we replicate our findings for H1 and H2 using the factor score for reporting-related skills. The results are presented in Table 4, panels A (H1-replication) and C (H2-replication). Our results for H1 ($F = 8.46$, $p < 0.01$, one-tailed) and H2 ($F = 8.48$, $p < 0.01$, one-tailed) are inferentially identical to those of our tests above.[11] With respect to the second factor, however, we find that favorability does not affect reporting-unrelated skills ($F = 0.34$, p-value = 0.56, two-tailed), as presented in Table 4, panel B. Furthermore, using the same contrasts as before, we find no significant interaction effect for reporting-unrelated skills using the ANOVA results ($F = 0.13$, $p = 0.72$, two-tailed) or the contrast analysis ($F = 0.75$, $p = 0.39$, two-tailed).[12] Accordingly, we conclude that the extent of managers' cognitive distortion is context-dependent, which is limited to reporting-related skills. This finding underlines that a biased evaluation is not due to a general effect of managers' affective state, which is either positive (favorable news) or negative (unfavorable news).

[Insert Table 4 about here]

[11] Our results for the replication of H2 for reporting-related skills are robust to the use of alternative contrast weights -3, -1, +1 and +3 ($F = 8.80$, $p < 0.01$, one-tailed) or -2, -3, +1 and +4 ($F = 7.70$, $p < 0.01$, one-tailed).

[12] Our results for the replication of H2 for reporting-unrelated skills stay inferentially identical to the use of alternative contrast weights -3, -1, +1 and +3 ($F = 0.14$, $p = 0.71$, two-tailed) or -2, -3, +1 and +4 ($F = 1.17$, $p = 0.28$, two-tailed).

Additional analysis

In this subsection, we first validate our theory by identifying the cognitive patterns suggested by cognitive dissonance theory. We then elaborate on the role of emotions in biased performance appraisal. Finally, we use a structural equation model (SEM)[13] to investigate the underlying cognitive processes that drive the distorted evaluations in more detail.

First, according to cognitive dissonance theory, a cognitive dissonance materializes if the outcome conveyed by the report does not match the manager's expectation. Therefore, we measured cognitive dissonance by asking participants about the outcome relative to their expectation on a scale from 1 (far below my expectations) to 7 (far above my expectations). As expected, participants report the unfavorable (favorable) outcome to be below (above) their expectations. The difference (2.37 vs. 4.24) is statistically significant ($F = 226.59$, $p < 0.01$, two-tailed). We refer to this variable as "Cognitive dissonance" in the SEM that we present at the end of this section.

According to our theory for H1, one strategy for participants to reduce cognitive dissonance is to challenge the decision they made. Using a 7-point Likert scale, we find that —in hindsight— participants evaluate their decision more often to be appropriate if the outcome was favorable (5.90) compared to an unfavorable outcome (4.38), with the difference being statistically significant ($F = 19.38$, $p < 0.01$, two-tailed). We refer to this variable as "Reevaluation of the decision" in our SEM.

As seeking additional information that is in line with the expectation is not possible, we predict that – for self-serving reasons – participants reinterpret the report. In order to protect or

[13] For our tests, we employ AMOS software and compute path coefficients based on maximum likelihood estimation.

improve their self-image, we argue that participants attribute a favorable outcome to themselves, while attributing an unfavorable outcome to external factors, i.e., the report and the management accountant. Therefore, we asked participants whether they believed that the project's outcome is informative about their individual business skills. In line with our theory, we find a significant effect of favorability ($F = 16.40$, $p < 0.01$, two-tailed). Thus, participants in the favorable treatment (4.41) attributed the positive outcome to their personal skills more often than participants in the unfavorable treatment (3.14). As we refer to the misattribution of the decision outcome to the report's objective design features as a semi-conscious process, we ask participants on a 7-point Likert scale from 1 (adjusted downwards) to 7 (adjusted upwards) if they consciously adjusted their evaluation of the report or the management accountant, respectively. We aggregated these answers to a factor that we refer to as "Misattribution" in our SEM. Interestingly, while most participants state that they did not consciously distort their evaluations (92 of 114), we find that, overall, a favorable (unfavorable) outcome leads to a conscious over- (under-) evaluation ($F = 8.93$, $p < 0.01$, two-tailed). However, even when dismissing participants who stated that they consciously adjusted both of their evaluations ($n = 92$), we still find a significant effect of the favorability of the reported news on the evaluation of the management accountant ($F = 4.22$, $p = 0.04$, two-tailed).

As self-image and emotional state are intertwined, the dissonance reduction strategy chosen should also affect participants' emotional state. In order to derive debiasing strategies, it is crucial to understand the underlying processes of the distorted evaluation. More precisely, if the biased evaluations are caused purely by emotions, a cool-down phase before evaluations are conducted could be an efficient debiasing technique. However, the bias might also arise primarily from the manager's self-serving behavior, the choice of the dissonance reduction strategy, and its effect on the self-image and emotional state. In this case, firms would need to implement other debiasing strategies, which we briefly discuss in the conclusion section.

To measure participants' emotional state, we employ the Positive and Negative Affect Schedule (PANAS) (Watson et al. 1988). We refer to this variable in our SEM as the "Emotional state". Finally, our SEM contains the variables "report design" and "reporting skills". Report design is participants' evaluation of the design of the provided report on a scale from 1 to 100, while reporting skills is our main dependent variable and, thus, the evaluation of the management accountant's reporting skills. The SEM is presented in Figure 2.

[Insert Figure 2 about here]

Overall, the model is a good fit for the data.[14] First, the SEM shows that a distorted evaluation of the management accountant is caused by cognitive dissonance. Second, we find no direct effects through the emotional state. Third, we identify the change in the opinion about the report as an important mediator, substantiating our reasoning regarding the results of our research question.

First, investigating indirect effects, we find support for our theory of cognitive dissonance. We find a significant indirect effect through Link 2 × Link 5 × Link 6 × Link 9 ($p < 0.01$). Thus, a less favorable outcome elicits cognitive dissonance that is semi-consciously misattributed to the report. This misattribution eventually distorts the appraisal of the management accountant's reporting skills. Moreover, the indirect affect through Link 2 × Link 3 × Link 4× Link 8 × Link 9 ($p = 0.01$) suggests that individuals partly reduce their dissonance by admitting a poor decision in the first place. However, this strategy also affects the appraisal of the management accountants'

[14] This finding is supported by a chi-square test, with $X^2 = 9.87$ and $p = 0.452$ resulting in a X^2/DF of 0.987. Thus, the RMSEA is 0. Lastly, the Tucker-Lewis index (TLI) and the incremental fit index (IFI) both have the value of 1.00, which is over the acceptable level of 0.90 (Kline (2015)).

reporting skills, as it elicits unfavorable emotions that are directed towards the report. Because the direct effect of favorability (Link 11) remains marginally significant, we infer partial mediation.

Second, our model suggests that the devaluation of the report is not driven purely by emotions. Unlike the indirect effects through cognitive dissonance, we find no significant indirect effects purely through the emotional state either directly via Link 1 × Link 10 ($p = 0.37$) or mediated by the evaluation of the report design (Link 1 × Link 8 × Link 9; $p = 0.21$). Consequently, we conclude that emotions play a role because they are closely connected to the self-image, but they are not the only driver of our results.

Third, we find that the effects of the emotional state, as well as of misattribution to the report, are fully mediated by the distortion of the evaluation of the report. More precisely, while the direct effect of the emotional state on the appraisal of the management accountant's reporting skills (Link 10) is insignificant ($p = 0.58$), we find a significant indirect effect mediated by the evaluation of the report design (Link 8 × Link 9; $p = 0.02$). Analogously, the outcome is not directly misattributed to the reporting skills (Link 7; $p = 0.64$). Rather, this effect is also mediated by the appraisal of the report design (Link 6 × Link 9; $p < 0.01$). Thus, for our research question, we conclude that the perception of the report is an important mediator within the cognitive process. Therefore, only reporting-related skills of the management accountant are distorted by the manager.

5. Conclusion

In almost all firms, management accountants (or others) inform managers about the results of their decisions via reports. Furthermore, managers' evaluation of management accountants' skills matter for the management accountants' career, long-term compensation, or task allocation. Because reporting is a core task of management accountants, we investigate whether and to what extent the favorability of the news reported about a management decision affects the performance evaluation

of the management accountant. Additionally, we investigate whether managers' performance-contingent compensation magnifies the evaluation bias.

To test our predictions, we conduct a laboratory experiment in which participants act as managers. First, participants make an investment decision, and a report informs them about the outcome of the decision. Second, participants evaluate the reporting and other skills of the management accountant preparing the report. Importantly, the management accountant is not otherwise involved in the decision process.

In line with our theory, we find that if the report contains favorable rather than unfavorable news about the manager's decision, the manager's evaluation of the management accountant's reporting skills is more positive. Additionally, we find that the distortion is magnified if managers receive performance-contingent compensation that depends on the decision outcome rather than fixed compensation.

We attribute our findings to cognitive dissonance theory, cognitive distortion and aversive consequences. More precisely, if a manager makes a decision and expects a positive outcome but receives unfavorable information, cognitive dissonance materializes. To protect her self-image, the manager devaluates unfavorable information rather than admitting a bad decision. This action is mirrored in the negative evaluation of the management accountant's reporting skills. Furthermore, we find that distortion emerges only for evaluations that relate to the object that elicits the cognitive dissonance, that is, the report. More precisely, the distortion affects the evaluation of reporting-related skills but not the evaluation of reporting-unrelated skills. Additionally, by means of our SEM, we confirm cognitive dissonance as the main source of the biased evaluations. Therefore, we can also show that emotions play an important role but are not the key driver for the identified bias. Rather, due to cognitive dissonance, managers misattribute the favorability of the outcome of their decision to their perception of the quality of the report that conveyed this information.

Although the management accountant is entirely independent of this outcome, we find that the bias spills over to the performance evaluation of the messenger, i.e., the management accountant. Therefore, we identify the report as the source of the misattribution and as an important mediator. Our analysis also suggests that this misattribution can best be described as a semi-conscious process. The identification of the underlying processes is important for the choice of sufficient debiasing strategies.

Our study has important implications for management accountants and managers. Because reporting is a key activity of management accountants, many studies investigate how managers use information provided by management accountants. However, little is known about how managers subjectively evaluate management accountants' performance on this task. From a theory perspective, such research is important because prior studies in the field of subjective performance evaluation show that such appraisals are distorted by other factors, such as emotions, liking, or similarity between the rater and the rate (Levy and Williams 2004). From a practical perspective, our findings help firms to improve their performance evaluation process by making them aware of this "reporting bias". This step is important because distorted performance appraisals usually have negative consequences. On the one hand, a management accountant might face negative consequences, e.g., in terms of career opportunities. On the other hand, distorted evaluations are at risk of being perceived as unfair (Cohen-Charash and Spector 2001; Greenberg 1986) and, hence, of negatively affecting motivation, effort and job satisfaction (Colquitt et al. 2013). Therefore, distorted evaluations might harm long-term firm performance. On the contrary, if management accountants anticipate potentially unfavorable performance evaluations caused by the reporting of unfavorable news, they might hesitate to prepare such a report and, e.g., adjust operating numbers. In turn, this further deteriorates the quality of management decisions and lowers long-term performance.

Moreover, our results are not limited solely to the relationship between the manager and the management accountant. Rather, the risk of distorted evaluations is present in all organizational situations in which an independent employee has to report an unfavorable decision outcome to his superior, as subordinates usually conduct the task of analyzing and reporting project results.

Potential measures to mitigate distortion include double-checking the evaluation of management accountants or using an alternative approach, such as a third person, to assess report quality and the management accountant's reporting skills. Firms might also employ other debiasing strategies, such as requiring the manager to justify the appraisal, in order to reduce bias (Mero et al. 2003). Furthermore, because we identify cognitive dissonance as the process driving the misattribution of the project's outcome to the report and the management accountant, reducing the development of dissonance seems reasonable. Therefore, the working environment might be an important moderator. For example, in an environment where mistakes and, thus, unfavorable results are also seen as an opportunity to learn for the future (Edmondson 1999), managers are less incentivized to blame others for their failure.

Future research might further investigate such techniques and environmental factors. This research could also examine whether the bias is mitigated if the decision for a failed project is a joint decision rather than one made by one manager. Further, it is worthwhile to investigate whether the bias is greater for managers in large companies that are the focus of the media because the potential self-image threat appears greater in these situations. Additionally, as personal consequences, i.e., compensation, affect biases, future research might investigate whether personal consequences moderate the effectiveness of established debiasing strategies. For example, requiring a justification for a performance appraisal might be more or less effective if the stakes are extremely high. Finally, as employees might anticipate unfavorable performance appraisals for

reporting bad news, future research could empirically investigate the effect of distorted evaluations on employees' reporting behavior and the backfire effects on managers' decision quality.

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Figure 1 Depiction of the experimental manipulations and procedure

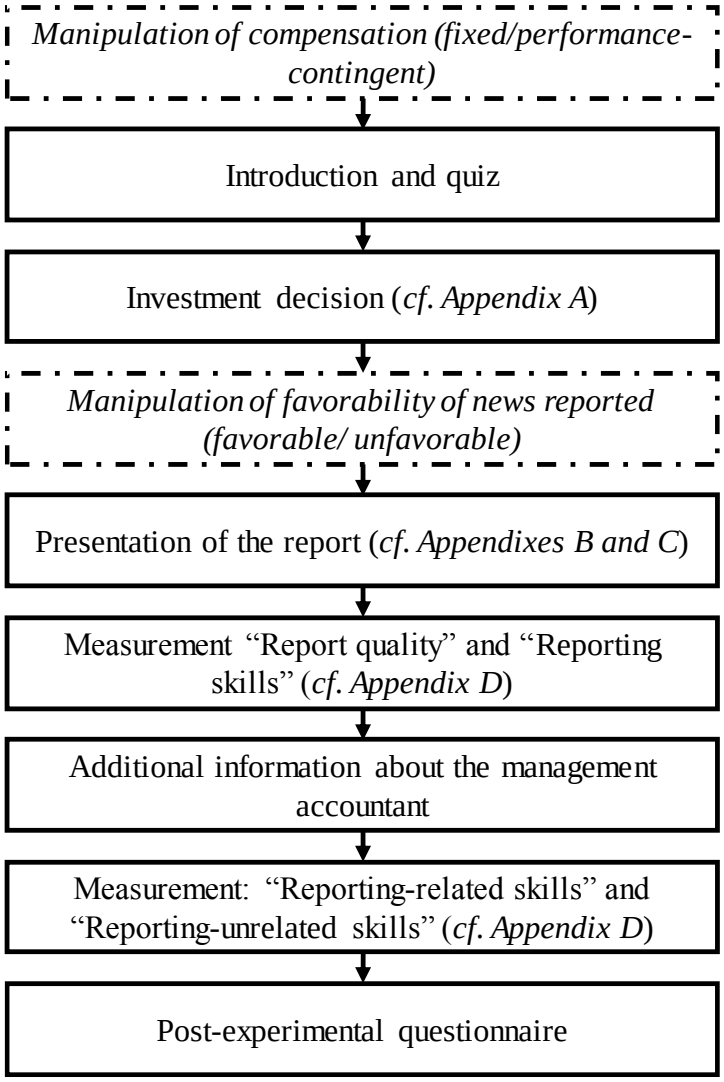
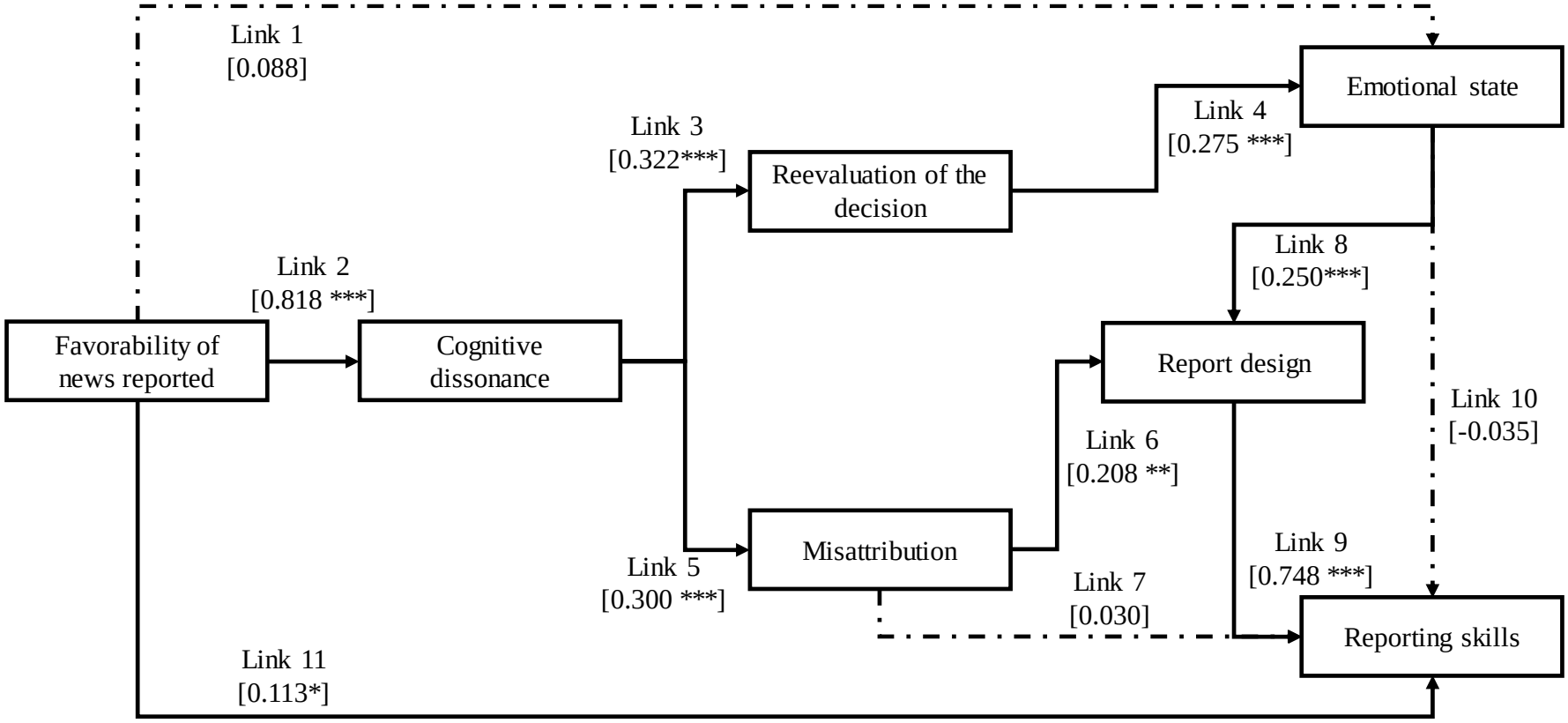


Figure 2 Underlying processes regarding distorted subjective performance evaluations [standardized regression weights]



*, **, *** Significant at the < 0.10, < 0.05 and < 0.01 levels, respectively.

TABLE 1
Descriptive statistics (mean, [standard deviation])

	Favorability of news reported						**Total**
	Unfavorable			Favorable			
	Management compensation			Management compensation			
	Fixed compensation	Performance-contingent compensation	**Total**	Fixed compensation	Performance-contingent compensation	**Total**	
Number of subjects	31	34	**65**	23	26	**49**	**114**
Performance appraisal (before description)[a]							
Reporting skills	63.42 [25.27]	66.00 [25.54]	**64.77 [25.25]**	72.70 [14.46]	77.50 [11.68]	**75.24 [13.14]**	**69.27 [21.48]**
Performance appraisal (after description) [a]							
Report structuring skills	64.71 [22.82]	62.74 [22.63]	**63.68 [22.56]**	71.96 [17.04]	76.92 [15.94]	**74.59 [16.48]**	**68.37 [20.81]**
Report designing skills	59.19 [22.91]	58.59 [22.32]	**58.88 [22.43]**	68.04 [15.51]	65.96 [19.55]	**66.94 [17.62]**	**62.34 [20.80]**
Business understanding	57.65 [23.53]	54.85 [17.64]	**56.18 [20.54]**	63.91 [14.14]	69.04 [15.94]	**66.63 [15.19]**	**60.68 [19.08]**
Factor: Reporting-related skills[b]	-0.16 [1.15]	-0.30 [1.02]	**-0.23 [1.08]**	0.25 [0.67]	0.36 [0.90]	**0.31 [0.80]**	**0.00 [1.00]**
Teamwork	32.84 [22.18]	41.56 [22.03]	**37.40 [22.36]**	38.57 [18.53]	42.88 [19.14]	**40.86 [18.78]**	**38.89 [20.88]**
Personality	67.39 [23.31]	71.91 [22.95]	**69.75 [23.05]**	70.78 [20.91]	75.50 [19.97]	**73.29 [20.34]**	**71.27 [21.90]**
Factor: Reporting-unrelated skills[b]	-0.25 [0.99]	0.14 [1.04]	**-0.05 [1.03]**	-0.07 [0.99]	0.18 [0.95]	**0.06 [0.97]**	**0.00 [1.00]**

TABLE 1 continued

[a] For details regarding our variables, especially the underlying questions, see Appendix D.

[b] The variable "reporting-related skills" was obtained through principal component analysis (PCA) of three questions asking about "report structuring skills", "report designing skills", and "business understanding". The variable "reporting-related skills" was obtained through PCA of two questions asking about "teamwork" and "personality". The number of extracted factors was determined by an eigenvalue greater than 1. The factors were assigned by factor loadings greater than 0.5 through Varimax rotation. Finally, a regression results in a standardized factor score that has a mean of 0 and a variance of 1. Hence, negative scores indicate below-average appraisals, and positive scores indicate above-average appraisals for the management accountant.

TABLE 2

Test H1: Results of the effect of favorability of news reported on reporting skills (ANOVA)

Dependent variable: Reporting skills (n = 114)

Source	*df*	MS	*F*-Statistic	*p*-value
Favorability of news reported	1	3,005.75	6.79	< 0.01[a]
Management compensation	1	379.77	0.86	0.36[b]
Favorability of news reported × Management compensation	1	34.43	0.08	0.39[a]

[a] The p-value is reported on a one-tailed basis due to the directional hypothesis for this effect.
[b] The p-value is reported on a two-tailed basis due to the lack of a directional hypothesis for this effect.

TABLE 3

Test H2: Planned contrast comparison between the favorability of news reported and management compensation[b]

Dependent variable: Reporting skills (n = 114)

Source	*df*	MS	*F*-Statistic	*p*-value
Model contrast	1	3,377.22	7.63	< 0.01[a]

[a] The *p*-value is reported on a one-tailed basis due to the directional hypothesis for this effect.
[b] The contrast coefficients are -2 for the unfavorable news reported/performance-contingent compensation condition, -2 for the unfavorable news reported/fixed compensation condition, +1 for the favorable news reported/fixed compensation condition, and +3 for the favorable/performance-contingent compensation condition.

TABLE 4

Test RQ: Results of the effect of favorability of news reported on reporting-related and reporting-unrelated skills (ANOVA)[c]

Panel A: Effect of favorability of news reported on reporting-related skills (n = 114)

Source	*df*	MS	*F*-Statistic	*p*-value
Favorability of news reported	1	8.02	8.46	< 0.01[a]
Management compensation	1	0.00	0.00	0.97[b]
Favorability of news reported × Management compensation	1	0.42	0.45	0.25[a]

Panel B: Effect of favorability of news reported on reporting-unrelated skills (n = 114)

Source	*df*	MS	*F*-Statistic	*p*-value
Favorability of news reported	1	0.34	0.34	0.56[b]
Management compensation	1	2.76	2.77	0.10[b]
Favorability of news reported × Management compensation	1	0.13	0.13	0.72[b]

Panel C: Model contrast on reporting-related skills (n = 114)[d]

Source	*df*	MS	*F*-Statistic	*p*-value
Model contrast	1	8.04	8.48	< 0.01[a]

Panel D: Model contrast on reporting-unrelated skills (n = 114)[d]

Source	*df*	MS	*F*-Statistic	*p*-value
Model contrast	1	0.74	0.75	0.39[b]

[a] The *p*-value is reported on a one-tailed basis due to the directional hypothesis for this effect.
[b] The *p*-value is reported on a two-tailed basis due to the lack of a directional hypothesis for this effect.
[c] The dependent variable "reporting-related skills" was obtained through principal component analysis (PCA) of three questions: "report structuring skills", "report designing skills" and "business understanding". The dependent variable "reporting-related skills" was obtained through PCA of two questions: "teamwork" and "personality". The number of extracted factors was determined by an eigenvalue greater than 1. The factors were assigned by factor loadings greater than 0.5 through Varimax rotation. Finally, a regression results in a standardized factor score that has a mean of 0 and a variance of 1. Hence, negative scores indicate below-average appraisals, and positive scores indicate above-average appraisals for the management accountant.
[d] The contrast coefficients are -2 for the unfavorable/performance-contingent condition, -2 for unfavorable/fixed, +1 for favorable/fixed, and +3 for favorable/performance-contingent.

Appendix A

ELICS „Running Guide“ Part (1/2)

Please find below further details about one of the two projects - the ELICS „Running Guide“.

Features:

- The “Running Guide” is a running shoe with a built-in GPS transmitter and receiver. Before the workout starts, you may generate a new route or choose an existing route by means of an App.
- A short vibration signal within the shoe tells the user which route to follow when they reach a junction or an intersection.
- A wireless Bluetooth-connection allows you to monitor the route with an App.

Target Group:

- Adventurers and explorers
- Athletes who like to explore new routes
- Athletes who jog through challenging terrain, as they may be located by the GPS transmitter in case of an accident

The marketing department has presented the new product design to prospective customers. The following three statements represent their answers, about equally weighted.

Steven (37): *„I love to hike and to climb mountains in the Alps. The ELICS „Running Guide“ can help me plan my trips better and I would not have to look up the routes in the map all the time. Since I often take these trips on my own, it is particularly important for me that people find me quickly if I have an accident.*

Mathias (26): *„I always use an App saving my route when I jog. I do not need a vibrating shoe showing me the way.*

Lisa (21): *„I like to jog in my free time and I really love to explore new routes. With the „Running Guide“ I would not get lost that often anymore and I could discover new interesting routes.*

Appendix A continued

ELICS „Running Guide“ Part (2/2)

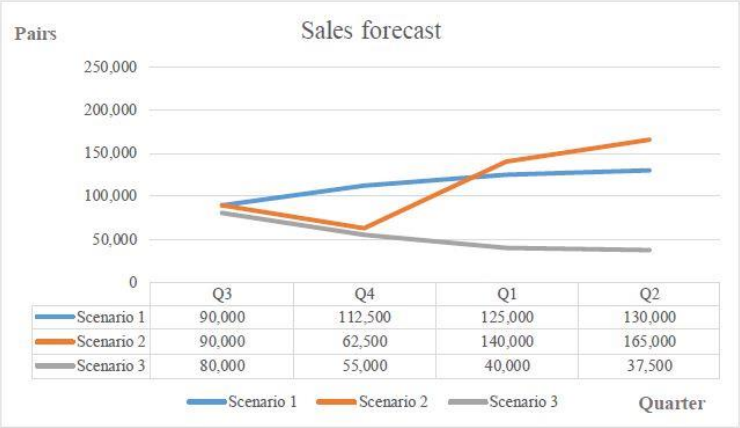
Sales and Cost Forecast:

The company intends to sell the ELICS „Running Guide“at a price of EUR 210.00 and the marketing department has prepared three typical scenarios (s. below). The costs for the licenses are included in the calculation. Please note that these scenarios only represent a rough planning. The actual results may differ from the forecast.

Scenario 1 (Likelihood of occurrence 40 %): The sales figures of the „Running Guide“ remain fairly constant. The respective costs amount to EUR 50.25m. during the planning period. The sales figures reach a total of EUR 96,075.00.

Scenario 2 (Likelihood of occurrence 10 %): During the first quarter, the sales figures are quite low at first due to the winter season, but they may increase considerably during the following quarters and culminate in 457,500 pairs of shoes sold during this period with costs amounting to EUR 50.25m.

Scenario 3 (Likelihood of occurrence 50 %): According to Scenario 3, the product does not secure market acceptance. The cost estimate also amounts to EUR 50.25m and the sales figures to EUR 44,625.00.



Sales forecast "Running Guide"

Appendix B

ELICS

Results of the Project "Running Guide"

(Compiled by Michael Schwartz; Department of Management Accounting)

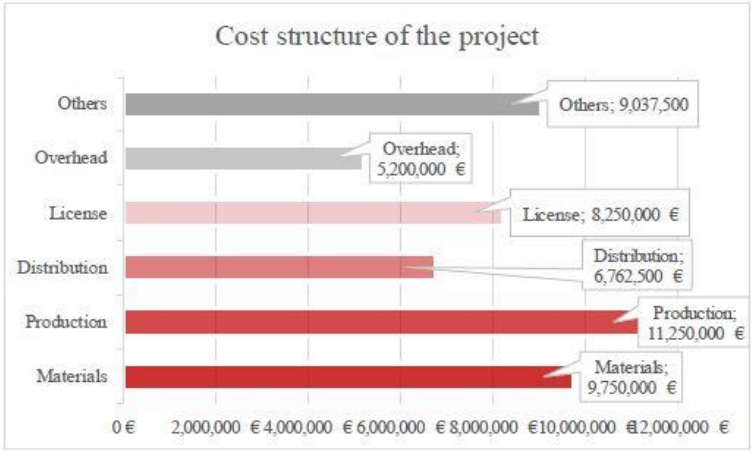
The project generated a **profit of EUR 45.83m**.

Project outcome calculation	
Revenues:	96,075,000.00 €
Direct project costs:	
- Materials:	9,750,000.00 €
- Production:	11,250,000.00 €
- Distribution:	6,762,500.00 €
- License:	8,250,000.00 €
- Others:	9,037,500.00 €
Preliminary project outcome:	51,025,000.00 €
- Overhead:	5,200,000.00 €
Project outcome:	**45,825,000.00 €**
Return on sales:	48%
Return on investment:	91%

The costs of the project slightly exceed the forecast and total EUR 50.25m. The graph at the right details the distribution among the corresponding cost items. Note that the cost item "License" comprises the total costs for licenses for the entire project. The cost item "Overhead" represents a share of the company overheads allocated to the project. The cost item "Others" includes a share of 30 % for return shipments and complaints.

The total **turnovers** of the project amount to EUR 96.08m. Please find the corresponding distribution in the table to the right:

Overall turnover:	**96,075,000.00 €**	
Regional/ seasonal distribution:		
thereof domestic:	67,252,500.00 €	70%
thereof foreign:	28,822,500.00 €	30%
thereof Q1:	21,136,500.00 €	22%
thereof Q2:	26,901,000.00 €	28%
thereof Q3:	30,744,000.00 €	32%
thereof Q4:	17,293,500.00 €	18%
Customer distribution:		
thereof wholesale:	69,174,000.00 €	72%
thereof retail:	9,607,500.00 €	10%
thereof online:	17,293,500.00 €	18%



Appendix C

ELICS

Results of the Project "Running Guide"

(Compiled by Michael Schwartz; Department of Management Accounting)

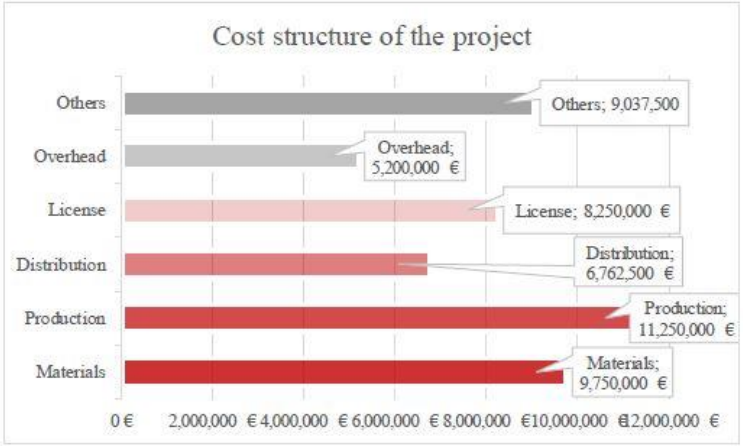
The project incurred **losses of EUR 5.63m**.

Project outcome calculation	
Revenues:	44,625,000.00 €
Direct project costs:	
- Materials:	9,750,000.00 €
- Production:	11,250,000.00 €
- Distribution:	6,762,500.00 €
- License:	8,250,000.00 €
- Others:	9,037,500.00 €
Preliminary project outcome:	-425,000.00 €
- Overhead:	5,200,000.00 €
Project outcome:	**-5,625,000.00 €**
Return on sales:	-13%
Return on investment:	-11%

The costs of the project slightly exceed the forecast and total EUR 50.25m. The graph at the right details the distribution among the corresponding cost items. Note that the cost item "License" comprises the total costs for licenses for the entire project. The cost item "Overhead" represents a share of the company overheads allocated to the project. The cost item "Others" includes a share of 30 % for return shipments and complaints.

The total **turnovers** of the project amount to EUR 44.63m. Please find the corresponding distribution in the table to the right:

Overall turnover:	**44,625,000.00 €**	
Regional/ seasonal distribution:		
thereof domestic:	31,237,500.00 €	70%
thereof foreign:	13,387,500.00 €	30%
thereof Q1:	9,817,500.00 €	22%
thereof Q2:	12,495,000.00 €	28%
thereof Q3:	14,280,000.00 €	32%
thereof Q4:	8,032,500.00 €	18%
Customer distribution:		
thereof wholesale:	32,130,000.00 €	72%
thereof retail:	4,462,500.00 €	10%
thereof online:	8,032,500.00 €	18%



Appendix D

Evaluation set one (each evaluation on a separate screen):

Please rate the graphic representation of the report on a scale from 0 (very bad) to 100 (very good).

Please rate Mr. Schwartz's performance with respect to the development of the report on a scale from 0 (very bad) to 100 (very good).

Please assess how experienced Mr. Schwartz is in preparing results reports on a scale from 0 (little experienced) to 100 (very experienced).

Participants are then presented with additional information.

Evaluation set two (all evaluations on the same screen):

Please rate the following skills of Mr. Schwartz on a scale from 0 (does not apply at all) to 100 (fully applies).

1. Mr. Schwartz is able to prepare and structure information clearly.
2. Mr. Schwartz is able to create charts and graphics in a way that is transparent and well designed.
3. Mr. Schwartz has a deep understanding of business correlations.
4. Mr. Schwartz is a team player.
5. Mr. Schwartz is a likeable person.
