HOW SOCIAL AND ENVIRONMENTAL ACCOUNTING AND REPORTING CAN AFFECT CORPORATE DECISION MAKING

AN EMPIRICAL ANALYSIS OF CRITICS, DRIVERS, AND FURTHER DEVELOPMENTS

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Dedicated to my wonderful family
especially

to my partner
Peter

to my mother and father
Brigitte and Hansjörg

to my sister
Theresa

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EXECUTIVE SUMMARY

Companies increasingly use social and environmental accounting and reporting (SEAR) to measure, manage, and report their influence on ecological and social issues, i.e., climate change and human rights violations. One reason for the increased use of SEAR is that companies aim to support sustainable aspects in their business decision-making.

Nowadays, there are many different tools, frameworks, and standards for SEAR that companies can use. Beyond the content presented in the tool itself, e.g., social and/or ecological information, these tools differ, among others, by the language used and the type of data collected (e.g., qualitative, quantitative, or monetary data). One the one hand, the range of different approaches for SEAR allows industry- and company-specific monitoring and reporting of sustainable issues. On the other hand, this variety as well as the lack of a common reference framework can lead to uncertainty of corporate decision-makers and stakeholders regarding the use and comparability of these approaches. While numerous previous scholars present advantages and opportunities of the use of SEAR for companies and society, there is a rising number of scholars criticizing the way (social and environmental) accounting and reporting is used today and its impact on a company's environmental orientation and decision-making. Further, there is only limited literature on the question of which approach to use and how to use and introduce the particular approach for supporting sustainable decision-making within companies.

This dissertation aims to expand previous literature by clarifying the effects of SEAR on corporate decision-making and its influencing factors. Additionally, antecedents for implementation and use of SEAR in regard to supporting sustainability decision-making are discussed. For this purpose, the given dissertation investigates public sustainability reports by companies with different environmental orientation, conducts two survey-based case studies on the effects of different types of SEAR and one qualitative case study on the antecedents of institutionalizing management accounting change through SEAR.

The results lead to seven criteria that practitioners and researchers should recognize for supporting successful SEAR regarding a company's environmental orientation, the role of employees and leadership as well as the specific SEAR tool itself. Additionally, this dissertation leads to several contributions to the scientific discussion and its influences on corporate environmental orientation and decision-making.

1. Introduction

Previous research highlights the role of companies in creating global social and ecological problems. For example, Frumhoff et. al (2015) state that only 90 large companies reduced over 60% of global carbon dioxide and methane emissions in the period from 1751 to 2010, and Paust (2002) highlights the responsibility of global companies for respecting human rights in their international supply chains. With this issue in mind, there is a rising number of researchers, politicians, and practitioners that are analyzing and developing approaches to support sustainable businesses (Lehman & Kuruppu, 2017) and numerous companies monitoring and reporting sustainability aspects (Jeffrey & Perkins, 2013; Velte & Stawinoga, 2016).

The quote “what gets measured, gets managed” by Peter Drucker should be kept in mind when talking about sustainable activities of companies (Haupt & Hellweg, 2019). In the discussion about sustainability, social and environmental issues are often discussed in qualitative terms, i.e., the impact of companies on human rights in global supply chains or the effects of business activities on biodiversity. In fact, previous studies show that companies often publish quantitative financial information on economic aspects, i.e., sales and market development, but use nonfinancial and often qualitative information when reporting about sustainability issues and effects (Ballou et al., 2006). Consequently, scholars criticize corporate sustainability reporting for providing mostly qualitative information and neglecting quantitative details (Daub, 2007; Roca & Searcy, 2011). With this issue in mind, previous scholars support the assumption that quantitative measurements and targets are necessary to analyze and compare a company’s influence on sustainability issues and to make sustainability issues a part of corporate strategies and decision-making besides economic aspects (Daub, 2007; Popovic et al., 2018; Roca & Searcy, 2011). Corporate accounting and reporting can therefore be understood as an important part of achieving sustainability goals.

In the last few decades, a large number of SEAR tools, standards, and frameworks has been developed that aim at enabling companies to transparently report their impact on sustainability and support more sustainable decision-making by companies and their stakeholders (Contrafatto & Burns, 2013). In this way, SEAR is supposed to be able to support sustainable business activities and reduce social and environmental problems (Mildenberger, 2018). By integrating the company’s impacts on sustainability that are often hidden in conventional accounting and reporting (Unerman et al., 2018), scholars reveal that SEAR can lead to more transparent and objective decisions (Sunstein, 2002).

However, there is a rising number of researchers that criticize the influence of the way (social and environmental) accounting and reporting is used today on sustainability issues (e.g., Cuckston, 2018; Gray et al., 1995; Hines, 1991, 1992). Accounting and reporting are criticized for highlighting the economic aspects of a decision situation, while neglecting social and environmental aspects. A rational use of economic approaches, i.e., accounting and reporting, may lead decision-makers to use economic facts “to justify the destruction of nature” (Cuckston, 2018, p. 220). Accordingly, the use of accounting and reporting is criticized for supporting economic arguments and giving sustainability aspects less attention in corporate decision-making (Hines, 1991, 1992).

The business environment of a company, i.e., its customers and competitors, and a company’s environmental orientation can influence the way a company deals with sustainability and its use of SEAR. For example, when a company’s business environment demands justification and explanation for the business activities of a company and its effects on sustainability, the particular company may use SEAR approaches to legitimate the company’s activities to its stakeholders (Schaltegger, 2012). This is why it is necessary to link research on environmental orientation of companies and research that discusses the use of SEAR to understand its effects and influences on corporate decision-making. This link can lead to solution-oriented results that focus on real options in decision-making and the development of tools that support sustainable decisions.

For supporting sustainable decisions of companies through research, a better understanding of SEAR and its influence on corporate decision-making is needed. In the past decades, a variety of new approaches and tools for SEAR has already been introduced by researchers and practitioners. This dissertation pays special attention to the management accounting tool ‘value creation accounting’ (VCA; German ‘Wertbildungsrechnung’), which was developed in the 1990s by the German drug store chain dm-drogerie markt and modified by the German wholesaler of organic food and beverages Alnatura. VCA especially addresses the environmental orientation of a company and aims to support sustainability in corporate decision-making (Hummel, 2016).

This dissertation aims to shed light on the interlink between SEAR and the consideration of sustainable aspects in corporate decision-making. Therefore, the previous discussion about the possibilities and challenges of SEAR is considered for supporting sustainable economic decision-making. The main goal is to work out the drivers, antecedents, and success factors of SEAR for supporting sustainable decision-making of companies by investigating empirical data, and to give practitioners and politicians ideas on how to support corporate sustainable behavior by using and further developing SEAR.

In order to do so, four studies were conducted. The **first study** focuses on the influence of environmental orientation on the extent of sustainability reporting. Therefore, it distinguishes between companies with differences regarding environmental orientation following Hockerts and Wüstenhagen (2010). The second and third study correspond to the effects of different types of SEAR on corporate decision-making in regard to sustainability. Therefore, the **second study** focuses on the effects of types of environmental information on the WTP (willingness to pay) in economic decision-making scenarios. It distinguishes between qualitative, quantitative, and monetary environmental information. The **third study** analyzes the influence of language design of accounting on WTP in economic scenarios and its influence on the importance ascribed to social aspects in business decision-making. The **last study** was conducted with a focus on antecedents for supporting management accounting change within companies in regard to sustainability. It analyzes the antecedents for implementation and use of VCA within a qualitative case study at a German wholesaler of organic food and beverages.

The dissertation aims to provide insights into the effects and challenges of the introduction and use of new SEAR approaches and thereby enables actors to utilize SEAR in economic decision-making. It gives impressions for further developments of current SEAR approaches and best practice experiences for companies as well as politicians and researchers. The rest of the dissertation is organized as follows: First, a literature review on the development of SEAR as well as a discussion about the influence of accounting and reporting on social and environmental aspects in corporate decision-making is presented. Having this discussion in mind, the research gaps and questions this dissertation addresses are derived in the subsequent section. In the next part, the conceptual framework and methods of the four studies included in this dissertation are presented. The fourth chapter presents the findings, which consist of four separate studies addressing the outlined research questions. The subsequent chapter discusses and links the results of the four studies and outlines seven criteria for SEAR investigated in this dissertation. The last section presents several contributions of this dissertation to previous research and business practice. The four paper included in this dissertation are presented in the appendix.

2. Background

2.1. The Use of SEAR

The important role of companies in supporting global sustainability issues has increasingly gained attention over the past decades (e.g., Furmhoff et al., 2015; Paust, 2002). Consumers respond to this trend with their purchasing behavior, which shows up in a rising demand for products produced respecting specific ethical and/or ecological standards. A well-known example is the certification system of ‘fair trade,’ which has realized significant increases in sales during recent decades (Zander & Hamm, 2010). Furthermore, the communication of sustainability information regarding consumption decisions by consumers has increased (Grunert et al., 2014). Previous studies show that consumers are interested in sustainability information and these information can influence purchasing decisions (Zander and Hamm, 2010). For example, by providing information on the amount of CO2 emissions, Petersen et. al. (2021) show how information on unfavorable and favorable environmental product performance affects consumer’s WTP. Additionally, many ethical and ecological norms and certifications were developed that “are increasingly becoming the condition for cooperation with international and domestic clients” (Miller et al., 2018, p.3). Further, previous research points out the rising demand for corporate sustainability information by investors (Berthelot et al., 2012). This is supported by the positive effects of proactive sustainability activities of companies on the company’s evaluation by investors (Lo & Sheu, 2007). Besides the increasing demand from stakeholders, i.e. customers and investors, the legal requirements for companies with regard to sustainability are increasing as well (for example, the European Union’s so called CSR directive, which was enacted in 2014, see Maniora, 2015).

Many companies reacted to this rising demand by developing and using new SEAR tools and frameworks to consider sustainability issues in their business activities (Christ & Burritt, 2013; Mani et al., 2018). For example, companies increasingly published social and environmental reports (Dhaliwal et al. 2011; Jeffrey & Perkins, 2013; Lozano 2012) and integrated social and ecological issues into their decision-making or reporting both voluntarily and non-voluntarily in recent years (Deegan, 2017; Mani et al., 2018; Schaltegger et al., 2017; Velte & Stawinoga, 2016). In this way, SEAR can help companies to “design, measure and communicate the results of corporate sustainability performance” (Nikolau & Tsalis, 2013, p. 76).

Meanwhile, the academic discourse about SEAR has increased as well (e.g., Contrafatto & Burns, 2013; Windolph et al., 2014). The aim of SEAR research is to develop analytical tools to understand companies’ influence on sustainable development and to support companies to improve their activities and decisions made in regard to sustainability (Contrafatto & Burns, 2013). In previous research, various tools for accounting and reporting sustainability information were developed (Schaltegger et al., 2002; Windolph et al., 2014). Many researchers and practitioners confirm the importance of SEAR approaches to undertake essential practices to attain the main goals of sustainable development by supporting sustainable business decisions (Huizing and Dekker, 1992; Jasinski et al., 2015; Nikolau & Tsalis, 2013).

When discussing SEAR, a distinction has to be drawn between sustainability accounting on the one side, and sustainability reporting on the other side. Firstly, sustainability accounting is mainly used as an internal approach to identify, collect and prepare environmental and social information and to inform internal and external stakeholders (Deegan, 2017). Secondly, sustainability reporting is mainly used to inform internal and external stakeholders about a company's sustainability activities (Amran and Haniffa, 2011). However, sustainability reporting and sustainability accounting are closely related, as sustainability reporting also affects company's data collection and internal decision-making and thus influences sustainability accounting (Qian and Schaltegger, 2017) .

Numerous studies analyze the use and design of corporate sustainability reporting based on institutional theory (e.g., Deegan & Unerman, 2006; Higgins & Larrinaga 2014). This research found that companies often base their decisions around sustainability reporting on institutional pressures instead of strategic considerations (Bebbington et al., 2009). For example, organizations may follow the sustainability reporting practices of other organizations in their environment, and the individual background of their employees might influence the choices made around sustainability reporting (Higgins & Larrinaga, 2014; Larrinaga 2007; Unerman & Bennett, 2004). As a result of these institutional pressures, literature shows that sustainability reports of companies within an organizational field, i.e., the same industry, become homogenous (Deegan & Unerman, 2006; Higgins & Larrinaga, 2014). For example, previous studies found that the majority of public sustainability reports follows the guideline of GRI (del Mar Alonso–Almeida et al., 2014). However, besides the rising number of companies using GRI, there are companies using other less-common frameworks for their sustainability reporting, i.e. the German 'Economy for the Common Good' (ECG; German 'Gemeinwohlökonomie'; Felber, 2015).

A variety of previous literature deals with factors that support or hinder the effects of management accounting change on changes in corporate decision-making practices. However, less attention has been paid to the antecedents for corporate changes in the field of sustainability management, i.e. the use of new SEAR tools, in previous literature (Hummel & Hörisch, 2020; Parker, 2012; Wanderley & Cullen 2013). This is why Wanderley and Cullen (2013, p. 304) call for the use of qualitative research to "reveal the human, social world behind the numbers that require and may trigger new management accounting practices".

2.2. Critics on SEAR

Despite the increasing discussion about SEAR approaches in theory and practice, it is frequently criticized that companies do not sufficiently consider the consequences of their activities for global sustainability issues in their decision-making (Deegan, 2017; Rossoni et al., 2020). In previous literature, the reasons for this are varied and discussed from different perspectives.

First, the variety of standards and management solutions for SEAR that were developed over the past decades (Farooq & de Villiers, 2019; Maniora, 2015) and the issue that there is no common reference framework for companies lead to confusion for companies as well as for their stakeholders considering the use and effects of different types of SEAR (Müller et al., 2015; Perrini & Tencati, 2006). This ambiguity creates "undesired effects among companies and their stakeholders" (Perrini & Tencati, 2006, p. 299), for example difficulties for stakeholders to compare and evaluate sustainability activities of different companies and a slowdown in development and implementation of sustainability innovations (Perrini & Tencati, 2006).

Second, previous research criticizes the influence of (social and environmental) accounting and reporting approaches on economic decision-making in regard to sustainability. Scholars fear that the way accounting and reporting is used by companies can have consequences on the perception of sustainability issues by decision-makers and sustainable or unsustainable behavior of companies, beyond the objective numbers itself (Boiral, 2016; Sullivan & Hannis, 2017). For instance, Hines (1991) argues that the use of accounting approaches may lead to more economic and less sustainable decisions and may reduce the sustainable awareness of decision-makers. Further critics fear that accounting and reporting as well as economically oriented SEAR may support the unsustainable behavior of companies by focusing the decision-makers attention on economic aspects in decision-making (Cooper & Senkl, 2016; Cuckston, 2018). Additionally, separate SEAR approaches are criticized for not being linked to the economic decision-making of companies, as SEAR is often used as additional report or tool and thus may have little influence on business strategies and sustainability aspects in business decision-making (Hörisch et al., 2014).

Third, while there is a variety of different SEAR approaches introduced in previous literature, there is no clarity about the corporate factors influencing the use of SEAR besides the specific tool itself. Previous literature found that a change in a company's management accounting does not necessarily and automatically change a company's decision-making procedures (Burns & Scapens, 2000). Instead, there are several corporate factors that support or hinder institutionalizing management accounting change within companies, which may lead to changes in decision-making procedures. Therefore it can be assumed that the successful implementation and use of SEAR tools and frameworks requires some specific antecedents in order to affect a company's decision-making procedures. Since there is not much previous literature analyzing the antecedents and determinant factors of the use of SEAR, researchers explicitly call for future studies to address this issues (e.g., Pertusa-Ortega et al., 2017).

Framing theory deals with the question of how information is described and reported to decision-makers and the influence of this so called "framing" of information on the decisions made (Levin et. al, 1998). This framing of a decision situation can be, for instance, a different language used for describing an equivalent situation or presenting equivalent information in different types of data. Therefore, framing theory supports the assumption that decisions are not only made based on the objective problem at hand, but also on how the problem is described. This is why framing theorists found that "decision-makers respond differently to different but objectively equivalent descriptions of the same problem" (Levin et. al, 1998, p. 150). Additionally, Tversky and Kahneman (1981) highlight that the decision-made is not only influenced by the specific framing of the decision situation, but also "by the norms, habits and personal characteristics of the decision-maker" (p. 453) .

Taking into account the findings of framing theory and the critics on SEAR of previous research leads to the question about the influence of the design of SEAR as a "framing" on the decisions made. Further, this discussion leads to the question about the influence of internal aspects, i.e. structures, values and personal characteristics, on the decisions made around SEAR.

2.3. Value Creation Accounting as SEAR

During the past decades, practitioners and researchers have increasingly discussed and developed different approaches for SEAR (e.g., Contrafatto & Burns, 2013; Lehman & Kuruppu, 2017). This dissertation pays special attention to the use and effects of the management accounting tool called VCA. With the issues and critics about conventional tools for accounting and reporting in mind, companies have introduced VCA in order to decrease the challenges and issues ascribed to conventional accounting and reporting in regard to sustainable decision-making. VCA was developed in the 1990s and is used, among others, by the German organic wholesaler Alnatura (Hummel, 2016; Irle, 2008).

VCA is a tool for management accounting. Compared to conventional management accounting tools, VCA mainly differs in two aspects. First, the language used in VCA for describing single accounts is changed in order to change the perspective of the user. While conventional accounting is criticized for using a cost-oriented language, VCA uses a 'value-oriented' language design that does not highlight the cost effect of an account but the effects of the accounts on a company's value creation. Therefore, it aims to highlight that the values, i.e., 'costs', in accounting are part of the value creation process (Hummel, 2016). In this way, VCA aims at giving social aspects more importance in decision-making. In fact, it uses a language that does not label accounting terms as ‘costs’ (that negatively impact the company’s profit) but highlights the qualitative effects of the single accounts for the stakeholders in the language used. For example, the term ‘staff costs’, which highlights the economic effect of the account on the company (i.e., it decreases sales), is replaced by the term ‘employee income’, which highlights the financial effect of the account for the stakeholders (i.e., as income of people) (Hummel, 2016).

Secondly, the order of the accounts differs from conventional management accounting (Hummel, 2016). Therefore, accounts are divided into four different groups: ‘external services’ for all costs that are charged by external parties, ‘pre values’ for all internal costs that are allocated to the specific cost center, and ‘own values’ for all costs that arise directly at the cost center. Profit or loss is separated between costs on the one hand and sales on the other hand (Hummel, 2016). This structure is based on ideas of the philosopher Rudolf Steiner, who described economic processes from a philosophic perspective (see, Steiner, 1996).

All in all, VCA changes the appearance of conventional accounting (i.e., wording and order of the accounts) in order to highlight sustainability, i.e., social aspects, as consequences of business decisions and therefore support sustainable issues in business decision-making. This is why this dissertation understands VCA as an approach for SEAR, even if VCA mainly monitors and reports financial terms.

2.4. Gaps and Research Questions

In this dissertation, the use of SEAR and its influence on social and environmental aspects in corporate decision-making is analyzed. Reflecting on the state of the art in SEAR revealed some research gaps. Firstly, numerous previous studies investigate the use of SEAR in light of institutional theory. This literature mainly focuses on the effects of external factors on sustainability reporting, i.e., industry or location. However, only a minority of previous studies analyze the effects of internal factors, i.e., a company’s environmental orientation, on the use of sustainability reporting.

Secondly, scholars criticize the (negative) influence of the current use of accounting and reporting on social and environmental issues (e.g., Hines, 1988, 1991). While there is a wide debate about the potential negative effects of the current use of conventional accounting and reporting on sustainability issues, little empirical evidence on this influence has been gained so far.

Thirdly, the effects of new SEAR tools and the antecedents for a management accounting change in the field of sustainable decision-making open a research gap.

The focus of this dissertation is on the use of SEAR and its influence on corporate decision-making. Thus, the aim of this dissertation is to expand previous research on SEAR and contribute to the further development of SEAR approaches for companies. In doing so, this dissertation project addresses the following core research question:

How can SEAR contribute to the sustainable decision-making of companies?

In order to address this research question, four sub-objectives are followed to address the gaps in different core themes:

1. How does the environmental orientation of companies influence their sustainability reporting?
2. How does the provided type of environmental information influence decision-making within companies?
3. How does the language used in accounting influence decision-making within companies?
4. What are the barriers and drivers of institutionalizing ‘value creation accounting‘ as management accounting change?

Table 2 provides an overview of the research gap and related research questions investigated in the four papers.

Table 1. Overview of gaps and related research question

	Paper 1	**Paper 2**	**Paper 3**	**Paper 4**
	Influence of environmental orientation on SEAR	Influence of type of SEAR on economic decision-making		Drivers and barriers for institutionalizing SEAR
Gap	Little attention has been paid to internal drivers of SEAR, especially the role of environmental orientation, in previous studies. Also, there is a scientific and business debate about the influence of SEAR on (un-)sustainable behavior of companies. However, less empirical data has investigated these effects so far. Further, little knowledge is gained about antecedents of new SEAR approaches, i.e., VCA.			
Background	Institutional theory research identifies several external factors that influence the design of sustainability reporting. However, less attention has been paid to internal factors that influence sustainability reporting, especially the role of environmental orientation.	The way in which information is provided can influence decision-making besides the content of information itself. In regard to sustainability, environmental information can be provided in qualitative, quantitative physical, or quantitative monetary forms.	Previous research identifies language changes as one possible mechanism to support social aspects in business decision-making. However, the influence of the language used for accounting terms has not been elaborated in detail so far.	Research on management accounting change identifies certain antecedents for creating change in decision-making by using new management accounting tools. However, less attention has been paid to the antecedents in the field of SEAR, i.e. the use of VCA.
Research Question	*How does the environmental orientation of companies influence their sustainability reporting?*	*How does the type of environmental information provided influence decision-making within companies?*	*How does the language used in accounting influence decision-making within companies?*	*What are the drivers and barriers for institutionalizing VCA as management accounting change?*

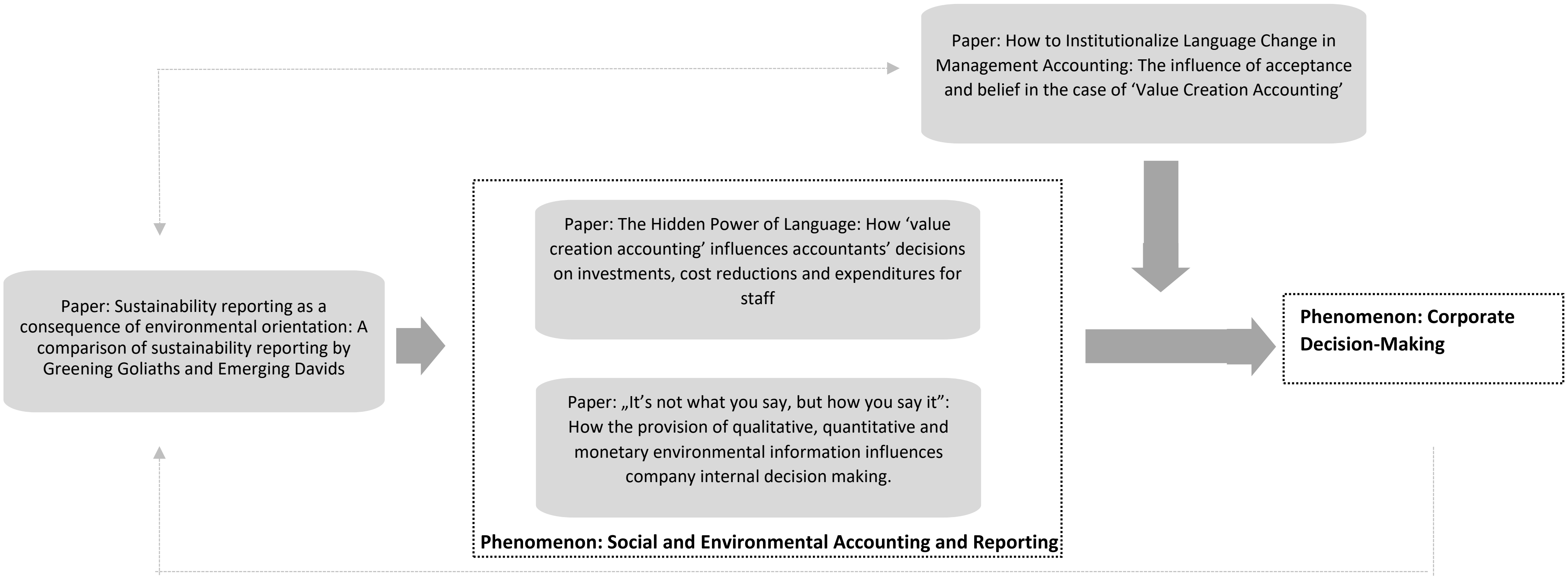
3. Concept and Design

3.1. Conceptual Framework

This dissertation transports the findings of framing theory into the field of SEAR and assumes that decisions made around SEAR are influenced by the design of SEAR as a "framing" on the one side and by internal aspects, i.e. "the norms, habits and personal characteristics of the decision-maker" (Tversky and Kahneman, 1981, p.453) on the other side.

Today, there is a variety of different SEAR approaches, standards, and tools. The first question that arises is how companies choose their type of SEAR. As framing theory states that decision-making is influenced by internal aspects, this dissertation therefore focuses on the influence of corporate environmental orientation on the choice of social and environmental reporting. The framing of SEAR used in the company may in turn influence the decisions made within the company. The study therefore next elaborates the influence of different types of SEAR on the recognition of sustainability issues in corporate decision-making. The focus here is particularly on the type of data used and the language design of SEAR as a kind of framing of decision-situations. In addition to the influences of types of SEAR, changes in decision-making procedures through the use of SEAR may require some corporate antecedents. Therefore, the fourth study in this dissertation lastly investigates some antecedents for institutionalizing management accounting change through the use of SEAR, using the example of VCA.

Besides the investigated influences, there are several further influences, e.g., the effects of corporate environmental orientation on the change process itself, that are beyond the scope of this investigation and thus were not assessed in this dissertation. Figure 1 illustrates the investigated and not investigated effects, the link between the phenomena, as well as the related paper.



Legend:

investigated influence
not investigated influence

Figure 1. Conceptual framework

3.2. Methods Used

The following section briefly presents the used research forms and methods for this dissertation. For a complete description of the used methods, see the full paper in the appendix.

The first study compares sustainability reports published by companies with differences regarding environmental orientation, following the approach by Hockerts and Wüstenhagen (2010). While companies that follow a proactive sustainability approach and integrate sustainability targets into their core business strategy are classified as Emerging Davids, companies with a more reactive sustainability approach, that follow sustainability targets mainly due to external pressures, are defined as Greening Goliaths. The study investigates the sustainability reporting of 74 German companies that were matched for corporate characteristics to increase comparability (Buhr & Freedman, 2001). The sample's reports were examined for the use of GRI guidelines, the provision of a third-party assurance statement, and for further control variables, i.e., the year of publication. A binary logistic regression is used to investigate the factors which affect the likelihood of using GRI and providing third-party assurance statements for sustainability reporting.

Using a survey-based experiment, **the second study** investigates the influence of providing different types of environmental information, i.e., qualitative, quantitative-physical, and quantitative-monetary, on WTP in economic decision-making. Business students from two German universities took part in a survey-based experiment. Three scenarios were set up in which participants had to enter their WTP for a purchasing decision of a production machine. In each scenario, participants were opposed with four purchasing options where the environmental effects as well as the financial information were varied. While financial information about the investment was the same in all three scenarios, the type of environmental information was different. Participants were provided with information about the environmental performance of the machine in qualitative (scenario 1), in quantitative-physical (scenario 2), and in quantitative-monetary terms (scenario 3). In addition to WTP, participants were asked for some personal attitudes to check for interfering effects. In order to test the hypotheses, generalized estimating equations were used.

The third study focuses on the effects of the language used in management accounting on business decision-making in regard to social aspects. For this purpose, a survey based experiment with two different scenarios was set up for business students from a German university. The participants were given details about a fictional company and its management accounting estimate. In the first scenario, the data was presented using VCA's language terminology, while the second scenario uses traditional accounting terminology. Participants were asked to answer different investment and saving decisions for the given company and, in addition, to give information on some personal attitudes. ANOVA (analysis of variance) tests were used to test the hypotheses.

For the last study, a qualitative case study was conducted at a large German retailer of organic food. 15 semi-structured face-to-face interviews were conducted with managers from the specific company. The interviewees were selected considering their location, gender, working years at the company, and managerial level. The content of the interviews relates to the specific business context, the individual experience and perception of management change processes in regard to VCA and other organizational factors that may influence corporate change processes. A multi-step process was used to analyze the interviews following Mayring (2000).

This overall conceptual framework relies on conceptual argumentation, theoretical cross overs, and a selected review of previous literature to understand the investigated phenomena more generally and to connect the four separate studies.

Table 3 shows an overview of the research articles in this thesis, the research gap they address, as well as publication status, journal and contributions.

Table 2. Overview of research articles, publication status, and contribution

Gap	Title	Status and Journal	Contribution
Influence of environmental orientation on sustainability reporting	Hummel, P. (2020): Sustainability Reporting as a Consequence of Environmental Orientation: A Comparison of Sustainability Reporting by German Emerging Davids and Greening Goliaths	Published 2020 in *Social and Environmental Accountability Journal*	1,0
Influence of type of data on decision-making	Hummel, P. & Hörisch, J. (2020): “It's not what you say, but how you say it”: How the provision of qualitative, quantitative and monetary environmental information influences companies' internal decision-making	Published 2020 in *Journal for Cleaner Production*	1,0
Influence of language design on decision-making	Hummel, P. & Hörisch, J. (2020): The hidden power of language: How ‘value creation accounting’ influences decisions on expenditures, cost reductions and staff costs	Published 2020 in *Sustainability Accounting, Management and Policy Journal*	1,0
Institutionalization of management accounting change, i.e. VCA	Hummel, P. (in press): How to Institutionalize Language Change in Management Accounting: The influence of acceptance and belief in the case of ‘Value Creation Accounting’	Accepted for publication in *International Journal of Sustainable Strategic Management*	1,0
		Total	4,0

4. Summary of the Main Findings of the Included Papers

This section presents the main findings of the four papers included in this dissertation. While paper two, three and four mainly investigate the use and design of sustainability accounting, the first paper focuses on sustainability reporting.

4.1. Sustainability Reporting as a Consequence of Environmental Orientation: A Comparison of Sustainability Reporting by German Emerging Davids and Greening Goliaths

This study investigates differences in the sustainability reports published by German companies classified as Emerging Davids and Greening Goliaths. While institutional theory states that institutional pressures lead to a homogenization of the sustainability reporting by different companies (Higgins & Larrinaga, 2014; Deegan & Unerman, 2006), the given study assumes that Emerging Davids react less to institutional pressures in the field of sustainability reporting compared to Greening Goliaths.

The first analysis could confirm the first hypothesis that Emerging Davids react less to institutional pressures regarding the use of GRI for their sustainability reporting, compared to Greening Goliaths. Results of the binary logistic regression indicate a significant influence of a company's environmental orientation on the use of GRI for the published sustainability reports. Findings show that the likelihood that a company uses the guideline of the GRI is 73% smaller for Emerging Davids than for Greening Goliaths. As previous research found the use of GRI to be a signal for strong institutional pressures, this finding leads to the assumption that companies defined as Greening Goliaths react stronger to institutional pressures than companies defined as Emerging Davids.

The second hypothesis assumes that Greening Goliaths provide a third party assurance statement for their sustainability reports more often than Emerging Davids do. However, the binary logistic regression did not find any significant influence of environmental orientation on providing third-party assurance statements and thus could not confirm hypothesis two. A possible explanation for this finding might be that there are different reasons for providing third-party assurance statements for a sustainability report beyond institutional pressures, for example, to check its correctness or to provide credibility to the report (Velte and Stawinoga, 2017). When interpreting the study, it should be kept in mind that a quantitative analysis of sustainability reports is used, and thus the findings could only investigate the final reports, and give no insights into the reason for the decisions made around reporting.

This research uses institutional theory to analyze effects of environmental orientation on sustainability reporting. It thereby offers new insights into the influences of a company's environmental orientation concerning the various institutional pressures in the field of sustainability reporting. Results show that institutional pressures have less impact on Emerging Davids than on Greening Goliaths regarding the use of the guideline of the GRI for their sustainability report.

4.2. “It's Not What You Say, but How You Say It”: How the Provision of Qualitative, Quantitative, and Monetary Environmental Information Influences Companies’ Internal Decision-Making

The second study investigates the effects of different types of environmental information provided for decision-making on WTP in economic investment decisions.

The first analysis focuses on differences between qualitative environmental information and quantitative-physical environmental information on the participant’s WTP. This analysis could not confirm hypothesis one, which assumes that providing (positive) quantitative environmental information creates higher WTP compared to qualitative environmental information. In the study’s scenarios, no significant differences were found between providing quantitative and qualitative environmental information on the participant’s WTP.

In the second analysis, the study focuses on a comparison of quantitative-monetary and quantitative-physical information provision on the participant’s WTP in economic investment decisions. This analysis could confirm the hypothesis that providing (positive) quantitative-monetary environmental information creates lower WTP compared to quantitative-physical environmental information. Thus, the study shows that the importance ascribed to (positive) environmental information and its influence on decision-making is stronger when environmental performance is provided in quantitative-physical type compared to quantitative-monetary type.

The influence of types of environmental information in regard to environmental performance of the investment on WTP is illustrated in Figure 2. The figure shows that positive environmental performance leads to generally higher mean WTP for the respective investment in all three scenarios. As can be seen from the results, this effect is strongest when providing the environmental information in quantitative, non-monetary information and weakest when providing monetary environmental information.

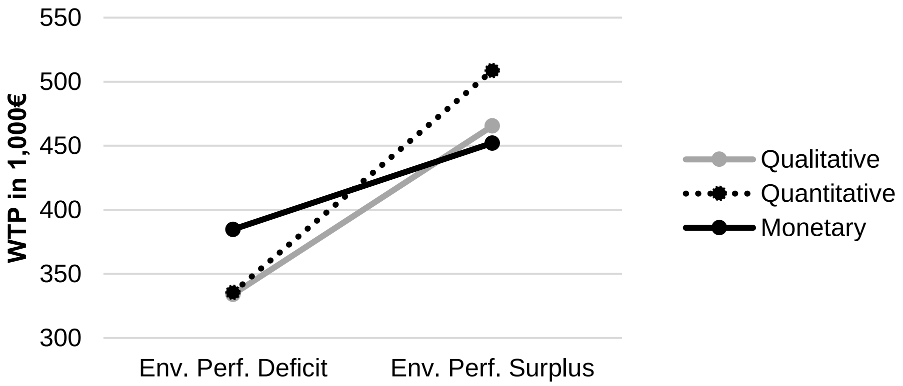


Figure 2. Mean WTP differentiated by information provision and environmental performance (Hummel & Hörisch, 2020b).

Overall, this research shows that presenting environmental information to decision-makers involved in internal investment decisions has the least impact on WTP when the environmental information is provided in quantitative-monetary form, but it has the greatest impact when it is provided in quantitative-physical form. Furthermore, examining the control variables reveals that not only environmental but also financial performance has a substantial impact on WTP, indicating that the respondents were influenced by financial incentives as well.

This study supports previous research by pointing out that providing solely monetized environmental information may devalue these information, and that monetization may reduce the impact of favorable environmental information on WTP in internal decision-making. The priority given to environmental concerns is likely to rise if quantitative physical environmental information is provided.

4.3. The Hidden Power of Language: How 'Value Creation Accounting' Influences Decisions on Expenditures, Cost Reductions, and Staff Costs

This study investigates the effects of the language used in accounting on the importance ascribed to social aspects in business decision-making by differentiating between conventional accounting language and 'value-oriented' accounting language, i.e. VCA. The first analysis focuses on the influence of language design on cost reductions. Results confirm hypothesis one, that decision-makers using conventional accounting make significantly higher cost reductions than decision-makers using VCA. Thus, the language used in accounting tools exerts a significant influence on the level of cost reductions made by the participants.

The second hypothesis assumes that the language used in VCA contributes to a higher willingness to spend compared to conventional accounting language. However, the analysis shows that the chosen scenario did not exert a significant influence on expenditures made in the experiments. Thus, hypothesis two could not be confirmed in the given study.

The analysis found that in times of financial shortage the chosen wording influences the amount of reduction in staff costs made by the participants. Thus, hypothesis three could be confirmed, which reveals that the cuts in staff costs made by participants in the conventional accounting scenario are significantly higher compared to the VCA scenario in times of financial shortage. Findings reveal that value-oriented accounting language can decrease reductions in employee costs in times of financial shortage compared to conventional accounting language.

As assumed by the fourth hypothesis, the given study found that the gender of the participant significantly moderates the effect of the scenario on cost reductions made in the experiment. Findings reveal that the effect of language use in accounting on the level of cost reductions made by the participants is greater among female decision-makers. The participant's gender does not exert a significant influence on expenditures made as well as reductions in staff costs in times of financial shortage. However, as this was not in focus of the given study, these effects were not further analyzed but still provide potential topics for further research. Figure 3 displays the interaction effect of gender and scenario on cost reductions.

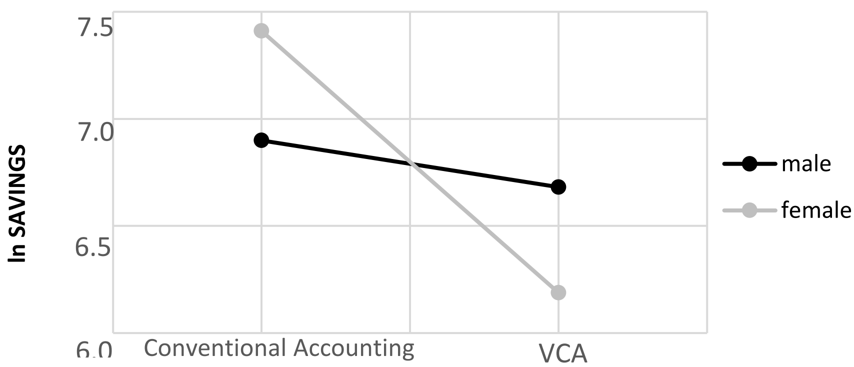


Figure 3. Interaction effect of SCENARIO and GENDER on COST REDUCTIONS (Hummel & Hörisch, 2020a).

Overall, the results of the study show that a value-oriented accounting language, i.e. VCA, can reduce cost savings and increase the priority given to the negative (social) aspects of reducing staff costs. This leads to the conclusion that the language used in accounting should be chosen carefully by considering the possible effects of language in accounting on human behavior and business decision-making regarding the recognition of social aspects.

Thus, the study enlarges the knowledge about the effects of language use in accounting on social sustainability issues and contributes to a better understanding of the relevance of language in accounting and its importance for decision-making beyond the content of accounting (i.e., the numbers) itself. Further studies should prove the results using empirical data from businesses.

4.4. How to Institutionalize Language Change in Management Accounting: The Influence of Acceptance and Belief in the Case of 'Value Creation Accounting'

This study investigates the factors that influence changes in decision-making procedures through the use of management accounting tools, i.e. VCA. Previous studies found that a management accounting change needs to be institutionalized in order to change a company's decision-making procedures (Ansari and Bell, 2009; Burns and Scapens, 2000).

Three types of antecedents for institutionalizing management accounting change are found in previous research that could also be found in the conducted interviews: The first type of antecedent is organizational structure, i.e., the hierarchical structure and ways of internal communication. The second type is culture and leadership, i.e., the role of management and corporate culture. The third type of factors influencing institutionalization of management accounting change is human resources, i.e., the attitude of employees towards change.

Besides these similarities to previous literature, the findings differ from previous research in the role of leadership and employees. The given study reveals that a positive attitude of leaders towards VCA and management change is an essential driver of institutionalizing VCA and thus for influencing decision-making procedures. While previous research found that willingness of leaders is needed when it comes to management accounting change (Burns & Scapens, 2000), the study at hand shows that leaders must not only be open to change their minds and values, but also believe in the benefits and relevance of VCA. In this way, VCA can be 'in place' and thus lead to changes in corporate values, culture and decision-making. This study found the function of leadership as one key influencing factor of institutionalization of management accounting change through the use of VCA.

Further, the study's findings highlight the role of employees as part of the change. As a result, it is important that employees comprehend the intent of VCA and embrace the principles associated with it. Employees must be able to participate in management change, understand and accept VCA and its values, and be open to changing their minds and beliefs.

The study shows that if a management accounting change, i.e., VCA, becomes institutionalized, it can affect a company's values and norms and thus may influence decision-making procedures. The interviews reveal how VCA’s structure and language can institutionalize and construct a particular perspective on economic reality and decision-making within the company. This viewpoint emphasizes the role of social factors in decision-making. VCA may lead to a shift in decision-making procedures in this way.

The study enlarges knowledge on management accounting change by giving insights into institutionalizing of new SEAR approaches, i.e. VCA. Overall, this study indicates several factors that influence the institutionalization of management accounting change. Compared to previous research, findings of the given case study differ mainly in the function and role of leadership and employees.

5. Synthetic Discussion of the Results: Seven Criteria for SEAR

The aim of this dissertation is to reach a better understanding of the use of SEAR and its effects on corporate decision-making. For this purpose, this dissertation investigates the role of corporate environmental orientation concerning the choice of SEAR, the influence of the design of SEAR, i.e. language use and type of data, on corporate decision-making procedures, as well as antecedents of institutionalizing management accounting change through SEAR. The findings of the four studies included in this dissertation lead to seven criteria for development and use of SEAR in research and practice that are presented in the following section.

5.1. Be Aware of Your Corporate Environmental Orientation

A company's environmental orientation can influence decisions made around SEAR. This dissertation examines differences in the published sustainability reports, i.e. in using the GRI guideline, regarding a company's environmental orientation. Findings reveal that, in terms of sustainability reporting, companies with a 'higher' environmental orientation, i.e. Emerging Davids, react less stronger to institutional pressures than companies with a 'lower' environmental orientation, i.e. Greening Goliaths, do.

This leads to the question whether the particular SEAR approach is chosen as a result of strategic considerations and may help to achieve the companies' strategic (sustainability) goals or whether it is chosen as a result of institutional pressures and thus may not fit to the company's strategy or targets. This is particularly relevant as a company's sustainability reporting in turn affects corporate internal decision-making (Quian & Schaltegger, 2017). Therefore it is important to know the underlying reasons for the decisions around sustainability reporting and to check whether they fit to the strategic direction of the company.

Overall, this criteria reveals that decision-makers from companies as well as politicians should be aware of the environmental orientation of the respective company and its influence on the way SEAR is used, as this may influence the company's choice of SEAR.

5.2. Think about the Language You Use

Language influences the way people perceive reality and thereby influences the way people behave (Sandell and Svensson, 2016). The effects of language on human behavior can also be observed in economic decision-making (i.e., language use in accounting), as language design had a significant influence on the decisions made in regards to social aspects in the third study of this dissertation. While conventional accounting language design on the one side supports a more economically oriented decision-making, a 'value-oriented’ language design may support integrating social aspects into economic decision-making.

This dissertation thus highlights the importance of language use in accounting and its influence on decision-makers perception and behavior. Therefore, managers should choose the language used in accounting carefully, being aware of the far-reaching consequences of the choice of language. Since business decisions can have effects that go beyond the direct effects on the respective company (i.e. social effects for employees), the choice of accounting language is particularly relevant as it can influence the perception of these effects and thus the decisions made.

5.3. Provide Management Support

Previous research found that if it becomes institutionalized within a company, management accounting change can influence corporate routines, values, and behavior of employees. Scholars found the role of management and leadership as one key antecedent for supporting institutionalization of management accounting change, i.e. by supporting change processes (Burns and Scapens, 2000). In regards to SEAR, the fourth study of this dissertation confirms the findings from previous research by highlighting the role of leadership on institutionalization drawing on the example of VCA. Further, the study found acceptance and belief of leaders in the power of the respective management approach, i.e. VCA, as a relevant critical success factor for institutionalization. The implications for managers thus include developing and fostering an understanding and acceptance of the management approach by leaders. Findings lead to the practical implication for companies to recognize the attitude of leadership towards SEAR and involvement of management in change processes as well as dialogue and training of leaders.

This can lead to a change in leader’s mindset and influence leadership and cooperation within the company. In this way, an institutionalization of management accounting change can be supported by putting the respective SEAR approach "in place" within the company and thus supporting a corporate environment which acknowledges and follows the values connected to the particular SEAR approach.

5.4. Create an Understanding and Acceptance of Employees

In addition to the role of leaders, this dissertation found the role of employees to be particularly important in institutionalizing management accounting change through SEAR, i.e., VCA, and therefore influencing corporate values and decision-making. Results reveal that acceptance and understanding of VCA by employees are relevant critical success factor for an institutionalization. In order to support this attitude and mindset of employees, the dissertation found some helpful actions. For example, managers should encourage their employees to deal with VCA in order to understand the reasons and backgrounds of VCA and the change process. Then, a management accounting change, i.e. VCA, can become institutionalized within the company and leads to changes in corporate values and behavior.

5.5. Use Quantitative Sustainability Information

The choice of the type of data provided in SEAR may significantly influence the consideration of sustainability aspects in decision-making. This dissertation differentiates between three types of environmental information: qualitative, quantitative-physical, and quantitative-monetary environmental information. Providing quantitative-physical environmental information was found to be likely to support environmental issues in corporate decision-making processes. This dissertation thus concludes that providing environmental information in a quantitative-physical way gives environmental aspects, i.e. environmental performance, more importance in business decision-making and thus can influence decision-makers WTP in investment decisions.

Thereby, this dissertation further highlights a positive effect of sustainability reporting, as it requires companies to monitor, collect, and publish quantitative environmental and/or social information (Qian & Schaltegger, 2017). Studies show how the information used for external sustainability reporting on the same time is used for internal decision-making processes and thus integrates these quantitative environmental and/or social aspects in decision-making (Qian & Schaltegger, 2017). As this dissertation found a positive effect of quantitative environmental information on the recognition of sustainability in decision-making, providing quantitative environmental information in SEAR can influence the importance ascribed to sustainable aspects in corporate internal decision-making.

Overall, results how that it is important to deal with the type of environmental information provided in SEAR besides the provided content itself. The dissertation concludes to collect and provide quantitative-physical data for decision makers if possible in order to highlight sustainability aspects.

5.6. Consider Economic Impacts

The dissertation at hand reveals that besides the environmental and social aspects, economic pressures are important drivers as well as challenges for SEAR. The qualitative case study of VCA at Alnatura shows that, even if social issues and values are important for the company culture, economic aspects play a fundamental role in decision-making since it is the basis of economic activity. Additionally, the study on types of environmental information found that, even if monetization of environmental information may reduce the effects of environmental information on the WTP, financial performance of the respective investment is an important influence factor on the participant's WTP in all three scenarios.

Based on this results, this dissertation leads to the conclusion that in the field of sustainability management economic impacts play an important role in decision-making besides the sustainability issues and thus should be kept in mind when choosing and working with SEAR approaches. This finding does not lead to the implication to withhold or, contrary, to emphasize financial aspects in sustainability decision-making, but rather reveals the importance of dealing with financial aspects even in the context of sustainability management. While sustainability management is often limited to non-financial aspects, this findings supports the importance of discussing the effects of a connection between financial and non-financial aspects and their effects on (sustainability) decision-making.

5.7. Be Careful with Monetarization of Nature

Even if results show that economic aspects are relevant for sustainability decision-making, this dissertation supports a skeptical view on monetarization of sustainability factors. By investigating the influence of different types of environmental information (paper 2), this dissertation found that providing monetary-quantitative environmental information can reduce the recognition of environmental aspects in business decision-making and thus reduce the effects of environmental information on decision-makers WTP compared to providing non-monetary-quantitative environmental information.

Thus, if a company expects its decision-makers to emphasize environmental aspects in decision-making, this dissertation leads to the recommendation to provide the relevant environmental information in non-monetary terms. However, due to the importance of economic pressures and financial aspects described previously, this dissertation leads to the recommendation for future research to address the question how to connect monetary and non-monetary aspects in order to support sustainable business decision-making. Nevertheless, the use of monetary information in SEAR has to be done with caution, as it tends to cause decision-makers to react more rationally and economically.

The findings of this dissertation do not generally reject the use of quantitative-monetary environmental information, as the studies did not test for further possible effects of monetarization and did not investigate the provision of several different types of information. However, findings lead to the recommendation to be cautious when using monetary environmental information in decision-making and SEAR.

5.8. The Seven Criteria of SEAR in Light of Framing Theory

This dissertation follows the idea of framing theory and transports it into the field of SEAR. Results show that a 'framing' of decision situations in regard to SEAR, i.e.

language design and type of data provided, may affect corporate decision-making beyond the objectively equivalence of the decision situations. Nevertheless, this dissertation points out some further aspects and antecedents that need to be kept in mind, i.e. environmental orientation and the role of employees and leaders in change processes, as they may further affect decision-making processes in the field of SEAR beyond the framing effect itself. The previously worked out criteria two, five, six and seven relate to the 'framing' of the decision situation, i.e. language and type of data provided, while the criteria one, three and four relate to the influence of values, beliefs and mindset on the effect of framing and decision-making in the field of SEAR.

Overall, the dissertation at hand sheds light on the relationship between SEAR and business decision-making and finds seven criteria that need to be observed in order to better understand the connection between both phenomena and to support sustainability decision-making by companies.

6. Conclusion

6.1. Contributions to Research

The results gained are of scientific relevance in order to better understand the effects of SEAR on economic decision-making and its influencing factors. This dissertation investigates the influence of environmental orientation on the choice of SEAR, shows how the type and use of SEAR can influence decision-making, and points out some antecedents for institutionalizing management accounting change through use of SEAR, i.e. VCA.

Previous research uses institutional theory to analyze various factors that influence the use and extent of corporate sustainability reporting. As institutional theory mainly focuses on external factors, only a minority of previous studies investigates the influence of internal factors on sustainability reporting in light of institutional theory. However, in regard to sustainability reporting, internal factors, i.e. values or beliefs, may be particularly relevant as they are found to be important drivers in sustainability management. Having this research gap in mind, this dissertation shows how environmental orientation influences institutional processes beyond external factors. Thus, this dissertation highlights the need for modification of institutional theory to explain differences and similarities of sustainability reporting by environmental orientation as institutional theory neglects internal factors. Further, the results confirm the assumptions of previous studies that a company's environment as well as environmental orientation and the company's use of sustainability reporting are closely linked (e.g., Schaltegger, 2012).

Previous research discusses the influence of accounting and reporting as well as economically oriented SEAR on the perspective and role of sustainability issues in corporate decision-making (e.g., Cooper & Senkl, 2016; Hines, 1988, 1991). This dissertation supports a skeptical view on the influence of accounting and reporting on corporate decision-making regarding the recognition of sustainable aspects. This view can be partially confirmed by the findings of the studies, which highlight the influence of the type of SEAR, i.e., language and type of data provided, on economic decision-making regarding the recognition of sustainability issues. This dissertation reveals that the type of SEAR can influence decision-making beyond the content of SEAR itself. The findings are important as business decisions do not only have financial effects, but also have wider social and environmental implications. For example, an investment decision can have different effects on a company's carbon dioxide output and thus may influence society and environment besides the financial effects.

Further, this dissertation expands literature on the institutionalization of management accounting change by investigating antecedents for institutionalizing management accounting change through SEAR, i.e., VCA. As found in previous research, this investigation found internal antecedents for creating management accounting change in the three areas of organizational structure, organizational culture and leadership, and human resources. Besides the similarities to previous studies, some differences are found in the field of SEAR, i.e. VCA, in regard to the role of leadership and employees.

Finally, this dissertation transports framing theory into the field of SEAR and confirms the assumption of framing theorists that decisions are influenced by the way the specific decision situation is presented, i.e. the language used and the type of data provided. However, findings highlight that internal factors, i.e. the presented antecedents, further influence the framing effect in the field of SEAR besides the framing effect itself.

6.2. Contributions to Business Practice

Besides the theoretical relevance, this dissertation has practical relevance in terms of improving a company's SEAR and its influence on economic decision-making.

The first study shows that the choice of SEAR not only depends on strategic decisions but may be influenced by institutional pressures. As the choice of the type of SEAR can have far-reaching consequences for leadership, company culture and decision-making, management should be aware of the reasons behind its choice of SEAR, i.e. strategic reasons or institutional pressures.

Studies two and three show how the design of SEAR, i.e., the language used and the type of data provided, can have consequences for corporate decision-making and thus recommend practitioners to make choices about design and use of SEAR wisely and consider the far reaching effects of these choices on corporate decision-making.

Study four outlines some antecedents that managers need to address when using new approaches for decision-making in order to support a management accounting change in regard to sustainable decision-making.

Overall, this dissertation is based on the previous scientific and practical discussion about SEAR and corporate decision-making and combines it with empirical data. Besides scientific insights, the findings provide insights for business practice. A total of seven practical impressions for managers and politicians were worked out that are presented in the previous chapter.

6.3. Limitations and Outlook

While taking into account the scientific and practical implications of this dissertation, some limitations should be kept in mind and avoided in future research. Most notably, the context of the four single studies need to be kept in mind when interpreting the results. The sample of study two and three consist of students from German universities, which is not representative and may not be comparable with practical decision-making for example by accountants or managers. However, this approach is often chosen by researchers as the selected sample increases homogeneity of results. Further, as participants of the given studies were business students, it can be expected that they will hold similar positions and have to make similar decisions in the future.

All four studies are restricted to the German context and should therefore be used with caution when making international comparisons. Additionally, the sample of the fourth study is restricted to participants from the same company, with similar corporate background, values and processes. A comparison with other companies and different industries therefore has to be done with caution. Further limitations of the single papers are discussed in detail in the respective papers in appendix.

This dissertation's limitations provide potential research questions future research shall address. Further studies shall expand this research, which was mainly conducted in German companies and in the German language, and adapt it to international contexts to compare the results and make them adaptable for a wider audience. Additionally, further studies should compare the investigated VCA with its use in different companies with differences regarding environmental orientation. Moreover, these implications should be compared to the knowledge gained from the investigation of other SEAR approaches and tools. Finally, as the seven criteria were mostly derived from experimental data or questionnaires, they should be used and evaluated in practical situations.

This dissertation outlines the influence of different types of SEAR on corporate decision-making and the importance of a clear choice of SEAR. Furthermore, it shows that not only SEAR itself influences decision-making and environmental orientation within companies, but some antecedents are needed to successfully lead to a management accounting change and therefore influence decision-making. Now, the knowledge and implications are to be put into practice in order to support the further development of the current approaches of SEAR.

Table 5 briefly summarizes the research process of the dissertation as well as the key findings and contributions.

Table 3. Summary of research approach and main findings of the dissertation project

	Paper 1	**Paper 2**	**Paper 3**	**Paper4**
	Influence of environmental orientation on SEAR	Influence of type of SEAR on economic decision-making		Antecedents for SEAR
Gap	Little attention has been paid to internal drivers of SEAR, especially the role of environmental orientation, in previous studies. Also, there is a scientific and business debate about the influence of SEAR on its influence on (un-)sustainable behavior of companies. However, less empirical data has investigated these effects so far. Further, little knowledge is gained about antecedents of new SEAR approaches, i.e., VCA.			
Research Question	*How does the environmental orientation of companies influence their sustainability reporting?*	*How does the type of environmental information provided influence decision-making within companies?*	*How does the language used in accounting influence decision-making within companies?*	*What are the internal antecedents for social sustainability management?*
Results	Institutional pressures have less impact on Emerging Davids than on Greening Goliaths regarding the use of the guideline of the GRI for their sustainability report.	Presenting environmental information to decision-makers has the least impact on WTP when provided in a quantitative-monetary form, but the greatest impact when provided in quantitative-physical form.	A value-oriented accounting language, i.e. VCA, can reduce cost savings and increase the priority given to the negative social aspects of reducing staff costs.	Support of management and leadership, as well as acceptance of employees, are found to be relevant internal antecedents for supporting management accounting change in the case of VCA.
Contributions	The study found a strong link between framing of SEAR, internal aspects and values, and corporate decision-making. Findings lead to the development of seven criteria that managers should recognize when implementing SEAR. Additionally, findings lead to implication for theory, for example institutional theory, theory on management accounting change and the scientific debate about monetarization.			

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8. APPENDIX

8.1. Paper 1[1]

Sustainability Reporting as a Consequence of Environmental Orientation: A Comparison of Sustainability Reporting by German Emerging Davids and Greening Goliaths

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Abstract

Various studies investigate the design of corporate sustainability reporting in light of institutional theory. Whereas most of this literature examines the external factors that influence sustainability reporting, few studies focus on the internal drivers of sustainability reporting, especially the role of environmental orientation. This paper attempts to address this research gap by comparing companies with differences regarding environmental orientation. Therefore it distinguishes between companies that prioritise sustainability as business goals (Emerging Davids) and companies that use sustainability goals supplementary to their core business goals (Greening Goliaths). The paper finds differences in the sustainability reporting guidelines used by Emerging Davids and Greening Goliaths. Greening Goliaths are more likely to report according to the guidelines of the Global Reporting Initiative than Emerging Davids are. Thereby the study leads to the assumption that Greening Goliaths react more strongly to institutional pressures in terms of sustainability reporting than Emerging Davids do. This paper applies institutional theory in the context of environmental orientation and provides first insights into different institutional pressures within this field. While institutional pressures strongly influence the sustainability reporting of Greening Goliaths, they have less impact on the sustainability reporting of Emerging Davids.

1. Introduction

Over the last decades, companies are being increasingly pressured to publish information on influence of their activities on sustainable development (Herremans, Nazari, and Mahmoudian 2015; Onkila, Joensuu, and Koskela 2014). The growing customer and investor's interest in non-financial information can be attributed to the global financial

[1] The citation form is in accordance with the journals guidelines and may differ from the rest of the dissertation.

crisis of 2007, accounting and remuneration scandals, such as Enron's earnings restatement of November 8, 2001 (Grant and Visconti 2006) and an increasing awareness of the impact of businesses on sustainability issues, i.e. techniques and systems that produce emissions and waste (Dienes, Sassen and Fischer, 2016; Du Plessis and Brandon 2015; Dhaliwal, Tsang, and Yang 2011; Kolk 2008; Eccles and Krzus 2010; Baumgartner and Zielowski 2007). Through this development, companies have given greater consideration to sustainability over the last decades (Mani, Gunasekaran, and Delgado 2018; Christ and Burritt 2013) and voluntarily issued sustainability reports (Jeffrey and Perkins 2013; Lozano 2012; Dhaliwal, Tsang, and Yang 2011).

National and international regulatory approaches for sustainability reporting have also been increasing. For example, at the supranational level, the European Union enacted the so-called CSR directive in December 2014, which requires large capital market-oriented companies to publish non-financial information about the impact of their business activities on society and nature (Jackson et al. 2019; Johansen 2016; Maniora 2015).

Although a multitude of internationally recognised guidelines for voluntary non-financial reporting exist (Farooq and de Villiers 2019; Maniora 2015), numerous studies observed that sustainability reporting by many companies is becoming homogeneous (Higgins, Stubbs, and Milne 2018; Ali and Frynas 2018; Matten and Moon 2008). The tendency toward homogenisation of sustainability reporting by companies can be observed in the use of the same guidelines for sustainability reporting, i.e. the German Sustainability Code (GSC) and the Global Reporting Initiative (GRI), by many companies (Brown, de Jong, and Lessidrenska 2009). To explain the homogenisation of sustainability reports, many researchers analyse sustainability reporting on the background of institutional theory (e.g. Higgins, Stubbs, and Milne 2018; Ali and Frynas 2018; Rahaman, Lawrence, and Roperb 2004; Unerman and Bennett 2004). Institutional theory states that organisations are part of a social-economic-political system that leads them to specific decision (Attanayake Mudiyanselage 2018; Matten and Moon 2008). The application of institutional theory in the field of sustainability reporting aims to understand how companies react to changing institutional pressures within their reporting practices (Amran and Haniffa 2011).

However, most literature on the homogenisation of sustainability reporting discusses external drivers of sustainability reporting, e.g. national conditions (see Ali, Frynas, and Mahmood 2017; Patten, Ren, and Zhao 2015; Maignan and Ralston 2002), and the industry in which a company operates (see Nurhayati et al. 2016; Campbell, Craven, and Shrives 2003; Roberts 1992). Little attention is paid to the internal drivers of sustainability reporting such as organisational values and beliefs. In the field of sustainability management, some studies already focus on the connection of the sustainable behaviour of companies and their environmental orientation (e.g. Schaltegger, Bennett, and Burritt 2006). In this context, Hockerts and Wüstenhagen (2010) differentiate Emerging Davids, i.e. companies which have environmental and social performance goals as a core business goal, from Greening Goliaths, i.e. companies which use sustainability goals supplementary to their core business or as a trustee duty.

This paper attempts to apply this distinction to analyse how sustainability reports differ between companies with different environmental orientations under the perspective of institutional theory. Therefore it is assumed that there is a connection between sustainability reporting, as the output of institutional pressures, and environmental orientation. The results of this study provide a first insight into the similarities and differences of the sustainability reporting of Emerging Davids and Greening Goliaths. Thereby it leads to theoretical implications regarding a modification of institutional theory by the impact of internal factors. Further, it leads to practical implications for organisations and governments regarding influences on the outcome of sustainability reporting practices by companies with different environmental orientation.

In the first part of this paper, a literature review of studies that examine the homogenisation of sustainability reporting is presented. Next, the theoretical framework of the given study is developed and two research hypotheses are derived. In the third part of the paper, the methodology of the study is described. The next part presents and discusses the main findings. The limitations of this study and implications for further research are addressed in the end of this paper.

2. Literature review

This paper is based on the idea that corporate environmental orientation may influence the extent of sustainability reporting. Therefore this section examines previous literature on sustainability reporting and corporate environmental orientation. After that, the theoretical framework of this study is presented, which is built on institutional theory, and hypotheses are developed.

2.1. Sustainability reporting[1] as strategic tool

Schaltegger, Bennett, and Burritt (2006) show how sustainability reporting and corporate strategy are linked and that sustainability reporting can be used as a strategic tool, depending on a company's environment and strategic aims. There are different strategic reasons for companies to publish sustainability reports. A broadly scientific discussion is about using sustainability reporting, on the one hand, as a tool for internal and external communication 'to gain, maintain or repair their legitimacy' (Parsa et al. 2018, 50; Campbell, Craven, and Shrives 2003). On the other hand, sustainability reporting can be used as a feedback tool to support internal decision making and to improve a company's sustainability outcomes (Hedberg and Malmborg 2003).

Previous empirical research addressed external factors that influence sustainability reporting in many fields. Firstly, studies have identified significant differences and similarities in sustainability reporting based on national conditions (e.g. Gomez-Gutierrez and Cormier 2018; Chersan 2016; Patten, Ren, and Zhao 2015; Waddock 2008). For example, Chersan (2016) found that companies which operate in OECD member countries are more likely to report according to GRI and Jensen and Berg (2011) show that companies publishing integrated reports differ from companies publishing traditional sustainability reports with regard to several country-level determinants.

Secondly, other studies have highlighted variations of sustainability reporting within the particular industry in which a company operates. Kolk (2005) points out that industry sector is the most important determinant for explaining sustainability reporting of international companies. Many other empirical studies confirmed this assumption by comparing the sustainability reporting of different industries (e.g. Nurhayati et al. 2016; Campbell, Craven, and Shrives 2003; Roberts 1992). Roberts (1992) analysed effects of industry membership by differentiating industries into two groups depending on consumer visibility, political risk, and intensity of competition. He found organisations with 'consumer visibility, a high level of political risk, and concentrated, intense competition' to be more likely to publish information about their influence on sustainability (Roberts 1992, 605). Referring to guidelines for sustainability reports, Chersan (2016) noticed that GRI guidelines were used more frequently by companies that operate in sectors with high environmental risk and high visibility in the capital market.

Thirdly, initial studies have highlighted the influence of type of the business entity as well as company size on the extent of sustainability reporting (Comyns 2018; Palma, Lourenço, and Branco 2017; Chersan 2016; Dienes, Sassen, and Fischer 2016). Stawinoga and Velte (2015), for example, found that German stock companies, i.e. listed companies, on the one hand apply the German Sustainability Code for sustainability reporting differently than German public enterprises, medium-sized as well as family-owned businesses on the other hand. Chersan (2016) found that large and multinational companies are more likely to report according to GRI and Levy, Brown, and de Jong (2010) show that, in contrast, small and medium size companies are less likely to report according to GRI.

Relatively little prior work has paid attention to the influence of internal factors, such as the company's environmental orientation on sustainability reporting (Searcy 2012). As one of the few exceptions, Adams (2002) shows how internal factors influence the extent of a company's sustainability reporting. These influential internal factors 'include aspects of the reporting process and attitudes to reporting, its impacts, legislation and audit' (Adams 2002, 244). Additionally, investigating companies in highpolluting industries, Nazari, Herremans, and Warsame (2015) examine the influence of external pressures and internal control factors that support corporate sustainability reporting. They found that these variables are related to enhanced sustainability reporting, that is 'using a GRI externally assured report as the upper level standard' (Nazari, Herremans, and Warsame

2015, 386–387). Pérez–López, Moreno–Romero, and Barkemeyer (2013) highlight the diversity of internal factors influencing the adoption of sustainability reporting. These factors can be internal processes, i.e. stakeholder involvement and corporate structures, and internal attitudes, i.e. corporate culture and values (Kolk 2010; Adams 2002).

Schaltegger, Bennett, and Burritt (2006) propose a framework to position different kinds of corporate environmental orientation and provide reference for different approaches of sustainability reporting to each category. They conclude that, dependently of the expectations of the business environment and a company's environmental orientation, aims and usage of sustainability reporting may differ.

The given study expands previous research by providing first insights into the link between environmental orientation and sustainability reporting. Thereby it answers the call from Adams (2002) to research more corporate characteristics that may influence sustainability reporting. In this way, it may be possible to better predict reporting behaviour of different types of companies (Adams 2002).

2.2. Sustainability reporting and environmental orientation

Corporate environmental orientation refers to the internal attitude of a company towards the effects of its business activities on environmental problems such as climate change and the need to minimise these effects (Banerjee 2002). It can be understood as a 'corporate value, akin to corporate social responsibility' (Banerjee 2002, 182) and involves corporate values regarding the importance of the environment and external stakeholders. To categorise companies with regard to their environmental orientation, Hockerts and Wüstenhagen (2010) distinguish 'Emerging Davids' and 'Greening Goliaths'. They define Emerging Davids as sustainability-oriented companies 'often run by idealists' (p.487). One key characteristic of Emerging Davids is the importance of a value-based approach for their business concept and their 'intention to effect social and environmental change in society' through their business activities (Hockerts and Wüstenhagen 2010, 487). Yet they do not necessarily have to be social enterprises. Emerging Davids want to realise economic success with environmental products and services (Rahman and Yadlapalli 2015). They are 'supported by idealistic stakeholders strongly committed to the sustainability mission' (Hockerts and Wüstenhagen 2010, 487).

The second type of companies is the Greening Goliaths. Sustainability does not take an important role in their business strategy. Greening Goliaths have a reactive approach towards sustainability (Rahman and Yadlapalli 2015). They start taking care of sustainability issues because of market demand, e.g. 'by adopting sustainability communication and management systems in an attempt to better understand the issues they are facing as well as to demonstrate to stakeholders that they are sincere about their concerns' (487) or because they see opportunities in new markets (Hockerts and Wüstenhagen 2010). Thus, they have to integrate sustainability issues into their corporate strategy and activities. While Hockerts and Wüstenhagen (2010)'s definition of Greening Goliaths and Emerging Davids has been picked up broadly in the sustainability management literature (e.g. Shrivastava and Tamvada 2017; Rahman and Yadlapalli 2015; Hockerts and Wüstenhagen 2012; Kotzab et al. 2011), it has not yet been applied to issues related to sustainability reporting.

Both types of companies, Emerging Davids and Greening Goliaths, use sustainability management methods and tools, such as sustainability reporting. However, the reason for use might differ. Emerging Davids, on the one side, do sustainability activities, because it is part of their business strategy and internal beliefs (Kotzab et al. 2011). On the other side, Greening Goliaths implement environmental aspects into their business after time because of external pressures (Hockerts and Wüstenhagen 2010). This is why the question is interesting, if the different environmental orientation leads to differences in a company's sustainability reporting. In detail, Greening Goliaths are defined as companies that produce conventional products or services and business-as-usual practices. After time, Greening Goliaths might also implement sustainable practices, i.e. sustainability reporting, because of different external pressures (Hockerts and Wüstenhagen 2010). For example, in this study the German food company 'Harry Brot' is classified as Greening Goliath as it mainly produces conventional bakery products, but also published a sustainability report and undertakes several activities to become more sustainable (Harry-Brot 2019). In contrast, Emerging Davids mainly produce ecological products or services as sustainability is part of their business strategy. For example, this study classifies the German wholesaler of organic food 'Alnatura' as Emerging David, as sustainability is part of its business strategy and the whole products of the company are eco-labelled since the founding of the company (Alnatura 2018).

Greening Goliaths as well as Emerging Davids are assumed to do sustainability activities, i.e. publish sustainability reports, even if the reasons behind these activities may differ. This is why the given study does not compare whether a company publishes a sustainability report or not, but compares the extent of the report itself.

2.3. Theoretical framework

To address external and internal factors that influence sustainability reporting, this study uses institutional theory because it analyses how organisations react to changing institutional pressures in their sustainability reporting to maintain 'legitimacy gained by acceding to societal norms' (Haunschild and Chandler 2008, 624; Amran and Haniffa 2011). After time, companies become more similar to each other, e.g. by modelling practices by organisations that are perceived as more successful. This process is called 'homogenization'. DiMaggio and Powell (1983) describe the homogenisation of organisations as an output of institutional practices within organisations, which they call 'isomorphism' (Amran and Haniffa 2011). Isomorphism arises from the need of organisations to respond to environmental expectations and develops clusters of organisations. The so-called 'organizational fields' consist of organisations who communicate and interact frequently with each other (Machado-da-Silva, Guarido Filho, and Rossoni 2006). Within these organisational fields institutional pressures can become more important in decision making than for example efficiency gains or strategies (Neugebauer 2012). In the case of sustainability reporting, the reporting of companies within an organisational field becomes more similar after time, because they are influenced by the same isomorphic forces (Matten and Moon 2008).

DiMaggio and Powell (1983) define three antecedents that lead to isomorphic change and Amran and Haniffa (2011) put them into the context of sustainability reporting. The first isomorphic process is coercive isomorphism, which considers the political environment as an influence on corporate decisions (Neugebauer 2012; Amran and Haniffa 2011). Its sources include governmental regulations, as for example the CSR directive of the European Union (Higgins and Larrinaga 2014) and may explain differences and similarities in sustainability reporting based on national conditions as investigated by Chersan (2016) and Jensen and Berg (2011). Secondly, uncertainty about the development of markets or the effects of entrepreneurial practices will lead an organisation to copy practices of other organisations that are perceived as more legitimate (Amran and Haniffa 2011; Walgenbach 2002), which is called mimetic isomorphism. Therefore, organisations may follow the sustainability reporting practices of other organisations, i.e. within the same industry as investigated by Kolk (2005), to secure legitimacy and their market position (Unerman and Bennett 2004). Thirdly, normative isomorphism describes 'pressures arising from group norms to adopt particular institutional practices or to fulfil professional expectation' (Amran and Haniffa 2011, 143). Therefore, the output of sustainability reporting may be affected by the educational and professional background of employees (Higgins and Larrinaga 2014). The described institutionalisation processes cause organisations within an organisational field to become similar to each other when they are reacting to external expectations (Higgins and Larrinaga 2014; Deegan and Unerman 2006).

2.4. Sustainability reporting as research object of institutional theory

In the context of this study, the outcome of institutionalisation is sustainability reporting. The given study assumes that institutional pressures that influence the extent of sustainability reporting, i.e. the use of GRI and the provision of third-party assurance statements, might be influenced by a company's environmental orientation besides the organisational field.

As stated above, only a few of the existing studies deal with the influence of environmental orientation on the homogenisation of sustainability reporting. On the basis of current research, this study assumes a connection between environmental orientation and institutional pressures on sustainability reporting. Using institutional theory, earlier research stressed that organisations do not appear to base their decisions around sustainability reporting on rational choices, e.g. to publish the reporting that support sustainable decision making in the company the best, but to meet institutional expectations (Bebbington, Higgins, and Frame 2009). These institutionalisation processes cause the sustainability reports of companies within an organisational field to become more similar to each other (Higgins and Larrinaga 2014; Deegan and Unerman 2006).

While the sustainability activities of Greening Goliaths are strongly affected by various institutional pressures, e.g. market pressures from competitors and governmental pressures (Spence, Boubaker Gherib, and Biwolé 2011), many studies identify the ability to resist these pressures as a key success factor of Emerging Davids (Raudeliūnienė, Tvaronavičienė, and Dzemyda 2014; Kirkwood and Walton 2010). Marshall, Cordano, and Silverman (2005) conclude that individual attitudes, such as 'a strong presence of environmentally oriented attitudes and organizational norms' (p.98), are necessary drivers for ecopreneurship and therefore for Emerging Davids. Pastakia (2002) highlights that even if external forces, i.e. market demand, are needed to develop ecopreneurship, internal forces, i.e. sustainability values, are considered superior and more liable to 'lead to ecopreneurship of the highest order' (p.97).

Sustainability reporting can positively influence a company's sustainability outcomes (Hedberg and Malmborg 2003), and improving these outcomes is one of the main aims of Emerging Davids (Hockerts and Wüstenhagen 2010). Thus, it can be assumed that the sustainability reporting by Emerging Davids is a result of internal strategic decision making. Given that the sustainability activities of Greening Goliaths are strongly influenced by different external pressures (Spence, Boubaker Gherib, and Biwolé 2011), it can be assumed that the sustainability reporting of Greening Goliaths is highly influenced by institutional pressures.

2.5. Sustainability reporting guidelines

Isomorphic pressures are studied in-depth in the field of sustainability reporting (Higgins, Stubbs, and Milne 2018; Dash and Mishra 2017; Fortanier, Kolk, and Pinkse 2011). The tendency towards homogenisation of sustainability reporting is increased by the globalisation of organisational structures and the rising importance of sustainability development (Dash and Mishra 2017). This can be observed in the use of the same sustainability reporting guidelines, such as the GRI, by companies around the world (Brown, de Jong, and Lessidrenska 2009). Although using these guidelines is basically voluntary, companies increasingly adopt them (Eccles and Saltzman 2011; Vigneau, Humphreys, and Moon 2015) to enhance comparability and transparency of their sustainability reports (Einwiller, Ruppel, and Schnauber 2016; Eccles and Saltzman 2011).

Over the past decades, the number of guidelines concerning corporate social responsibility and sustainability reporting has increased considerably (Chersan 2016; Ligteringen and Zadek 2004). Besides a multitude of (inter-) national recognised guidelines[2], there are also local/national initiatives like the German 'Economy for the Common Good'[3] (ECG; German 'Gemeinwohlökonomie'). Within this multitude of guidelines, certain researchers consider GRI the most frequently used guideline in sustainability reporting (del Mar Alonso–Almeida, Llach, and Marimon 2014). For example, KPMG (2015) found that threefourth of the largest 250 companies worldwide have adopted the GRI guideline. Additionally, 60 per cent of the 3,267 companies surveyed in their study reported using the GRI guidelines (KPMG 2015).

GRI developed a generally accepted guideline for sustainability reports (Brown, de Jong, and Lessidrenska 2009). Studies found that a relevant reason for adopting GRI is 'the desire to gain the market's trust' (Chersan 2016, 427). Brown, de Jong, and Lessidrenska (2009) show that the increasing use of GRI may be a sign for a 'certain institutional logic' that has formed for GRI (Brown, de Jong, and Lessidrenska 2009, 578). In this, GRI is mainly used for 'sustainability, reputation, and brand management' (Brown, de Jong, and Lessidrenska 2009, 578). Additionally, studies support the relevance of recognised guidelines for sustainability reporting, i.e. GRI, for investor's judgement (Berthelot, Coulmont, and Serret 2012). Studies further showed how companies may use sustainability reporting to communicate their positive contributions to sustainability (Boiral 2013).

Greening Goliaths, on the one side, engage in sustainability activities such as sustainability reporting because they seek market's trust (Hockerts and Wüstenhagen 2010) and thus may use the most accepted guideline for their sustainability reporting. Emerging Davids, on the other side, do sustainability activities, i.e. sustainability reporting, to improve their sustainability performance, since it is their business goal (Hockerts and Wüstenhagen 2010). This is why it is assumed that Emerging Davids do not choose the guideline that is most accepted but choose the guideline that fits the best to the company and its strategic aims. Emerging Davids are thus more likely to choose guidelines other than the most commonly used guideline as isomorphic pressure might be lower (cf. DiMaggio and Powell 1983). However, this conclusion does not imply that Emerging Davids would not use GRI, because the choice of GRI can go back to institutional pressures, but also to internal decisions within the company.

Assuming that Greening Goliaths react more strongly than Emerging Davids due to institutional pressure with regard to sustainability issues and that the wide use of the GRI indicates their institutional power, this study presents the following hypothesis:

Hypothesis 1: Greening Goliaths use the guidelines of the GRI for their sustainability reports more often than Emerging Davids.

The GRI reporting framework recommends a third-party assurance of sustainability reports (Perego and Kolk 2012). By providing a third-party assurance, companies use expertise of external actors to confirm the compliance with the used guidelines requirements or the correctness of the reported information to the company's stakeholders (Owen and O'Dwyer 2004). The findings of the assurance provider 'are laid down in a verification statement' (p.174) that can be included into the sustainability report (Perego and Kolk 2012). Perego and Kolk (2012) assume that companies voluntarily provide a third-party assurance statement, because of the 'need for enhanced credibility of sustainability reporting to both internal (e.g. management and employees) and external (e.g. stakeholders) audiences' (175).

Also, Kolk et al. (2002) show that that the increasing number of companies providing third-party assurance statements for their sustainability reporting comes from 'the demand for reliable and credible information from management (…) and from stakeholders' (p.18; cited by Kolk and Perego 2010). Additionally, Velte and Stawinoga (2017) show how companies provide third-party assurance statements to their sustainability reporting in order 'to improve its credibility' (p.1018). Perego and Kolk (2012) show how external institutional pressures drive the adoption of assurance statements for sustainability reports. They explore how multinational companies provide assurance statements 'to develop and sustain organisational accountability for sustainability' (Perego and Kolk 2012, 1).

Assuming that Greening Goliaths react more strongly to institutional pressure in terms of sustainability reporting than Emerging Davids and that the adaption of third-party assurance for sustainability reports is influenced by institutional pressures, this study presents the following hypothesis:

Hypothesis 2: Greening Goliaths provide third-party assurance statements for their sustainability reports more often than Emerging Davids.

3. Research methodology

This study examines sustainability reports by German companies, including Emerging Davids as well as Greening Goliaths. Previous literature often uses qualitative interviews or content analysis of given publications to identify Emerging Davids and Greening Goliaths (e.g. Rahman and Yadlapalli 2015). However, as eco-labelling is important to 'assure the consumer that the producer has complied with published, transparent, environmentally friendly standards' (Van Amstel, Driessen, and Glasbergen 2008, 243) and eco-labeled products 'can play a key role in the achievement of sustainable development goals' (Dangelico 2017, 1144), the given study uses whether or not more than 75% of products or services of a company are eco-labelled as the main selection criterion for each category.

For this, companies that offer eco-labelled products or services and produce a sustainability report are classified as Emerging Davids. Companies with a conventional product portfolio that also publish sustainability reports, were classified as Greening Goliaths. Unlike Hockerts and Wüstenhagen (2010), this study does not use company size and age as the main characteristics that differentiate Emerging Davids and Greening Goliaths. This change of Hockerts and Wüstenhagen (2010)'s distinction has been used in the literature before as it is argued that change on mass market is needed for sustainable development of global industries (Ball and Kittler 2019; Schaltegger, Lüdeke-Freund, and Hansen 2016; Schaltegger 2002).

Instead, studies primarily look at the environmental orientation of companies and the priority of sustainability as business goals to differentiate Emerging Davids and Greening Goliaths (e.g. Ball and Kittler 2019). The given study thus defines companies that treat sustainable issues as central to their core business as Emerging Davids, regardless of their company size or age. Table 1 provides an overview of the characteristics of Emerging Davids and Greening Goliaths.

Table 1. Comparison of Emerging Davids and Greening Goliaths

Emerging David	Greening Goliath
Active approach towards sustainability (Hockerts and Wüstenhagen 2010)	Reactive approach towards sustainability (Rahman and Yadlapalli 2015)
Value-based approach for their business concept (Hockerts and Wüstenhagen 2010)	Stakeholder-driven approach for their business concept (Hockerts and Wüstenhagen 2010)
Intention to effect sustainable change in society through their business activities (Hockerts and Wüstenhagen 2010)	Intention to demonstrate to their stakeholders that they are sincere to their concerns (Hockerts and Wüstenhagen 2010)
Do sustainable activities because sustainability is part of their business strategy (Kotzab et al. 2011)	Do sustainability activities because of external pressures or market opportunities (Hockerts and Wüstenhagen 2010)

The sample consists of 74 companies from Germany that were matched for corporate characteristics in terms of company size (number of employees), industry membership, and service/product portfolio to make sure that data is comparable (Buhr and Freedman 2001). The examined sustainability reports were published between 2011 and 2018. The CSR Directive of the European Parliament requires 'large capital market-oriented companies, credit institutions, financial services institutions and insurance companies' to expand their financial reporting by providing a sustainability report (Feldmann and Leuchters 2019, 6). However, since this directive only affects certain companies, all collected reports in this study were published without legal obligation (see the list created by Kluge and Sick 2016). The descriptive statistics of the final dataset are displayed in Table 2.

The sustainability reports were examined for the guidelines they follow and for whether they included third-party assurance statements. Information about company size, industry membership, number of published reports, and year of publication was collected. Company size was measured by the number of employees, following previous studies (Chen, Lee, and Ahlstrom 2019).

Table 2. Descriptive characteristics of the dataset.

Characteristics	**Result**			
Number of companies	74			
Number of 'Emerging Davids'	37			
Number of 'Greening Goliaths'	37			
Category				
Production	50			
Service	24			
	Min	**Max**	**Mean**	**SD**
SIZ (number of employees)	7	9000	1102	1779.51
YEAR (Year of publication)	2011	2018	2015	1.63
NUMB (Number of published reports)	1	9	2.24	1.94

As described above, this study uses the classification of environmental orientation by Hockerts and Wüstenhagen (2010), with the exception that company size and age were not used as characteristics for type of environmental orientation following previous broad studies (e.g. Ball and Kittler 2019). The coders differentiated the companies between Emerging Davids and Greening Goliaths depending on the certification of their product (or service) portfolio according to eco-labels. Companies that have a sustainability certification for their product portfolio were selected as Emerging Davids, whereas companies with a conventional product portfolio that also publish sustainability reports were selected as Greening Goliaths. Eco-labels are defined as certifications that ensure that the products (or services) offered by the company have been produced under particularly environmentally friendly and/or socially compatible conditions. This study includes both, eco-labels verified by a third-party as well as eco-labels 'that the producers own themselves and use to guarantee their own environmentally friendly behaviour' (Van Amstel, Driessen, and Glasbergen 2008, 265). Eco-labelling as selection criterion was used to enable an objective distinction between different companies and to prevent the influence of marketing on the sustainability image of the company.

The data was coded by a team of one author of the paper as lead researcher and one independent coder following previous studies (cf. Perego and Kolk 2012). After viewing public company data, e.g. information on the company's website and media reports, the companies were divided into Emerging Davids and Greening Goliaths. As mentioned before, the main distinction criterion was the product or service portfolio of the companies. The calculation of Krippendorff's alpha (r = .94) confirms the high intercoder reliability of the construct (cf. Krippendorff 2004).

In the analysis, a binary logistic regression model was estimated. The independent variable was derived from the coding according to environmental orientation mentioned above. This information was used to distinguish companies that are marked as Emerging Davids [ENV = 1] from companies marked as Greening Goliaths [ENV = 0]. Further studies highlighted the influence of industry membership on sustainability reporting (e.g. Kolk 2005; Chersan 2016); thus, industrial sector (divided into service and production) was set up as a control variable. Appendix 1 provides a full list of the specific industrial sectors.

Previous research demonstrates the influence of company size on institutional pressures of sustainability reporting (e.g. Levy, Brown, and de Jong 2010). However, company size was not included as a further control variable in the analysis, because a correlation (significance level: 0.01) was found between company size and environmental orientation in the collected data. Since Nazari, Herremans, and Warsame (2015) show that companies are improving and expanding their reporting over time, the number of published reports as well as year of publication is used as an additional control variable.

Independent variables should be free of multicollinearity. Thus, the variance inflation factors (VIF) was measured based on linear regression (Midi, Sarkar, and Rana 2010). Following previous studies, multicollinearity was indicated with a VIF of above two (Krause and Battenfeld 2017). The multicollinearity test with the final variable set showed that it is not affected by multicollinearity. The following section will display the results of the analysis.

4. Findings

As a first step of analysis, environmental orientation of companies was compared descriptively with regard to the chosen guideline. Table 3 highlights that the majority of Greening Goliaths (56.76%) use the guidelines of GRI for their sustainability report. A total of 35.14% of the Greening Goliaths do not use any guideline, and 8.11% choose other guidelines. By contrast, 32.43% of Emerging Davids use the guidelines of GRI, 45.95% of Emerging Davids do not use any guideline, and 21.62% choose another guideline. While 13.51% of the Emerging Davids use the alternative guideline of ECG, no Greening Goliath uses this guideline.

Table 3. Chosen guideline by environmental orientation.

	Result			
Chosen Guideline	Emerging Davids		Greening Goliaths	
GSC	3	8.1%	3	8.1%
GRI	12	32.4%	21	56.8%
ECG	5	13.5%	0	0%
None	17	46.0%	13	35.1%
Sum	37	100%	37	100%

To test the first hypothesis, binary logistic regression (model 1) described in the previous section was used (Table 4). For this purpose, the variable of whether a company chose the guideline of GRI for their sustainability report or not was used as the dependent variable. The analysis examines which factors affect the likelihood of using the GRI guidelines for the sustainability report. As can be seen from the test of likelihood ratio quotients, the industry dummy has no significant influence on the use of GRI. By contrast, the environmental orientation of a company influences the decision for or against GRI significantly ($p = .012$). The number of the reports provided and the year of publication also shows a significant influence (significance level: .05).

Table 4. Binary logistic regression.

			Model 1	Model 2	
Summary	Dependent variable		GRI	Assurance	
	N		74	74	
	Pseudo R^2 (Nagelkerke)		.213	.092	
	Significance of the model		.012	.276	
	VIF_{max}		1.136	1.136	
Test of likelihood quotients	**Independent variable**		**Chi^2**	**Chi^2**	
	ENV (environmental orientation)		6.276**	.023	
	NUMB (number of reports)		5.243**	.344	
	YEAR (Year of publication)		4.454**	3.632*	
	IND (industry category)		.10	.284	
Parametric rating	**Independent variable**	**B**	**Exp (B)**	**B**	**Exp (B)**
	Constant term	-667.434	.000**	639.163	9.844E+277
	ENV (environmental orientation)	-1.294	.274**	-.077	.926
	NUMB (number of reports)	-.319	.727**	-.077	.926
	YEAR (Year of publication)	.333	.395**	-.316	.729*
	IND (industry category)	.058	1.060	-.295	.745

**Significance level: .05
*Significance lever: .1

Analysing the parameter estimates can support the findings. The significant regression coefficient for company’s environmental orientation (significance level: .05) reveals that, as expected, Greening Goliaths are more likely to report according to the guidelines of GRI than Emerging Davids (−1.294*). This finding means that the odds of reporting according to GRI are 73% smaller for Emerging Davids than for Greening Goliaths (Exp [B] = .274). Hypothesis 1, that Greening Goliaths use the guidelines of the GRI for their sustainability reports more often than Emerging Davids, can be confirmed. For the industry dummy, the regression coefficient is not significant. The number of the reports provided and the year of publication also have a significant influence on whether a company’s sustainability report follows GRI or not (significance level: .05).

To elaborate the second hypothesis, environmental orientation of companies was compared descriptively with regard to providing third-party assurance. A total of 35.14% (n = 26) of the investigated companies provide third-party assurance statements.

The descriptive results in Figure 1 show that 35.14% (n = 13) of Greening Goliaths and also 35.14% (n = 13) of Emerging Davids provide third-party assurance statements in their sustainability reports. There was no striking difference in the type and content of the assurance statements, e.g. related to assurance provider or assurance's scope.

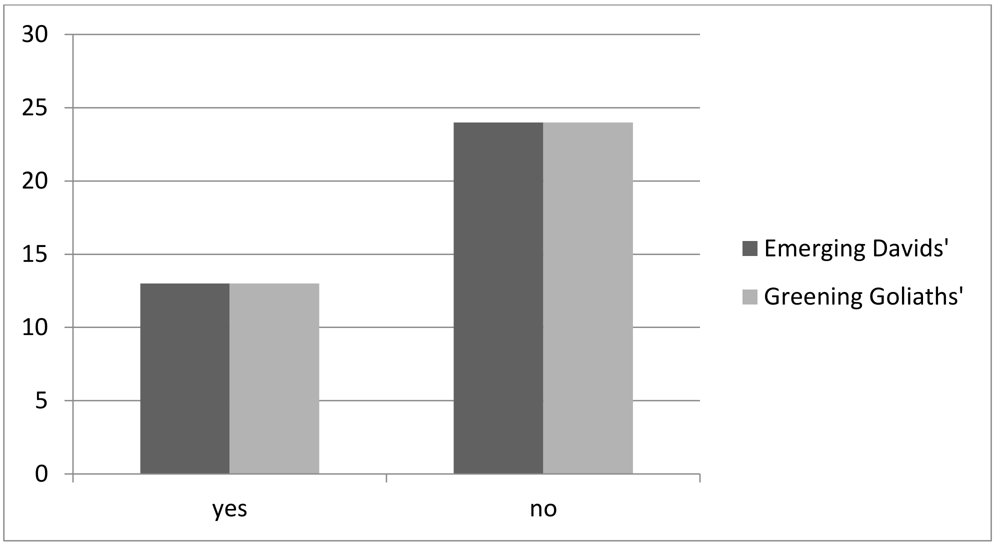

Figure 1. Third-party assurance statement by environmental orientation.

To test for possible influencing factors on providing third-party assurance statements for sustainability reports, binary logistic regression (model 2) was used (Table 4). For this analysis, the variable of whether a company provides third-party assurance statements in their sustainability report or not was used as the dependent variable. Both the test of likelihood ratio quotients and the analysis of the parameter estimates showed only a significant influence for the year of publication. Thus, Hypothesis 2, that Greening Goliaths provide a third-party assurance statement for their sustainability reports more often than Emerging Davids, cannot be confirmed.

5. Discussion and conclusions

Previous research analysed a number of institutional effects on sustainability reporting. While external factors, e.g. industry (e.g. Campbell, Craven, and Shrives 2003) and national origin (e.g. Kolk 2005), have been studied intensively, little attention has been paid to internal factors that influence the isomorphism of sustainability reporting, especially environmental orientation. The present study extends and complements prior research by analysing the effects of environmental orientation on sustainability reporting. To this end, the sustainability reporting by Emerging Davids and Greening Goliaths is examined. The collected data is compared in relation to the choice of the GRI guidelines and whether the company provides a third-party assurance statement.

Results reveal that institutional effects on sustainability reporting differ in regards to a company`s environmental orientation. Therefore, the findings confirm expectations from earlier scholars (e.g. Schaltegger 2016) that environmental orientation and sustainability reporting are closely linked. The analysis shows that the environmental orientation of a company has a significant influence on whether the company chooses the GRI as a guideline for their sustainability report or not beyond external factors. Greening Goliaths were more likely to report according to the GRI guideline in their sustainability reporting than Emerging Davids. Increased homogenisation of the use of GRI for sustainability reports of many organisations is a result of institutional pressure (Brown, de Jong, and Lessidrenska 2009). Thus, the findings of this study suggest that Greening Goliaths are exposed to stronger institutional pressure on sustainability reporting, in particular the chosen guideline, than Emerging Davids. Therefore sustainability reporting appears to be the institutionalised output for Greening Goliaths, but not for Emerging Davids. While Emerging Davids were less likely to choose the GRI guideline for their sustainability report, the present study is consistent with the study of Pastakia (2002), who highlights that even if several external factors influence the sustainable behaviour of Emerging Davids, individual factors, such as attitudes and values inside the organisation, are considered superior.

While there was a significant influence of environmental orientation on whether a company followed the guideline of GRI, environmental orientation showed no significant influence on whether a company followed any other guideline or no guideline. This leads to the assumption that Emerging Davids do not choose the guidelines for sustainability reporting based on institutional pressure, but are able to more deliberately choose alternative guidelines, i.e. ECG, as well. An interesting finding is that there is a number of Emerging Davids (46%) as well as Greening Goliaths (35.1%) that do not use any guideline for their sustainability reporting. This might lead to the assumption that the investigated German companies were less likely to be influenced by institutional pressures in regard to the chosen guideline. However, this was not part of the research question of the given study and should be addressed by future research.

This study could not confirm Hypothesis 2, which stated that Greening Goliaths provide third-party assurance statements more often than Emerging Davids. The logistic regression showed no significant influence of environmental orientation on whether a company provides external assurance statement for their sustainability report or not. Data quality continues to be a significant issue for sustainability reports (Kolk et al. 2002); thus, a possible explanation for Hypothesis 2 not being confirmed is that companies provide third-party assurance statements for their sustainability reports not only to react to institutional pressures. Instead, companies may provide third-party assurance statements for their sustainability reporting to reduce data quality risks and seek external knowhow to improve their reporting (GRI 2013) or to build their corporate reputation

(Simnett, Vanstraelen, and Chua 2007). This idea might be a possible explanation for why companies provide a third-party assurance statement for their sustainability reports beyond isomorphic pressures and explains why the environmental orientation of a company has no significant influence on providing third-party assurance statements for the sustainability report in this study.

Previous studies point out different driving forces behind sustainability reporting for groups of companies with different environmental orientation (cf. Burritt and Schaltegger 2010; Schaltegger, Bennett, and Burritt 2006). The sustainability reporting of Emerging Davids is strongly linked to the company’s strategic goals concerning environmental management and orientation. By contrast, Greening Goliaths depend on the expectations and requirements of their stakeholders. Thus, they derive their sustainability reporting approaches from their stakeholders.

This idea leads to the assumption that, depending on environmental orientation, companies react differently to external pressures when creating their sustainability reporting and accounting (Burritt and Schaltegger 2010). As a result, different challenges are presented that Emerging Davids and Greening Goliaths have to deal with in their sustainability management. The present paper has shown that institutional theory cannot completely explain the development of sustainability reporting in relation to environmental orientation because it found differences in sustainability reporting depending on environmental orientation.

Institutional theory places external factors, such as industry and company size, in the foreground of their analysis and pays little attention to internal, strategic factors. However, especially in the field of sustainability management, internal attitudes and values are considered important factors that influence decision making (Pastakia 2002). With this research gap in mind, this study showed how environmental orientation influences sustainability reporting beyond institutional pressures. However, institutional theory does not pay enough attention to sustainability orientation and needs to be modified to explain differences and similarities of sustainability reporting by Emerging Davids and Greening Goliaths.

This study identified environmental orientation as one driver of sustainability reporting (i.e. use of GRI) and thus, results may help to predict and encourage reporting behaviour (Adams 2002). Findings illustrate that environmental orientation of companies influences corporate sustainability reporting practices in regard to the use of GRI. This results lead to practical implications for organisations and governments. To influence the sustainability activities of Greening Goliaths, external pressures and demand need to be changed. If new external pressures on a company’s sustainability reporting arise, then Greening Goliaths might react to those pressures by changing their sustainability reporting. By contrast, a change of external pressures will not necessarily change the sustainability activities of Emerging Davids. Instead, a necessary step is to explain to an Emerging David why a change in their sustainability activities makes sense for sustainable development and to induce them to change this activity from within.

Several studies analysed sustainability activities in relation to environmental orientation. However, little attention has been paid to companies' sustainability orientation in institutional theory. This paper expands prior research and gives a first insight into the influence of environmental orientation on institutional processes in the field of sustainability reporting.

Like all studies, this study has some limitations. First, it compares only the chosen guideline of sustainability reports while ignoring that the focus of the reports can differ. However, given that the chosen guideline has a strong influence on the structure of sustainability reports and on internal processes (Hedberg and Malmborg 2003) and many previous studies also used the guideline of GRI to investigate institutional pressures on sustainability reporting (e.g. Brown, de Jong, and Lessidrenska 2009), this study chose to focus on the guideline of GRI. Second, the sample size used for the statistical analyses was relatively small. The reason for this low figure is that relatively few German Emerging Davids publish sustainability reports. In addition, matching these Emerging Davids with Greening Goliaths that provide sustainability reports, especially in terms of company size, was difficult. This issue is yet another reason for the correlation between company size and environmental orientation, which prompted me to exclude company size from the analysis. Third, this paper focuses solely on the outcomes of institutional processes (sustainability reporting) and thus overlooks everything that is interesting in the 'institutional story' (Suddaby 2010, 16). This study thus pays less attention to the ways organisations interpret and understand their institutional environment, which could give further insights into the role of coercive, mimetic and normative institutional pressures regarding different environmental orientation. Further research can address this issue by offering qualitative information on the reasons of the collected companies, to use a specific guideline for their reporting. Even if the results give first information about the influence of environmental orientation on sustainability reporting, further information is required to approve these assumptions and to search for potential internal drivers of sustainability reporting. Fourth, due to the correlation between company size and corporate environmental orientation, the significant influence of environmental orientation on a company's decision on providing a GRI report (Hypothesis 1) cannot be explained with certainty. Consequently, company size might be a further explanation for acceptance of Hypothesis 1 besides the effects of environmental orientation. As mentioned above, answering this question may need further information about the reasons behind decision making within a qualitative study. Fifth, this research is restricted to the German context and therefore limits any international comparison. However, given that governments are seen as the most important institutional drivers of sustainability reporting (Tschopp, Wells, and Barney 2012), this study investigates only German sustainability reports to exclude national influences. Sixth, the use of eco-labelling as the main selection criterion for Emerging Davids has some limitations. This selection criterion was used to enable an objective distinction and to prevent the influence of marketing on the sustainability image of the company. However, this approach does not provide any information about the company's values and beliefs towards sustainability which is necessary for a correct differentiation between Emerging Davids and Greening Goliaths. Therefore, qualitative interviews with managers and employees of the companies would be necessary. However, this was not feasible in the context of this study. This limitation therefore supports the aforementioned need for further research to use qualitative data, e.g. interviews, to better understand the differences between both types of companies.

Last, this study does not say anything about the influence of environmental orientation on whether a company does publish a sustainability report or not. It solely compares the extent of the report itself, i.e. the followed reporting guideline and provision of third-party assurance.

The limitations of the given paper provide potential questions for further research. Most notably, further research should investigate the different reasons why Emerging Davids and Greening Goliaths report according to a specific guideline to understand more about the different institutional pressures. This approach would help elaborate the 'institutional story' (Suddaby 2010, 16) to understand how and why organisations react differently. Future studies should also elaborate the reasons behind the relative high number of both Emerging Davids and Greening Goliaths that did not use any guideline for their sustainability reporting. Last, future research should compare more data about the level of reporting of Emerging Davids and Greening Goliaths, e.g. by comparing the content of disclosure via content analysis.

Notwithstanding these limitations and needs for further research, the paper contributes to previous research by conducting first empirical test of the influence of environmental orientation on institutional pressures of sustainability reporting. Findings suggest that in the field of sustainability reporting, environmental orientation can substantially influence the institutional process beyond external factors. This study suggests that institutional pressures should not only be discussed in light of external factors, but highlights the effects of internal factors such as environmental orientation in the field of institutional pressures.

Notes:

1. A sustainability report is defined as a published corporate report that provides 'internal and external stakeholders with a picture of the corporate position and

activities on economic, environmental, and social dimensions' (WBCSD 2002, 7; cited by Amran and Haniffa 2011, 141).

2. For example the Global Reporting Initiative and the International Integrated Reporting Council.
3. The ECG was founded in 2010 with the aim of supporting a sustainable development of economy and society (Felber 2015). It includes a guideline for sustainability reporting that measures and assesses the extent to which an organisation serves the common good. To date, about 400 organisations provided a sustainability reporting according to ECG.

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Appendix 1. Industry sector details.

Industry Sector	Classification	N
Food	Production	24
Energy	Service	10
Pharma and Cosmetics	Production	9
Finance	Service	6
Beverages	Production	5
Retailer	Service	4
Furniture	Production	4
Tourism	Service	2
Other production	Production	8
Other services	Service	2
Sum		74

8.2. Paper 2[2]

"It's not what you say, but how you say it": How the provision of qualitative, quantitative and monetary environmental information influences companies' internal decision making

Authors: Hummel, Philipp; Hörisch, Jacob

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Abstract

Increasingly, companies are taking into account environmental issues, such as climate change, in their decision making. Information on environmental issues can be provided for this purpose in qualitative, quantitative physical, or quantitative monetary forms. Previous studies show that the way in which information is provided significantly affects how the respective problem is perceived and responded to and in turn how this influences decision making. This paper builds on a survey-based experiment among business students. Using generalized estimating equations, it analyses the effects on companies' decision making of providing different types of environmental information. The results show that providing solely monetized environmental information can potentially devalue the perceived importance of the information and that monetization may decrease the effect of favorable environmental information on willingness to pay in companies' internal decision making. On the other hand, providing quantitative physical environmental information is likely to increase the importance ascribed to environmental issues. Thus, this article highlights that "how you say it" in terms of providing environmental information is important for companies' internal decision making.

Keywords: environmental information; companies' internal decision making; survey-based experiment; monetization; willingness to pay

1. Introduction

In recent years, public awareness of the impact of corporate decisions on environmentally sustainable development has grown significantly, putting companies under pressure to consider environmental issues in their decision making (Bebbington et al., 2007; Mahmoudi et al., 2019; Mani et al., 2018; Roca and Searcy, 2012). Nevertheless, companies are often accused of failing to take sufficient account of the consequences of their activities for environmentally sustainable development (Deegan, 2017; Rossoni et

[2] The citation form is in accordance with the journals guidelines and may differ from the rest of the dissertation.

al., 2020). Indeed, the United Nations argues that this lack of consideration “is a significant contributor to the degradation of ecosystems and the loss of biodiversity” (TEEB, 2010, p. xxvi; cited by Cuckston, 2018, p. 219). Consequently, numerous companies have developed different ways to measure the value of the natural environment and to integrate this information into their accounting and decision making (Deegan, 2017).

Previous studies from various disciplines show that the type of information provided to decision makers significantly affects how the respective issue or problem is perceived and responded to (Halpern et al., 1989; West et al., 2013; Zebregs et al., 2014). Herrmann et al. (2013) show that the quality of information provided to a decision maker influences the quality of the decision made significantly. They discuss the statistical value chain, a framework to measure the quality of decision support. In the context of consideration of the natural environment, this in turn may influence the decision makers’ perception of the importance of nature and the part it should play in decision making. Information on the value of nature can be provided and measured in different ways: in qualitative forms (e.g., as a narrative), in quantitative non-monetary forms (e.g., in specifying tonnes of carbon dioxide emissions), or in monetary forms (e.g., the monetary value of carbon dioxide emissions).

The monetization of environmental issues in particular has gained much attention over recent years (e.g., Bebbington et al., 2007; Costanza et al., 1997), entering the debate on how to assess the so-called “natural capital” of organizations (Russell et al., 2017, p. 1436), i.e., valuing nature in monetary terms in order to make an organization’s impact on nature more transparent in decision making (Cuckston, 2018). This type of providing environmental information is aimed at “turning nature into a financially valuable asset” (Cuckston, 2018, p. 219) and thus at creating financial signals or incentives for companies to protect it. Additionally, monetary environmental information is able to integrate further information, e.g. about prices, supply and demand, and can thus reflect “actual social and environmental costs of production” (Costanza et al., 2013, p.xii). This is supposed to change the way the current economy works, by tackling market failures that are seen as responsible for many environmental problems (Mildenberger, 2018).

In contrast, other researchers have warned that valuing nature in monetary terms is ultimately detrimental to its protection (see, e.g., Boiral, 2016; Sullivan and Hannis, 2017). For instance, Hines (1991) argues that using monetary measures of the value of nature does not lead to an increase in environmental awareness, but rather encourages companies “to use economic arguments to justify the destruction of nature” (Cuckston, 2018, p. 220). Critics fear that rationalist economic approaches may foster the development of environmental and social problems instead of solving them (Hines, 1991, 1992). Therefore, some scholars recommend the provision of qualitative or quantitative, non-monetary environmental information to decision makers (Bayefsky, 2014; Cho and Patten, 2007; Sinden, 2004).

Drawing on this ambiguity in current research, this paper aims to answer the following research question: *How does the type of environmental information provided influence decision making within companies?*

The results suggest that the reaction of decision makers to favorable or unfavorable environmental information is strongest when the information is provided in quantitative, non-monetary forms and weakest when it is provided in monetized forms, while the effect of providing qualitative environmental information sits somewhere in between.

The first part of this paper describes previous research dealing with the provision of different types of environmental information and their influence on decision making. Based on this literature, hypotheses are developed in part two. Section three explains the methodological approach, which builds on a survey-based experiment using information on greenhouse gas emissions. In section four, the results of this experiment are reported. Finally, section five discusses the findings, contrasted with earlier research, and derives conclusions for academia and practice.

2. Development of hypotheses

2.1 Abbreviations and definitions

This study differentiates between three types of environmental information. First, environmental performance can be measured in qualitative forms, e.g. as a narrative description of the environmental impact of the business. Second, quantitative, physical information can be used to measure environmental performance, e.g. in specifying tonnes of carbon dioxide emissions caused. Third, environmental performance can be measured in monetary forms, e.g. the calculated monetary value of carbon dioxide emissions caused.

To ease the readability, the following abbreviations are used in the following:

ANOVA - Analysis of variance

FCA - Full cost accounting

GHG - greenhouse gas

QIC – Quasi likelihood under Independence Model Criterion

QICC - Corrected Quasi-likelihood under Independence Model Criterion

WTP - Willingness to pay

2.2 Hypotheses

Numerous studies show that the type of information provided can affect the responses of decision makers to such information (Halpern et al., 1989; West et al., 2013; Zebregs et al., 2014). Generally, the effects of providing quantitative or qualitative types of information have been studied in multiple different contexts, such as situations of risk taking (Halpern et al., 1989; West et al., 2013; Zebregs et al., 2014). In the context of human health, for instance, presenting quantitative information appears to improve a decision maker's understanding of the risks and benefits of a decision, compared to the provision of qualitative information (West et al., 2013). Likewise, Marteau et al. (2000) found that presenting quantitative rather than qualitative information increases awareness of residual risks, and Man-Son-Hing et al. (2002) similarly found that providing sufficient quantitative information makes the decision maker feel more informed. Likewise, the effects on decision making of quantitative compared to qualitative information have been widely investigated in the social and economic fields (cf. Man-Son-Hing et al., 2002; West et al., 2013).

Hitherto, less attention has been paid to the question of how the provision of different types of environmental information influences decision making, although recent studies have explored this issue. However, such research mainly deals with the effect of providing environmental information to consumers or external stakeholders such as investors. In the research stream on consumer decision making, decisions (e.g., in the form of willingness to pay (WTP)) were found to be influenced by the type of (quantitative or qualitative) environmental information provided, for example in the form of labels (Hartikainen et al., 2014; Molina-Murillo and Smith, 2009; Moosmayer, 2012; Vanclay et al., 2011; van Dam and De Jonge, 2015). Similarly, the effect of providing environmental information to external stakeholders (mainly investors) in the form of environmental or sustainability reporting has been the subject of a great deal of research (cf. Alewine and Stone, 2013; Berthelot et al., 2012; Herzig and Schaltegger, 2006; Holm and Rikhardsson, 2008). In contrast, a research gap exists concerning the effects on companies' internal decision making of providing different types of environmental information. As an exception, Qu et al. (2019) developed a group decision-making framework, which expresses expert opinions about environmental management problems in interval-valued numbers. They claimed that previous decision-making processes "depend on the intuition of experts" (Qu et al., 2019, p. 835). In contrast, their technique offers quantitative assessments that result from a systematic process, and thereby expresses "the fuzziness and uncertainty of realistic decision making situation to a larger extent, and thus […] prevent[s] the loss and distortion of information" (Qu et al., 2019, p. 843).

Some authors argue that the provision of qualitative environmental information is necessary to actively involve the recipients of such information and to support their understanding of the human impact on nature (Scerri and James, 2010). Scerri and James

(2010) showed that providing solely quantitative information may limit the way environmental information is used to support sustainable activities or to challenge unsustainable activities. Likewise, in the context of evaluating corporate sustainability performance (Perrini and Tencati, 2006) and environmental labels (Leach et al., 2016), the importance of not providing solely quantitative environmental information, albeit it plays a large role, is highlighted. Quantitative environmental information is often criticized for being "based on uncertainty and incomplete information, e.g. on ecosystem biodiversity or the species interdependency" (Korhonen, 2003, p.36) as well as for aggregating qualitatively different physical flows with each other, e.g. when calculating the ecological footprint (Korhonen, 2003).

Contrarily, in reporting research, other researchers criticize corporate sustainability reporting for providing insufficient quantitative details (Daub, 2007; Dong and Burritt, 2010; Roca and Searcy, 2012; Ong et al., 2016). This is considered a problem, as quantitative information in sustainability reporting "makes reference to hard data and facts which a company can use to demonstrate economically, socially and ecologically responsible action" (Daub, 2007, p. 82). Thus, a reason for the potentially stronger influence of quantitative over qualitative information provision on decision making may be that numbers wield substantial power and authority, garner public attention and may represent a (potentially also) false impression of scientific accuracy and reliability (Sinden, 2004). Moreover, Sinden (2004) claimed that quantitative environmental information can outweigh qualitative environmental information in decision making. Opponents of providing solely qualitative environmental information stress the importance of quantifying environmental information and are critical of the predominant provision of qualitative information in corporate practice (Dong and Burritt, 2010; Gray, 2006; Ong et al., 2016). This criticism implies that quantitative information will give environmental issues greater weight in decision making, resulting, for example, in a higher willingness to pay (WTP) for more environmentally friendly options, and that such greater weight of environmental information is desriable. Therefore, the first hypothesis is as follows:

H1: Providing quantitative environmental information to decision makers engaged in company internal decision making creates a higher WTP for options with positive environmental effects, compared to qualitative environmental information.

A specific form of quantifying environmental information, full cost accounting (FCA), has gained much attention over the past decades. FCA accords a monetary value to the natural environment (Atkinson, 2000), as it measures and values "the consumption and use of environmental resources" (EC, 1992, p. 67) by a company's activities. These external costs, which can be defined as negative environmental impacts caused by a company, indicate the existence of market failures (Mildenberger, 2018), as the price of a product or service does not represent the "ecological truth", if no monetary value of nature is accounted for (Bebbington et al., 2001, p. 13; Von Weizsäcker, 1991, p. 423). For instance, current prices, which do not integrate monetized environmental information, do not take into account a company's negative environmental impacts, including for example the impact of production on biodiversity. This is identified as an important perpetrator of current environmental problems (Jones, 2010). Non-monetary measurements of environmental performance are criticized for containing a high degree of uncertainty in the evaluation of the environmental performance (Korhonen, 2003). Contrary, a monetary value is highlighted as a good measurement that can capture and reflect a wide range of different consequences of economic actions on environmental problems (Bebbington et al., 2001). FCA can contribute to ameliorating the consequences of market failures by measuring the external impacts of a company's activities in monetary terms. This means that the use and exploitation of natural resources, such as air and water, and all the costs of environmental and social problems caused by a company's activities, e.g., costs of global warming and environmental damage, should be made available to companies for their decision making (Jasinski et al., 2015). Monetary environmental information is able to integrate these internal and external impacts of a company's activity into decision making (Jasinski et al., 2015) and in this way reflects "actual social and environmental costs of production" (Costanza et al., 2013, p.xii). One advantage of measuring the value of nature in monetary terms is that it represents a type of purportedly objective data (i.e., monetized values) that is already used widely within business to convey the success of its activities (Jasinski et al., 2015; Unerman et al., 2018).

On the basis of monetized environmental information, decision making is thus professed to be more objective, transparent, and accountable with regard to environmental issues (Sunstein, 2002), making visible a company's impacts on nature that are often hidden (Unerman et al., 2018). Atkinson (2000) even argued that FCA is one of the keys to understanding corporate sustainability, as it provides the link between human welfare and environmental sustainability at the company level and beyond. Additionally, Jasinski et al. (2015) described FCA as one way to "translate a range of conflicting sustainability information into a monetary unit score" (p. 1136) and to communicate trade-offs for complex decisions efficiently. Additionally using monetary information for presenting environmental performance "can be important to raise awareness and communicate the importance of the issue to policy makers and company decision-makers" (Korhonen, 2003, p. 37).

Antheaume (2004) empirically investigated FCA in the context of manufacturing, observing that such external cost evaluation can help organizations understand their impact on nature. One of the first and best-studied examples of FCA is the company BSO, an internationally operating automation company that integrates its financial and environmental performance in its green report by developing a financial measure for the latter. In their discussion of the green report, Huizing and Dekker (1992) found it to be a promising initiative to quantify and measure the impacts of the company on the environment in monetary terms.

Similarly, the German sporting goods company Puma has developed an environmental profit and loss account that measures the environmental impact (particularly greenhouse gas (GHG) emissions and water consumption) of its activities along its value chain (Puma, 2011; Jasinski et al., 2015). This method of accounting gained positive feedback from the general public, as well as from a panel of reporting experts who assessed the project (PPR, 2012). They concluded that monetizing is “the only currently available and acceptable method to measure upstream and downstream impacts of an organization” (Jasinski et al., 2015, p. 12).

Although the abovementioned scholars and practitioners support the monetization of environmental information, others criticize monetarization for leading to less environmentally-oriented decision making (Cuckston, 2018; Cooper and Senkl, 2016). This critique of FCA is also called the ‘deep green critique’ (Bebbington et al., 2001), which argues that using rational, economic approaches such as FCA to value nature do not lead to a more environmentally friendly orientation in decision making but instead “lead people to use economic arguments to justify the destruction of nature” (Cuckston, 2018, p. 220). According to this argument, FCA may underestimate the need to raise awareness among decision makers of companies’ responsibility for environmental problems. The monetization approach may thus yield an economic view that detaches people from nature (Cuckston, 2018; Hines, 1991) and create an instrumental mindset in which decision makers act sustainably only if such actions increase their financial value (Hrasky and Jones, 2016). Furthermore, current FCA methods and tools are criticized on the grounds that they are “not accurate and provide only a crude estimate of the potential environmental and social costs” (Jasinski et al., 2015, p. 1125), as the process of measuring non-monetary issues in monetary terms, such as human wellbeing, is subjective and has not yet been scientifically validated.

The critique of measuring nature in monetary terms has been much studied in the context of the carbon emissions trading market. In their study, McNicholas and Windsor (2011, p. 1087) undertook a critical analysis of the current Australian emissions trading scheme and concluded that it “atomises nature” by transforming environmental aspects into monetary terms (Cuckston, 2018). Similarly, Andrew et al. (2010) argued that carbon emissions trading will not create the necessary change in societal mindset for supporting sustainable development.

This debate on the advantages and disadvantages of monetizing the value of nature leads to the development of the alternative hypotheses 2a and 2b:

H2a: Providing monetary environmental information to decision makers engaged in company internal decision making creates a lower WTP for options with positive environmental effects, compared to non-monetary quantitative information.

H2b: Providing monetary environmental information to decision makers engaged in internal decision making creates a higher WTP for options with positive environmental effects, compared to non-monetary quantitative information.

3. Method

We conducted a survey-based experiment in order to test the hypotheses. An experimental setting was chosen in order to control external influences (Riley et al., 2014) and thus isolate the effect of the type of environmental information provided (qualitative, quantitative, monetary) as the source of the observed change in WTP.

Respondents were presented with a questionnaire (see Appendix A), in which they were confronted with three investment situations, in each of which they were asked to imagine that they were a manager in a company intending to purchase a new machine for production. Specifically, the respondents were asked to state their WTP for a machine for which GHG emissions relative to the industry average were stated, as well as the monthly overall costs of the machine relative to the industry average. GHG emissions were chosen as the context for this study because they constitute one of the most severe environmental threats (Rockström et al., 2009; Steffen et al., 2015), companies have a huge impact on this threat, being allegedly the main perpetrators of climate change (Heede, 2014), and because information of GHG emissions can be provided not only in qualitative terms (e.g. by narratively describing the impact of an activity on GHG emissions) but also in quantitative terms and monetized in relation to markets for such emissions.

In the questionnaire, respondents were asked to state their WTP for a new machine in the form of an amount in euros, based on the machine's environmental and financial performance in relation to the industry average. Besides potential problems associated with surveying WTP (Auger and Devinney, 2007; Breidert et al., 2006), this approach comes along with important advantages, such as avoiding anchoring and framing effects and is appropriate for our focus on capturing the quantitative strength of an effect (not a qualitative preference for an option). Therefore, WTP was used as a measure for respondent's preferences following previous studies (e.g. Avitia et al., 2015; Cummings et al., 1986; Mugera et al., 2016; Shin and Hwang, 2017). A reference point for financial and environmental information was provided from which, as suggested by earlier literature, decision-makers evaluate deviations (e.g. Creyer and Ross, 1997; Kahneman and Tversky, 1979).

To be able to test the effect of the type of environmental information on WTP, three scenarios were set up. In the first scenario, the participants were provided with environmental information on the machine in qualitative terms, i.e., it was simply stated whether the performance of this machine was better or worse than the industry average.

In the second scenario, this information was provided in quantitative terms, stating that the machine emitted, respectively, 100 tonnes (25%) per year less or 100 tonnes (25%) per year more carbon dioxide (CO_2) emissions than the industry average. In scenario three, the environmental performance was monetized: it was stated that the monetary equivalent of the costs created by the GHGs emitted by the machine were, respectively, 2,000 euros more or less than the industry average. The values of 100 tonnes of CO_2 and 2,000 euros were chosen to ensure that the magnitude of the environmental performance surplus or deficit was the same in both scenarios, if a price of 20 euros per tonne of CO_2 emissions was assumed. This price reflects the average price of a tonne of CO_2 in Germany, the context of this study, in the 12 months preceding the survey. To avoid bias, the scenarios were randomly allocated to the participants.

In each scenario, participants were confronted with four purchasing options, for which the environmental information stimulus as well as the monthly overall costs of the machine were varied in the following manner. For two machines, an environmental performance better than industry average CO_2 emissions was assumed, whereas, for the other two machines, the environmental performance was worse than the industry average. In addition, financial information was provided. For one of the two environmentally unfavorable and one of the environmentally favorable alternatives, yearly costs of 15,000 euros more than the industry average were assumed, whereas, for the third alternative, yearly costs of 15,000 euros less than the industry average were assumed, representing favorable and unfavorable financial performance. This resulted in the following matrix of four purchasing decisions: one machine represented a win–win and one a lose–lose situation, in which both the relative CO_2 performance and the costs were better or worse than the industry average; the other two represented "trade-offs," where one aspect (i.e., environmental or financial information) was better and one worse than the industry average.

In addition to stating their WTP for the respective machines, participants were asked for information on the following personal attitudes, in order to capture possibly interfering effects. First, WTP for an environmentally (un-)friendly machine can be expected to be influenced by a respondent's concern about climate change. Therefore, the "Concern about Climate Change" scale devised by Metag et al. (2017) was included in the questionnaire. The reliability of this construct was confirmed by a Cronbach's alpha of 0.930. Second, since risk propensity can affect business decision making (Hung and Tangpong, 2010), respondents were asked to assess three items on their willingness to take risks, as suggested by Hummel and Hörisch (2020; cf. Hung and Tangpong, 2010). Again, the reliability analysis showed sufficiently high values (Cronbach's $\alpha_{risk} = 0.661$), given that the number of items was smaller than ten (Loewenthal, 2004). Last, the social desirability scale, comprising six items, as suggested by Kemper et al. (2014), was used to capture how far the responses were affected by the tendency of participants to report socially desirable answers (cf. Auger and Devinney, 2007) (Cronbach's $\alpha_{social\ desirability}$ =

0.664).

The respondents were business students from two German universities, which were purposefully selected, one being a university of applied science with a very high degree of practice orientation, and the other offering a dual-study program in which the business students work in companies while following their course. Thus, the students surveyed showed substantially higher degrees of practical experience and knowledge than many of their contemporaries. Additionally, the participating students all had adequate accounting experience, having attended at least one course on accounting. We chose business students for the study, “as business students are future decision makers in the situation of interest” (Hummel and Hörisch, 2020, p. 195). Ribbink and Grimm (2014) discussed and broadly found strong justification for using students as subjects in business studies, “although they are generally less experienced than professionals at international negotiations and the context of purchasing” (Ribbink and Grimm, 2014, p. 124). Comparing the results of a real task experiment among managers and students, Montmarquette et al. (2004) concluded that the results were strikingly similar.

Additionally, in experimental research, using students helps to create homogeneity within the sample, thereby maximizing control and internal validity (Thomas, 2011). It is therefore frequently suggested as a first step in experimental research, before the findings are validated in field experiments (Rack and Christophersen, 2007). The students were informed that participation was voluntary and that there would be no adverse consequences if they chose not to participate. In total, 141 respondents were contacted for the survey, of which 134 participated in the survey. Each participant created multiple observations on WTP, of which observations with missing data needed to be excluded. The final sample thus consisted of 523 observations from 134 individuals. In a robustness check, all responses from respondents with any missing data (on other than the respective observation) were excluded (see Appendix B, which did not yield different results with regard to hypothesis testing). The descriptive statistics of the final sample, as well as the correlation matrix, are summarized in Table 1.

Table 1. Descriptive statistics and correlation matrix.

Research variable	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
1. WTP in 1000€	1.000	.031	-.266**	-.199**	.057	.139**	.095*	.108*
2. Type of information provision		1.000	.002	-.002	-.013	.047	.074	.032
3. Environmental performance surplus			1.000	.002	-.012	.000	-.009	-.001
4. Financial performance surplus				1.000	-.007	-.003	-.008	.001
5. Female gender					1.000	-.169**	.168**	-.262**
6. Social desirability						1.000	.205**	.515**
7. Risk averseness							1.000	.190**
8. Concern about climate change								1.000
Mean	415.083	1.994	.491	.497	.430	-.008	-.007	.000
S.D.	236.059	.806	.500	.500	.496	.613	.741	.843
Minimum	.000	1.000	.000	.000	.000	−1.822	−2.018	−3.224
Maximum	4000.000	3.000	1.000	1.000	1.000	1.091	1.791	.582
N	523	523	523	523	523	523	523	523

The upper part of the table presents the Pearson correlations between all variables in the dataset. Two-sided tests of significance were performed and levels of significance are indicated as follows: ** p < 0.01; * p < 0.05.
The lower part of the table presents the descriptive statistics, including the arithmetic mean (Mean), standard deviation (S.D.), minimum and maximum values as well as the number of observations per variable (N).

4. Analysis and findings

To be able to assess the hypotheses, generalized estimating equations were used (Table 2). This technique, which was introduced by Liang and Zeger (1986), is a means of analyzing whether some observations differ significantly from others, even though the observations are not completely unrelated (Hardin and Hilbe, 2002). As each respondent stated his or her willingness to pay up to four times, each contributed up to four observations for this study. Thus, the observations cannot be considered entirely independent from one another. Therefore, simpler techniques such as linear regression analyses or ANOVA could not be used. The sample size of 134 individuals reporting 523 investment decisions clearly exceeded the common thresholds of, respectively, 30 or 50 subjects (Ghisletta and Spini, 2004; Weaver, 2009) for performing generalized estimating equations.

The first model in Table 2 includes only the control variables, i.e., the gender of the participant, environmental performance, financial performance, willingness to take risks, and the participant's concern about climate change. The control variable on social desirability was included in the model not only to capture a potential social desirability bias but to also adjust the results for such potential bias. Model 1 reveals that for the sample investigated favorable environmental ($b=124.891$, $p<0.01$) as well as favorable financial information ($b=92.890$, $p<0.01$) exert a significant, positive influence on WTP.

In Model 2, additionally the variable distinguishing the different types of environmental information provided was included, as well as the interaction effect between the type of information provided and environmental information. As indicated by the lower QIC and QICC values for Model 2 compared to Model 1, the addition of these variables increases the model fit. In Model 2, the interaction effect between positive environmental performance and quantitative communication of this performance is significant (b=104.635, p<0.01). Thus, if environmental performance is above industry average and this is communicated in quantitative form, WTP increases significantly in our sample, compared to scenarios where such information is provided in qualitative or monetary form. As in Model 1, the control variables of environmental and financial performance exert significant positive influences on WTP (p<0.01).

Table 2. Generalized estimating equations.

Dep. Variable	WTP	WTP	WTP	WTP
Model	1	2	3	4
Main effects				
Qual. info. provision	−/−	−44.931 (51.689)	26.998 (54.727)	−/−
Quant. info. provision	−/−	−64.858 (34.994)	Ref. cat.	−65.159 (33.586)
Monet. info provision	−/−	Ref. cat.	−/−	Ref. cat.
Interaction effects				
Env. perf. surplus X qual. info. provision	−/−	63.709 (51.391)	−40.438 (54.330)	−/−
Env. perf. surplus X quant. info. provision	−/−	104.635** (27.795)	Ref. cat.	103.809** (28.042)
Env. perf. surplus X monet. info. provision	−/−	Ref. cat.	−/−	Ref. cat.
Controls				
Constant term	327.389** (25.143)	364.881** (29.507)	305.089** (42.642)	374.019** (33.339)
Environmental performance	124.891** (18.878)	67.390** (16.060)	171.484** (22.744)	67.390** (16.060)
Financial performance	92.890** (14.818)	92.926** (15.023)	101.287** (21.001)	79.940** (9.968)
Female gender	−38.778 (24.348)	−39.559 (23.018)	−63.565* (27.558)	−43.832 (31.094)
Social desirability	42.542 (22.387)	42.286 (22.613)	35.660 (27.106)	35.162 (24.617)
Risk averseness	13.442 (18.178)	13.033 (17.317)	14.880 (20.086)	26.914 (27.911)
Concern about climate Change	18.082 (12.639)	18.562 (12.193)	32.560** (12.571)	5.589 (17.634)
Model Summary N	523	523	355	352
QIC	24,996,325.379	24,736,594.672	21,967,601.106	9,227,840.097
QICC	24,996,320.185	24,736,587.128	21,967,597.588	9,227,821.174

Four models each using Generalized Estimating Equations were performed. For each main effect, interaction effect and control variable unstandardized regression coefficients are reported and the standard errors are displayed in brackets.

The levels of significance (using two-sided tests of significance) are indicated as follows: ** p < 0.01; * p < 0.05. The model summary displays the sample size (N), as well as the model fit, measured by the Quasi-likelihood under Independence Model Criterion (QIC) and the Corrected Quasi-likelihood under Independence Model Criterion (QICC).

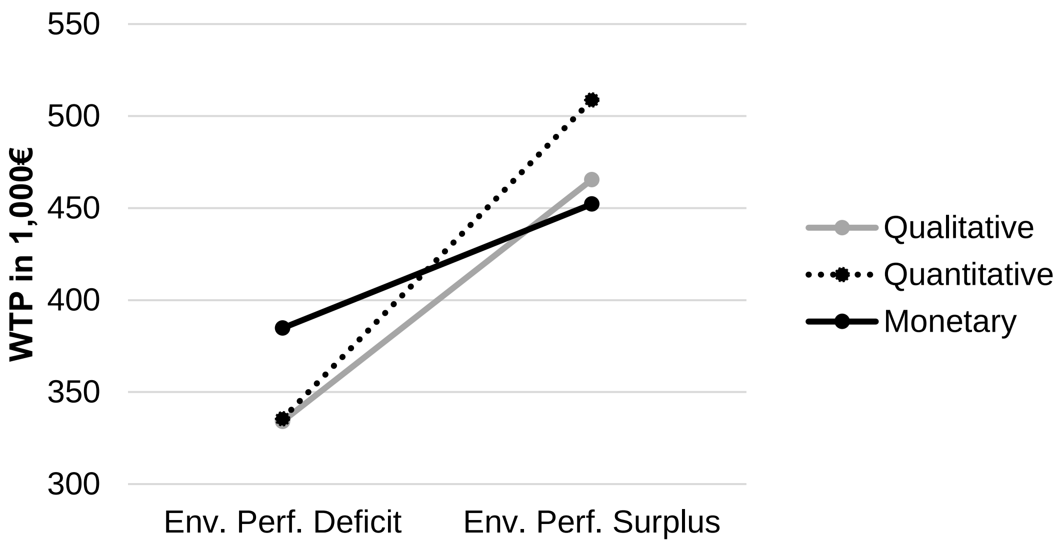

Figure 1. Mean WTP differentiated by information provision and environmental performance.

To be able to specifically test Hypothesis 1, i.e., that providing quantitative environmental information creates higher WTP for decision options with positive environmental effects, compared to providing such information in a qualitative manner, only those scenarios with qualitative and (non-monetary) quantitative information were considered in Model 3. As may be expected based on Figure 1, the interaction term of superior environmental performance and qualitative information provision is negative. However, the coefficient is not significant. Thus, Hypothesis 1 cannot be confirmed based on our sample. In addition to the control variables that were also found to exert significant influences in the first two models (i.e., financial and environmental performance), female gender ($p<0.05$) and concern about climate change ($p<0.01$) exerted significant positive influences in Model 3.

To test Hypotheses 2a and 2b, which refer to a comparison of quantitative monetary and quantitative non-monetary information provision, the scenarios based on qualitative information provision were excluded in Model 4. As the interaction effect between superior environmental performance and quantitative, non-monetary information provision is positive and significant ($b=103.809$; $p<0.01$), Hypothesis 2a can be supported, i.e., among the investigated respondents providing monetary, quantitative environmental information creates lower WTP for options with positive environmental effects, compared to non-monetary quantitative information. Consequently, alternative Hypothesis 2b is rejected. As in Models 1 and 2, among the control variables, only environmental and financial performance exerted significant influences.

Overall, the analysis summarized in Figure 1 reveals that the effect on WTP of providing decision makers engaged in internal investment decisions with environmental information is least pronounced if this information is monetized and strongest if the information is communicated in quantitative form. Besides, analyzing the control variables in all four models highlights that not only environmental performance, but also financial performance exerts a significant influence on WTP, highlighting that the respondents were also strongly guided by financial incentives.

5. Discussion and conclusions

5.1 Discussion with reference to existing literature

The above analysis informs the debates on the benefits of quantifying and monetizing environmental information. No significant difference was found in the strength of the effect of providing information quantitatively and qualitatively on WTP in companies' internal decision making. In contrast, earlier research in the context of risk-related decisions showed significant differences between the effects of providing (non-environmentally related) quantitative and qualitative information (Marteau et al., 2000; West et al., 2013). The results concerning Hypothesis 1 thus suggest that differences exist between the context studied in this article (i.e., providing environmental information) and other contexts. A possible explanation for this finding is that many decision makers in business are unable to put the quantitative environmental information provided in context, as they are unsure whether the given numbers represent large or small environmental impacts. Therefore, these decision makers may react similarly to quantitative and qualitative environmental information, as they reduce quantitative environmental information to its qualitative core - whether such information represents an advantage or disadvantage compared to given reference points such as the industry average (cf. Creyer and Ross, 1997; Kahneman and Tversky, 1979). Decision makers who are more familiar with environmental issues will find it easier to put quantitative environmental information into context. This interpretation of our results, which assumes that decision makers' WTP in the quantitative information scenario will vary according to their background knowledge on environmental issues, is supported by the relatively high standard deviation found for the mean WTP for options with a quantitatively communicated environmental surplus ($SD_{env\ perf.\ surplus\ \&\ quant.info.provision}$=167,162€); this may be due to differing states of knowledge on environmental issues, compared to the qualitatively ($SD_{env.perf.surplus\ \&\ qual.info.provision}$=126,510€) or monetarily communicated surpluses ($SD_{env.perf.surplus\ \&\ monet.info.provision}$=121,851€). The assumption of previous scholars that qualitative information is necessary to help people understand the respective impacts on nature and sustainable development (cf. Scerri and James, 2010) could not be confirmed in this study, as no significant difference between quantitative and qualitative provision of environmental information was observed in relation to this aspect. An explanation for only non-significant differences between quantitative and qualitative information provision could be that neither kind of information reflects the value added or lost to or for the society, as quantitative and qualitative environmental information do not reflect prices, supply or demand.

With regard to the effects of providing monetized environmental information (Hypotheses 2a and 2b), the rather optimistic assumptions on this approach articulated in earlier research (Atkinson, 2000; Jasinski et al., 2015; Unerman et al., 2018; Sunstein, 2002) cannot be confirmed based on the sample investigated. The present experiment does not indicate that presenting solely monetized environmental information increases decision makers' awareness of environmental aspects (cf. Cuckston, 2018; Mildenberger, 2018). In contrast, our findings tend to align better with those who are skeptical about monetization (e.g. Hrasky and Jones, 2016; Lehman, 2017), which they argue may lead to an instrumental mindset in which nature is protected only if protection delivers sufficient financial value. The results of the present experiment show that solely presenting environmental performance in monetary terms can indeed lower the perceived importance of such information, as suggested by Boiral (2016) as well as Sullivan and Hannis (2017), as WTP for environmentally favorable options is lowest if solely monetized environmental information is provided. However, since analyzing the control variables highlighted that respondents were also strongly guided by financial incentives, it is important to keep in mind the financial impacts of the decision options when trying to support sustainable decision making.

5.2 Implications for theory and practice

Previous research discussed different modes of presenting environmental information to spur environmentally oriented decision making (e.g., Cuckston, 2018; Jasinski et al., 2015). Our study contributes to this research by providing insights into the influence of the means of providing environmental information on WTP in companies' internal decision-making. The findings show that using solely monetary environmental information tends to decrease WTP for environmentally friendly investment alternatives and has less influence on decision making than non-monetary environmental information.

Besides these academic insights, the results of this study are also of practical relevance. First, while the results cannot inform the decision to aim at higher or lower levels of environmental protection, our paper does show that if a company aims to reduce its environmental impact, the way how it provides environmental information to company internal decisions makers is important. It demonstrates that, if a higher priority should be ascribed to environmental issues in companies' internal decision making, solely using monetization is unlikely to achieve this goal, as it decreases the positive effect on WTP of favorable environmental information. This does not imply a general rejection of monetization, as its advantages, such as representing a type of information decision makers are familiar with (Unerman et al., 2018) or increased accountability (Sunstein, 2002), have not been tested in this research. However, if the aim is to increase WTP for more environmentally friendly decision options, these potential positive side effects of monetization seem to be outweighed by the negative effect on WTP. Thus, if a company expects its decision makers to put emphasis on environmental aspects in decision making, it should provide the relevant environmental information in quantitative, non-monetary terms. However, in situations in which monetized environmental information is readily available, this may cause the dilemma of whether existing monetized information should be withhold from decision makers, if a company aims at attaching a higher importance to environmental aspects. It goes beyond the scope of this paper to judge this ethical decision, which is closely linked to the discourse on the (un)ethicality of nudging in general and accompanying challenge to provide unbiased information (Kasperbauer, 2017; Pilaj, 2017; Sunstein, 2015). Still, in this context, it should be noted that in practice multiple more options of providing (and combining) different types of environmental information exist. These options include providing quantitative as well as monetized environmental information, which was not considered for this analysis and would allow overcoming the dilemma of actively withholding existing (monetized) information. Additionally, since the financial performance of an alternative had significant influence on WTP as well, we recommend the combined provision of financial information with quantitative environmental information.

Second, this research reveals a positive side effect of mandatory external sustainability and environmental reporting. As argued in earlier research (e.g., Qian and Schaltegger, 2017), sustainability reporting requires companies to collect and process quantitative environmental information. Qian and Schaltegger (2017) argued that such information gathered for this purpose is consequently also used in companies' internal decision making and is likely to influence corporate environmental performance. The present study suggests a possible reason for this effect, as sustainability reporting may create quantitative information, the provision of which is likely to increase the importance ascribed to environmental issues in internal decision making.

A third practical implication of this study is that it highlights the importance of educating business decision makers on the fundamentals of environmental sustainability. Through (further) education measures specifically designed to improve background knowledge on environmental issues (cf. Godemann et al., 2014; Hesselbarth and Schaltegger, 2014), managers can be empowered to put quantitative environmental information into context.

Fourth, since financial performance also had a significant influence on WTP, the findings highlight that monetary incentives may further support sustainable decision making in companies. However, as this discussion goes beyond the scope of this paper, it needs to be investigated by future research.

5.3 Limitations and future research

While acknowledging the academic and practical insights, this research also suffers from limitations, which should be avoided in future research. First, the paper is based on a survey based experiment, not on a real choice experiment. Given that the context of this study is companies' internal decision making, this limitation is difficult to overcome. Second, using direct elicitation of WTP in experiments has been criticized for being unreliable, particularly when used to capture preferences (Ryan and San Miguel, 2000). Although we are aware of the potential problems associated with a direct elicitation of WTP (Auger and Devinney, 2007; Breidert et al., 2006), this approach better allows to avoid framing and anchoring effects and therefore is appropriate for capturing the quantitative strength of an effect (not a qualitative preference for an option). Third, this experiment concerned only the type of information provided (i.e., qualitative, quantitative, or monetary), not the content of such information. Future research should analyze possible interaction effects between the magnitude of environmental surpluses and deficits and the quantitative, qualitative, and monetary information provided. It may be expected that the difference in the effects of providing environmental information in quantitative and qualitative form varies with the magnitude of the quantitative information provided.

Fourth, since our experiment only investigates the influence of the provision of one type of environmental data on WTP we cannot make a valid statement about the influence of a combination of different types of environmental data, for example combining monetary and non-monetary quantitative environmental data as recommended by Korhonen (2003). In real situations, several kinds of information are needed to make reliable decisions. Therefore, this study does not recommend withholding specific kinds of information from decision makers. Instead, further research should investigate the influence of combining different types of environmental information in decision making.

Fifth, this study presented four different decision-making scenarios with different kinds of tradeoffs or synergies between financial and environmental performance. The important question that could not be addressed in the given study is which scenario most appropriately reflects a specific companies real-life circumstances. Future research needs to address the question, how these trade-offs can be kept in mind in decision making and which kind of measurement may reflect these trade-offs best.

Sixth, the given study does not investigate the influence of the quality of the provided environmental data on decision making as exposed by Herrmann et al. (2013). Future research should investigate the effect of data quality on decision making in the field of company internal decision making with regard to sustainability, for example by using the framework proposed by Herrmann et al. (2013), and address the question how reliable environmental data can be provided for decision makers.

Finally, and most generally, our paper cannot inform the decision whether more or less environmental protection should be aimed at. It can merely show that if a company aims to reduce its environmental impact, the way how it provides environmental information to company internal decisions makers is important.

Besides attempting to overcome these limitations, future research should aim at validating or falsifying the findings of this article with regard to environmental issues other than GHG emissions. Moreover, further studies could (qualitatively) analyze the reasons behind the effects observed in this research. This will help to reveal whether WTP on the part of individual decision makers is indeed influenced not only by their concern about environmental issues but also by their ability to put quantitative environmental information into context. As mentioned before, future research should address the impacts and possibilities of providing financial incentives, company internal or governmental, for supporting sustainable decision making.

Additionally, Korhonen (2003) points out that a monetary approach fails "to reflect all scarcities" (p. 37) and therefore recommends using quantitative, non-monetary as well as monetary environmental data to inform decision makers. Interestingly, in our analysis financial performance as well as environmental performance both influence WTP. In line with Korhonen (2003), we therefore recommend future research to analyze the effects of providing both, quantitative, as well as monetary information.

In conclusion, the claim in the title of this article, that "it's not what you say, but how you say it," can be partly confirmed. As the content of the information (i.e., whether a decision offers environmentally favorable or unfavorable options compared to industry average) is obviously important, it is not solely about the "how you say it." Nevertheless, this paper shows that the form in which environmental information is provided exerts a substantial moderating influence on companies' internal decision making.

Last, it is important to note that the experiment relies on a student sample. While this has the advantage of internal homogeneity (Thomas, 2011) and is thus a usual first step in experimental research (Rack and Christophersen, 2007), the external validity of the findings could be improved by conducting experiments among more diverse samples, including practitioners. Additionally, real choice experiments validating or falsifying our findings would allow that participants are actually effected by higher stated WTPs and could thus create results which are closer to a real-world setting.

6. References

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Appendix A: Questionnaire

Scenario Description:

You are a production manager in a medium-sized company that produces battery cells. Annual sales: € 50 million; annual profit: € 3.6 million. One of your production machines has to be replaced by a new one at the beginning of the new year. You have been working with the same manufacturer for many years. He will talk to you about his new machines and negotiate the price with you. In preparation for the interview, your employee has already sent you information about the machines to be negotiated and the industry comparison.

The following information was selected by your employee to prepare you for your meeting:
Prices for comparable machines on the market with the same performance: 470,000 €, 550,000 € and 390,000 €. There is no information on the environmental impact of these alternatives. The total monthly cost of Machine X is € 15,000 more/less per year than the industry average.

Group 1: Machine X consumes less/more CO_2 emissions per year than the industry average. CO_2 emissions are a major cause of climate change.

Group 2: Machine X consumes 100 tons (25%) less/more CO_2 emissions per year than the industry average. CO_2 emissions are a major cause of climate change.

Group 3: Machine X consumes € 2.000 (25%) less/more CO_2 emission costs per year than the industry average. CO_2 emissions are a major cause of climate change.

How much are you willing to pay for this machine? Please enter your maximum price in €. This value may be higher or lower than the prices of the other comparisons listed above.

Additional items included per construct:

Risk taking (Hummel and Hörisch, 2020):

- I like opportunities, even if they can involve a risk.
- Even if something has a high profit promise, I do not want to be the first to try it. I prefere waiting until it has been tested.
- If I have to make a decision with unclear consequences, I prefer to choose the safer option, even if it results in less profit.
- I like to try new things, even though I know that some things could disappoint me.
- For more profit, I like to accept higher risks.

Social desirability scale (Kemper et al., 2014)

- In discussions, I always remain calm and objective.
- Even when I'm stressed, I always treat others kindly and politely.
- When I talk to someone, I always listen attentively.
- It happened that I took advantage of someone.
- It happened that I threw garbage in the countryside or on the street.
- Sometimes I only help someone if I can expect something in return.

Concern about climate change' scale (Metag et al., 2017)

- Climate change is a serious problem.
- Climate change is causing an increase in extreme weather events.
- It is important to take action against climate change as soon as possible.
- I'm very worried about climate change.
- Climate change is made by humans.
- Climate research agrees that global warming is real.
- Climate change is happening nowadays.

Appendix B: General Estimating Equations (Robustness Check)

Dep. Variable	WTP	WTP	WTP	WTP
Model	1	2	3	4
Main effects				
Qual. info. provision	-/-	-46.383	26.381	-/-
		(52.166)	(54.894)	
Quant. info. provision	-/-	-65.347	Ref. cat.	-66.032
		(35.454)		(33.978)
Monet. info provision	-/-	Ref. cat.	-/-	Ref. cat.
Interaction effects				
Env. Perf. Surplus X qual. info. provision	-/-	63.503	-46.461	-/-
		(51.891)	(54.241)	
Env. Perf. Surplus X quant. info. provision	-/-	109.964**	Ref. cat.	109.964**
		(27.663)		(27.663)
Env. Perf. Surplus X monet. info. provision	-/-	Ref. cat.	-/-	Ref. cat.
Controls				
Constant term	326.615**	364.544** (29.910)	304.025**	373.984**
	(25.604)		(43.283)	(34.196)
Env. performance	125.624**	67.390**	177.355**	67.390**
	(19.201)	(16.060)	(22.524)	(16.060)
Financ. performance	95.153**	95.153** (15.155)	105.045**	82.081**
	(15.155)		(21.413)	(9.896)
Female gender	-39.962	-40.779 (23.815)	-66.153*	-45.431
	(25.322)		(28.774)	(32.787)
Social desirability	44.278	44.036 (23.083)	37.474	36.017
	(22.900)		(27.815)	(25.683)
Risk averseness	14.599	14.287 (18.134)	16.605	27.933
	(19.087)		(21.215)	(29.674)
Concern about climate change	17.010	17.223 (12.397)	31.225*	4.923
	(12.881)		(12.716)	(18.069)
Model Summary				
N	508	508	340	340
QIC	24,909,893.789	24,632,269.955	21,851,866.329	9,154,846.409
QICC	24,909,888.551	24,632,289.448	21,851,863.018	9,154,826.932

** p<0.01; * p<0.05; Unstandardized regression coefficients are reported; Standard errors are reported in brackets

8.3. Paper 3[3]

The hidden power of language How 'value creation accounting' influences decisions on expenditures, cost reductions and staff costs

Authors: Hummel, Philipp; Hörisch, Jacob

Publication: Hummel Philipp, & Hörisch Jacob (2020). The hidden power of language: How "value creation accounting" influences decisions on expenditures, cost reductions and staff costs. Sustainability Accounting, Management and Policy Journal, 11, 187–206.

Abstract

Purpose –Stakeholder theory research identifies changes in language as one possible mechanism to overcome the deficiencies of current accounting practices with regard to social aspects. This study aims to examine the effects of the terms used for specific accounts on company internal decision-making, drawing on the example of "value creation accounting".

Design/methodology/approach – The study uses a survey based-experiment to analyze the effects of terms used for specific accounts on decision-making, with a focus on social aspects (in particular expenditures for staff) in cost reduction and expenditure decisions.

Findings – The findings indicate that wordings, which more closely relate to value creation than to costs, decrease cost reductions and increase the priority ascribed to the social aspect of reducing staff costs in times of financial shortage. The effects of terms used on cost reductions are stronger among female decision makers.

Practical implications – The analysis suggests that conventional accounting language best suits organizations that aim at incentivizing decision makers to primarily cut costs. By contrast, if an organization follows an approach that puts importance on social aspects in times of financial shortage and on not doing too sharp cost reductions, value creation-oriented language is the more effective approach.

Social implications – The study suggests that the specific terminology used for accounts should be chosen more carefully and with awareness for the possible effects on cost reduction decisions as well as on social consequences.

Originality/value – This study contributes to a better understanding of the relevance of language in accounting. It suggests that the terms used for accounts should be chosen purposefully because of their farreaching potential consequences for stakeholders as well as for the organization.

[3] The citation form is in accordance with the journals guidelines and may differ from the rest of the dissertation.

Keywords: Employees, Gender, Language, Decision-making, Accounting, Stakeholder theory

1. Introduction

In the past decades, various accounting tools have been developed, which aim at complementing conventional accounting systems to explicitly address social issues in accounting (cf. Schaltegger et al., 2002; Windolph et al., 2014). These tools include approaches such as social cost accounting (Pouw and Kakes, 2013) or social return on investment (Gutiérrez-Nieto et al., 2016; Gamble and Beer, 2017; Solomon and Nelson, 2013). From a stakeholder theory perspective, however, it has been highlighted that most of these tools fall short in addressing the question for whom value is created (Schaltegger et al., 2017; Hall et al., 2015; Harrison and van der Laan Smith, 2015; Mitchell et al., 2015). Additionally, stakeholder theorists problematized that such tools usually aim at establishing additional accounting approaches that serve as an add-on to conventional accounting, therefore running the risk of not to be linked to the core business activities of a company (Hörisch et al., 2014). Schaltegger et al. (2017), thus, conclude that current approaches are insufficient. As one way to overcome the above-stated deficiencies, they suggest that "modifications in the vocabulary that is currently used to describe business activities" is needed to sensitize decision makers for the recognition of additional stakeholders, as the terms currently used are too narrowly focusing on financial aspects (Schaltegger et al., 2017, p. 16). Similarly, Mitchell et al. (2015) emphasize that a new vocabulary in accounting is needed, to enlarge the scope of stakeholders considered. In this research, we analyze how the terms used for specific accounts can influence expenditure and cost reduction decisions and its influence on the recognition of additional stakeholders (particularly in times of financial shortage). We focus on employees as an additional stakeholder group to be considered in accounting, as employees are primary stakeholders, of central importance for nearly all businesses (Freeman et al., 2010) and are considered an important aspect of the social dimension of corporate sustainability (Thomsen and King, 2009).

To test the effect of language wording, this article analyzes a specific accounting tool, i.e. "value creation accounting" (VCA), which has been developed in German sustainability-oriented companies, such as the organic wholesaler "Alnatura" or the drugstore chain "dm". The German term used for VCA is "Wertbildungsrechnung". While VCA is mainly used by companies in German-speaking countries, it is generally also applicable for companies in non-German-speaking countries. In contrast to the before-mentioned social accounting tools, such as social cost accounting or social return on investment (Gutiérrez-Nieto et al., 2016; Gamble and Beer, 2017), which set up an additional accounting system that explicitly addresses social issues, VCA does not provide an addition to conventional accounting, but aims at altering or replacing conventional accounting and by that, at implicitly creating consequences for decision-making (Malter, 2011; dm, 2017). Compared to the conventional accounting tools, which describe all expenditures as costs that reduce profit, VCA uses a different, more value-oriented language design. By using alternative terms for the single accounts, the purpose of VCA is to turn the attention of decision makers to the social aspects of economic decision-making, i.e. the impact of managers' decision-making on stakeholders. Its choice of terms aims to reflect that expenditures relate to the different factors needed to create value. For example, the term "staff costs" of conventional accounting tools is replaced with the term "employee income" in VCA; "profits" are labeled as "debt relief", and the term "advertising costs" is replaced by "customer communication". In so doing, VCA aims to reflect which activities and which stakeholder groups contribute to value creation. Therefore, the expenditures for these groups and the respective activities are not labeled as costs, but as factors contributing to value creation. Table I provides an overview of the vocabulary used in conventional accounting (i.e. direct costing) as well as in VCA. Besides changing the terminology used, the order of the accounts in VCA is altered. It follows a logic that goes back to the ideas of Rudolf Steiner (1996) to present economic processes in an alternative manner, reflecting so-called "currents" and "reverse currents" which reflect steps in value creation. Therefore, sales are provided as the last item of the calculation.

Table I. Comparison of the wording used in conventional accounting and VCA

Conventional wording	Value-oriented wording
Staff costs	Employee income
Advertising costs	Customer communication
Cleaning costs	Cleaning performance
Energy costs	Energy
Costs for employee acquisition	Employee recruitment
Traveling expenses	Traveling performance
Room costs	Rent and lease
Profit / Loss	Debt relief / Debt

In choosing an alternative wording in accounting, VCA addresses a key element of stakeholder theory, i.e. the integration thesis (Freeman et al., 2010). The integration thesis postulates that most business decisions have an implicit ethical view and, vice versa, most ethical decisions have an implicit view about business. It, therefore, argues for a stronger integration of ethical and economic concerns. Stakeholder theory, thus, rejects the separation fallacy, which assumes that decisions are either business or ethical decisions (Freeman et al., 2010). Likewise, VCA aims at integrating the ethical aspects of decision-making to the accounting process and at making this link between business and ethical decisions visible to accountants.

Through the conscious choice of a different wording of accounting terms, VCA aims at sensitizing decision makers for social aspects of decision-making. Consequently, social issues that are affected by the economic process to be accounted for can be expected to receive more attention in VCA. However, the actual effects of using VCA have not yet been analyzed empirically. This research gap is addressed in this article.

The next section provides a literature review dealing with stakeholder theory, accounting, language use and performativity of accounting and develops hypotheses based on this review. Section 3 explains the methodological approach, which builds on a survey-based experiment. In Section 4, the results of this experiment are reported, to examine the effects of using VCA terms for the single accounts on the willingness to make expenditures and cost reductions, with a particular focus of reductions in staff costs during times of financial shortage. Finally, Section 5 discusses the findings against earlier research and derives conclusions for theory and practice.

2. Literature review and development of hypotheses

2.1 Literature review

Accounting research has intensively dealt with the question how accounting contributes to the social construction of reality (Hines, 1988; Cooper, 1992) and how the language used in accounting influences rational decision-making (Costa et al., 2014). According to Hines (1992), accounting presents the world in a logical and analyzable manner. Thus, accounting calculations provide a basis for rational decision-making, which may lead to efficient and profit-maximizing decision. Accounting is assessed to be materialistic and reductionist, as it focusses on material reality and only recognizes those aspects of goods and services that can be traded in markets (Hines, 1992). These implicit values of accounting and the implied perception of reality have been associated with what is called the "universal masculine" in many fields (Hines, 1992; Cooper, 1992). Cooper (1992) argues that this "universal masculine" is based on egocentrism, fear and hierarchical oppositions (Cooper, 1992).

Indeed, previous studies emphasize "that social reality is reflexively constituted by accounts of reality, and that the decisions and actions based on these accounts construct, maintain and reproduce social reality" (Hines, 1991, p.317). In this context, language plays a particularly important role. Many authors even termed accounting as the "language of business" (Lavoie, 1987, p. 579; Belkaoui, 1978, p. 97, cited by Sandell and Svensson, 2016), as it transports information between the preparers and the users of accounting information. In other words, accounting can be understood as a system of symbols that is "both a tool for describing, presenting or even constructing a picture of reality, and a tool of communication" (Masztalerz, 2016, p. 100). Literature dealing with the effect of language in financial narratives has shown that the use of language in accounting influences the construction, maintenance and transformation of world views and social legitimating (Sandell and Svensson, 2016). Masztalerz (2016) concludes that financial narratives do not only report financial performance but are able to produce and reproduce economic reality.

Additionally, the role of different narratives on financial judgment and decisions has been examined in accounting literature in different ways. This literature can be broadly classified as:

- research on the performative use of accounting; and
- research that discusses the language used in financial narratives, e.g. the verbal description of numbers and figures (Sandell and Svensson, 2016).

To contribute to the first branch, earlier research has exposed many ways in which accounting constitutes a language. This view led to the above-mentioned designation of accounting as the language of business. Accounting, like a natural language, works as a system of symbols that enables communication between the creators and the users of accounting information (Sandell and Svensson, 2016). Such accounting information is not only a representation of past performance, but also of terms that influence reality, e.g. by legitimating decisions or disqualifying opportunities (Vollmer, 2007; Sandell and Svensson, 2016). In this way, accounting can determine the importance of an economic phenomenon, while some phenomena are emphasized and others are neglected. Building on the case of a conflict between Royal Dutch Shell and a local community in Ireland, Killian (2010) for instance shows how the use of different language terms of accounting can lead to misunderstandings and highlights how the limitations of accounting as a language hindered the agents to understand each other's concerns.

The second branch of research discusses the performativity of language use in accounting. Performativity can be defined as the relationship between language and the effect language has on behavior (Parker, 2013). This branch of research has examined the role language plays in the accounting domain. Extant accounting literature has acknowledged the role of narratives as an example for using language in accounting in different ways (Craig and Amernic, 2008). In this branch of research, the language used in accounting is understood as an attempt to present quantitative information more readable (Clatworthy and Jones, 2003), and to influence the public perception of the company "by offering explanations, rationalizations and legitimation of its activities" (Aerts, 2001, p. 4; cited by Sandell and Svensson, 2016).

In this way, accounting narratives can be used to produce specific representations of a corporation (Sandell and Svensson, 2016). However, this second branch of literature on language and accounting almost exclusively focuses on the effects of narratives in financial and sustainability reports (Coulson et al., 2015) and has largely ignored the use of language in accounting tools.

Indeed, the influence of the monetary data published in financial reporting on economic behavior has been elaborated in a variety of studies (Bhattacharya et al., 2007; Francis et al., 2002). Although there is not much flexibility in reporting quantitative financial data, there is flexibility in the construction and presentation of the accompanying narratives "to 'spin' the results to its favor and to moderate investor reactions to the quantitative financial information" (Riley et al., 2014, p. 62). Consequently, and in addition to accounting literature on quantitative financial data, extant research has analyzed how the narrative, which is typically published together with the quantitative financial data (Riley et al., 2014), influences decision-making. Previous studies investigated the role of financial press releases (Davis and Tama-Sweet, 2012), annual reports (Feldman et al., 2010) and the initial capital letter (Yuthas et al., 2002). Such research examines the influence of the composition of financial narratives (e.g. the choice of metaphors (Walters-York, 1996)) on economic decisions and confirms that the way financial reports are written can have effects on economic decision-making (Merkl-Davies and Brennan, 2007). In short, previous literature on discursive performativity of accounting recognizes that the use of language in financial reports does more than representing quantitative information. It takes part in the symbolic reproduction of the economic reality in which a corporation operates (Sandell and Svensson, 2016). Thereby, accounting narratives can influence economic perspectives and behavior.

However, the effects of language in the field of accounting have not yet been analyzed sufficiently, particularly in the context of social accounting. Moreover, the debate about language in accounting focuses almost exclusively on narratives in reports and, thus, the result of the accounting process (Merkl-Davies and Brennan, 2007; Riley et al., 2014), while paying little attention to the effects of language in accounting calculations. The article at hand extends this research by investigating the effects of the terminology used for single accounts on economic decision-making and expects that the vocabulary used in accounting systems (for the same accounting terms) will have an effect on company internal decision-making. By examining these effects, our research focuses not on the narratives as written texts (such as financial reports and press releases). Instead, we focus on the effects of the terminology used for specific accounts, which has not been researched so far.

Thereby, we pick up various research needs articulated by stakeholder theory and sustainability accounting research. First, as described in the introduction, VCA attempts to implement a key element of stakeholder theory, i.e. the integration thesis (Freeman et al., 2010), to accounting. It thereby aims at dealing with ethical and business dimensions of decisions in an integrated manner. Second, stakeholder theory defines the purpose of business as value creation for stakeholders (Freeman et al., 2010; Hörisch et al., 2014). However, current accounting is criticized for focusing too strongly on financial profits and, thus, on value creation for one group of stakeholders, i.e. financiers (Hall et al., 2015;

Harrison and van der Laan Smith, 2015). Therefore, from a stakeholder theory perspective, the question arises, in how far language can help to broaden the focus of current accounting practices and put emphasis on value creation for additional stakeholders (Mitchell et al., 2015; Schaltegger et al., 2017). In this research, we focus on employees as an additional stakeholder group to be accounted for, as employees are primary stakeholders of central importance for nearly all businesses (Freeman et al., 2010) and highly relevant for corporate sustainability (Thomsen and King, 2009). An additional emphasis is put on decision-making in times of financial shortage, as negative social consequences are frequently expected to be triggered by such circumstances (Evans and Tzavara, 2012; Heras-Saizarbitoria et al., 2016; Zengin, 2010).

2.2 Development of hypotheses

Accounting can be viewed as a system that translates all processes that affect the economy into the quantitative language of business. Building financial terms and financial indicators allows to view and treat different factors as something similar (Chiapello, 2015). Chiapello (2015) argues that after an economic process has been "translated" into the categories of accounting, the economic dimension of the process is the main concern while social and political aspects are left behind. This implies an economic pattern of interpreting accounting information, which focuses the attention of decision makers on increasing profits for shareholders, while paying less attention to the qualities of goods and services (Sombart, 2001), which are likely to be relevant for further stakeholders (Hörisch et al., 2014; Schaltegger et al., 2017). Therefore, it can be expected that using conventional accounting tools, decision makers give higher priorities to cost reductions, which directly increases profits for shareholders. Accordingly, Hopwood (1992, p. 136) ascribes accounting the capability "of making the organization more economically orientated than it otherwise might have been." This may distract attention from other relevant concerns, such as the quality of the products and services or social demands of the stakeholders involved in an activity, and can thus mitigate the willingness to invest in addressing these concerns.

However, earlier research suggests that ensuring quality of products and services as well as creating benefits for stakeholders can require upfront investments (Porter and Kramer, 2006, 2011; Freeman et al., 2010). Porter and Kramer (2011), for example, argue that while it is possible to simultaneously create value for the company as well as for its stakeholders, this frequently requires prior expenditures, and that the willingness to do such expenditures is frequently missing. Similarly, stakeholder theory posits value creation as the key purpose of business, and stakeholder theorists also argue that to create value for all stakeholders involved in a business, frequently upfront expenditures are required (Freeman et al., 2010; Hörisch et al., 2014).

Mitchell et al. (2015) emphasize that a new vocabulary in accounting is relevant, to enlarge the scope of stakeholders considered in accounting. Similarly, Schaltegger et al. (2017) suggest that to inspire companies to follow the objective of creating value for all stakeholders, new narratives and new vocabulary are needed to describe business activities. In so doing, they explicitly refer to the alternative terminologies used in VCA. It can, thus, be assumed that more stakeholder- and value-oriented vocabularies in accounting increase the importance decision makers assign to expenditures. By contrast, with regard to conventional accounting tools, it can be expected that such tools focus the attention of the user through an emphasis on (financial) results (Hopwood, 1992), which can result in a focus on cost reductions. This research consequently suggests that the vocabulary used in accounting influences decision makers' willingness to make expenditures and to reduce costs. Therefore, we postulate the following first set of hypotheses:

H1a. When compared to the conventional accounting language, the language used in VCA leads to lower reductions in costs.

H1b. When compared to the conventional accounting language, the language used in VCA leads to higher expenditures than conventional accounting.

Using a stakeholder theory perspective, Freeman et al. (2010) problematize the artificial separation of ethical dimensions and economic dimensions of business decisions. Similarly, in the context of accounting, Chiapello (2015) points out that the objects of accounting perform a reality that "disembeds" economic perspectives from social and political perspectives. This means that economic (financial) effects of a decision are formally separated from its social and political effects. Following Chiapello (2015), in conventional accounting, it is only important and "real" what can be measured financially. Thus, the practices and methods of conventional accounting separate economic aspects from other dimensions of reality while creating an autonomous sphere. Although the behavior in markets is, among other factors, influenced by social aspects, such as personal relationships of market participants, conventional accounting tools direct the attention of its users specifically to the economic dimension of the processes. Thereby, such tools support a rational, financial perspective on economic processes and, particularly, social impacts are not taken into consideration prominently (Chiapello, 2015). Frequently, it is expected that such disregard paid to social aspects is particularly noticeable in times of financial shortage, as companies tend to focus on economic aspects under such circumstances and to rather disregard aspects related to corporate social responsibility and sustainability (Evans and Tzavara, 2012; Heras-Saizarbitoria et al., 2016; Zengin, 2010).

Further, Chiapello's (2015) argument that conventional accounting systems disembed the economic perspective suggests that the ability to take a wider perspective and to recognize social aspects is influenced by the design of accounting tools. This expectation is also fostered by previous findings that the language used to present information can influence decision-making (Costa et al., 2014; Bhattacharya et al., 2007; Francis et al., 2002). In line with this research, Mitchell et al. (2015) suggest that a new vocabulary in accounting is needed, to enlarge the scope of stakeholders considered in accounting. More specifically, Schaltegger et al. (2017) draw on the example of the terminology VCA uses for staff costs (i.e. employee income) and argue that using such terminology will emphasize the role of employees in creating value. Thus, based on previous research on accounting from a stakeholder theory perspective, it can be expected that the language used in accounting systems influences decision-making, particularly with regard to employees. As earlier research highlighted that negative social consequences are frequently expected to be triggered by financial shortages (Evans and Tzavara, 2012; Heras-Saizarbitoria et al., 2016; Zengin, 2010), H2 addresses decision-making regarding staff costs in times of financial shortage. Hence, H2 is formulated as follows:

H2. When compared to the conventional accounting language, the language used in VCA leads to lower reductions in employee income/staff costs in times of financial shortage.

While we expect in H1a, H1b and H2 that decision makers will decide differently depending on the wording used to describe a given situation, it could be the case that sensitivity to language cues in accounting varies between different groups of individuals. Evans et al. (2015), for example, point out that different groups of individuals (e.g. students, members of different professional groups) have a different understanding of language wording. Likewise, Krome (2016) documented that men and women may react differently to different language clues. She, for example, found that women rate study programs which are advertised with gender-neutral wording or feminine wording more attractive than men and more attractive than advertisement drawing on masculine wording.

Earlier research also found that women differ from men in the importance they ascribe to different values (Shoham et al., 1998; Keng and Yang, 1993; Kahle, 1996). By comparing women's preferences for specific values to men's preferences for the same values, Shoham et al. (1998) observed that women value warm relations with others more than men. Based on the personality traits theory, multiple authors confirm that females are, by tendency, more altruistic than men (Feingold, 1994; Costa et al., 2001). Furthermore, Milfont and Sibley (2016) argue that women are frequently socialized to be more empathic and other-focused than men.

In the context of accounting, Haynes (2016) argues that women have been more likely than men to be excluded or oppressed from accounting, and that the logic of (conventional) accounting presents the value set of the "universal masculine". Indeed, many studies have dealt with differences between masculine and feminine values, which also inform accounting (Bourdieu, 2001; Cooper, 1992) and which emphasize that feminine and masculine views are not restricted to sexuality, but are symbolized in all forms of expressions, social relations and organizations (Cooper, 1992). The masculine view is described as unitary, linear and to be concerned with domination, power and goals. In contrast, the feminine view is frequently considered to be plural, circular and concentric as well as to be concerned with value creation (Hines, 1992). Taking a feminist accounting perspective, Cooper and Senkl (2016, p. 512) appeal to consider strategies for "changing the symbolic order into something more feminine." VCA can be one attempt to support such feminine view, by using a more value-oriented language in accounting. Based on the finding that men and women may react differently to different kinds of language, that women tend to score higher with regard to pro-social values and that conventional accounting language is expected to stem from a masculine view, we expect that women are more receptive to the language clues provided by VCA. Thus, we formulate the following hypotheses:

H3a. The effect of using a VCA language on cost reduction decisions is stronger among female decision makers.

H3b. The effect of using a VCA language on expenditure decisions is stronger among female decision makers.

H3c. The effect of using a VCA language on decisions concerning the reduction of employee income/staff costs in times of financial shortage is stronger among female decision makers.

3. Material and methods

3.1 Procedure

To test the hypotheses proposed, a survey-based experiment drawing on two different scenarios was conducted in April 2016. We chose to conduct an experiment, because research shows that an experiment allows to control external influences, such as firm attributes, past performance and the total number of terms in the accounting calculation (Riley et al., 2014). Thus, we are able to isolate language design of accounting calculations as the source of the observed change. To avoid any bias because of questionnaire allocation, the scenarios were randomly allocated to the participants. In each scenario, information about a fictive trading company and a management accounting calculation for one supermarket of that company were provided to the participants. In the first scenario, the participants were provided with information using VCA language. In the second scenario, the information was provided using the vocabulary of conventional accounting (i.e. direct costing). In line with Bardsley (2000), participants were not informed that the survey was fictional. It is assumed that thereby the measured results are more realistic.

In the experiment, the participants take the role of the store manager of a supermarket and face the tasks to make expenditures and reduce costs with regard to given categories, such as staff, advertisement or cleaning (for all categories, see Appendix 1). The role of store managers was chosen for the experiment, as the introduction of VCA in a company is usually decided upon by top management (e.g. the CEO) to nudge the decisions of middle managers (in case of this article, store managers) to focus more on social rather than financial aspects. As a reference point, the participants were provided with the accounting calculation of the previous month. For both scenarios, the content of the calculations (i.e. the numbers provided for the spending of past month) and the description of the company were the same. However, the evaluation of Scenario 1 was phrased using a "value-oriented" language design, following the best practice approach for VCA of Alnatura, while Scenario 2 used a conventional accounting language design (both scenarios and the related tasks are displayed in the appendix). In two subsequent tasks, the participants had to make different financial decisions (e.g. expenditures or cost reductions). In Task 1, the participants were asked to plan expenditures and cost reductions based on the information provided in the respective scenario allocated to them (conventional accounting vs VCA). The participants could decide freely, including decisions to not change expenditures. Task 2 asked the participants to make decisions in times of crisis, i.e. an unanticipated shortage of financial resources. In this task, participants chose, among other aspects, the level of reductions or increases in staff costs (or respectively employee income). After reading the scenarios and solving the tasks, the participants were asked to fill out a questionnaire, to gain information on demographic and control variables.

3.2 Participants

The participants in this survey-based experiment were undergraduate students at a German university. The students were enrolled in a general business program and chose an elective in accounting. This selection of participants made sure that each participant had at least a basic understanding of accounting. The choice of a student sample is meaningful in this specific context of decision-making in a business, as business students are future decision makers in the situation of interest for this study. Additionally, in experimental research, choosing a student sample helps to create homogeneity within the sample, which maximizes control and internal validity (Thomas, 2011; Walker and Willer, 2007). The respondents were informed that participation was voluntary, and that no sanctions would apply in case of non-participation. The experiment was conducted in German. Of the 179 responses, 17 (H1a, H1b, H3a and H3c) or respectively 19 (H2 and H3c) needed to be excluded for the analyses due to missing data in the questionnaires. The main characteristics of the final sample are summarized in Table II.

Appendix 2 provides an overview of the descriptive statistics differentiated by scenario and provides t-tests and chi2-tests to document that the two subsamples do not differ with regard to the control variables.

Table II. Descriptive statistics of the sample

	N	Mean	SD	Min.	Max.
COMPLEX	162	4.961	1.355	1.33	7
RISK	171	4.589	0.970	2	7
COST REDUCTIONS	171	6.780	2.081	0	10.17
EXPENDITURES	171	6.885	2.335	0	10.335
STAFF	169	-1,109.468	1,572.305	-8,000	2,000

	Count	%
Gender		
Female	81	47.40 %
Male	90	52.60 %
Scenario		
VCA	83	48.50%
Conventional accounting	88	51.50%

The missing values (N<179) stem from participants who did not fill out a task completely. The different values for N concerning the variable STAFF on the one hand and COST REDUCTIONS and EXPENDITURES on the other hand can be explained by the fact that the variables refer to different tasks.

3.3 Measures

To capture the effects of language, the two groups provided with either information using conventional (SCENARIO = 0) or VCA vocabulary (SCENARIO = 1) were differentiated using a dummy variable. To measure the participants' willingness to make expenditures and to reduce costs, the sum of expenditures (EXPENDITURES) and respectively the sum of cost reductions (COST REDUCTIONS) in Task 1 were measured. During the task, the participants were requested to plan expenditures and cost reductions for the given scenario based on their own assessment. We used willingness to reduce costs and make expenditures as dependent variables to assess H1a and H1b, respectively, as they seriously affect the company and its shareholders as well as further stakeholders and expenditures are frequently considered to be a prerequisite for realizing shared value for the company and its stakeholders (Porter and Kramer, 2006, 2011; Schaltegger et al., 2017).

To determine in how far the respondents took social aspects in times of financial shortage into account, the decisions in Task 2 were evaluated. Task 2 measured the change in spending for staff costs or respectively employee income (STAFF) in times of financial shortage. Spending for staff is analyzed because this is a position with which decision makers can directly influence the employees as important stakeholders of the company. To capture the influence of gender, the participants indicated whether they are male (GENDER = 0) or female (GENDER = 1). In addition to the mentioned tasks, three items were included in the questionnaire to assess the complexity of the tasks being processed. This serves to control for possible effects of the difficulty of the tasks and the comprehensibility of the given scenarios for decision-making. Using a seven-point rating scale (ranging from “strongly disagree” to “strongly agree”), the participants were asked to indicate for each item how strongly they agree with the respective statement on the complexity of the tasks and the scenarios (see Appendix 1 for the exact wording of the items). For these three items, the average score was calculated to create a single construct for complexity of the scenarios (COMPLEX). Calculating Cronbach’sa confirmed the reliability of this construct (Cronbach’s a = 0.823) as the critical value of 0.7 is clearly exceeded.

Because risk propensity can affect business decision-making (Hung and Tangpong, 2010), the respondents were additionally asked to assess their willingness to take risks (RISK). Based on three items on risk taking, each using a seven-point rating scale ranging from “strongly agree” to “strongly disagree”, an average score was calculated. Again, a Cronbach’s a of 0.788 confirmed the reliability of this construct. For the assessment of the willingness to take risks, we modified items of the study of Hung and Tangpong (2010), which were based on Jaworski and Kohli (1993).

To ensure that standard errors and the data for the interval-scaled variables are normally distributed, normal distribution of the variables EXPENDITURES, COST REDUCTIONS, STAFF, COMPLEX and RISK as well as of the standard errors was tested using histograms and QQ-Plots. As a consequence, the variables EXPENDITURES and COST REDUCTIONS were logarithmized to approach normal distribution.

4. Results

To test the hypotheses, analyses of variance (ANOVAs) were conducted, using SPSS 24. In the ANOVAs, GENDER and SCENARIO were entered as fixed effects, whereas RISK and COMPLEX were entered as covariates. In H1a, we expected that compared to conventional accounting language, the language used in VCA leads to lower reductions in costs. To test this hypothesis, an ANOVA was set up, including the main effect of conventional and value-oriented language choice (SCENARIO) on COST REDUCTIONS as well as the main effects of GENDER and of COMPLEX and RISK. As can be seen in Table III (Model 1), SCENARIO indeed has a significant influence on COST REDUCTIONS, i.e. the language used in accounting tools significantly influences the degree of cost reductions chosen. As hypothesized, a Bonferroni post hoc test confirms that decision makers using conventional accounting indeed choose significantly ($p < 0.01$) higher average levels of cost reductions than decision makers using VCA. H1a is thus confirmed. None of the control variables has a significant influence on COST REDUCTIONS in this model.

Table III. ANOVA on *H1a* and *H3a*

	Model 1		Model 2	
Independent Variable	**F**	**Part. η²**	**F**	**Part. η²**
Constant term	61.969**	0.283	67.775**	0.303
SCENARIO	8.439**	0.051	8.878**	0.054
GENDER	0.068	0.000	0.030	0.000
COMPLEX	0.912	0.006	1.589	0.010
RISK	0.117	0.001	0.263	0.002
SCENARIO*GENDER			5.250*	0.033
Model Fit (adj. r²)	0.029		0.054	
N	162		162	
Bonferroni-post-hoc p	0.004		0.003	
Mean for SCENARIO = 1 (Bonferroni corrected)	6.301		6.327	
Mean for SCENARIO = 0 (Bonferroni corrected)	7.252		7.289	

Dependent variable: COST REDUCTIONS

** p<0.01; *p<0.05

In H1b, we assumed that when compared to conventional accounting language, the language used in VCA leads to higher willingness to make expenditures. Model 1 in Table IV documents that SCENARIO does not exert a significant influence on EXPENDITURES. Consequently, we cannot confirm H1b.

Table IV. ANOVA on *H1b* and *H3b*

	Model 1		Model 2	
Independent Variable	**F**	**Part. η²**	**F**	**Part. η²**
Constant term	49.894**	0.241	46.911**	0.231
SCENARIO	0.112	0.001	0.120	0.001
GENDER	3.317	0.021	3.186	0.020
COMPLEX	2.099	0.013	1.755	0.011
RISK	0.027	0.000	0.051	0.000
SCENARIO*GENDER			0.403	0.004
Model Fit (adj r²)	0.010		0.009	
N	162		162	

Dependent Variable: EXPENDITURES

** p<0.01; *p<0.05

With regard to the consequences accounting decisions have for employees in times of financial shortage, in H2, it is argued that when compared to conventional accounting language, the language used in VCA leads to lower reductions in employee income/staff costs. To test this hypothesis, the variable STAFF (i.e. the change in staff costs or respectively employee income in times of financial shortage) derived from Task 2 was used as the dependent variable in an additional ANOVA (Table V). The significant influence of the variable SCENARIO in Table V (Model 1) displays that the wording chosen (i.e. VCA or conventional accounting wording) indeed impacts the amount of reductions in staff costs. Bonferroni's post hoc test confirms H2, as it reveals that in times of financial shortage, the cuts in staff costs conducted in the conventional accounting scenario (1,450.746) are indeed significantly higher ($p < 0.01$) than those in the VCA scenario (574.578). None of the further variables included in the model shows significant effects.

Table V. ANOVA on *H2* and *H3c*

	Model 1		Model 2	
Independent Variable	**F**	**Part. η²**	**F**	**Part. η²**
Constant term	0.013	0.000	0.027	0.000
SCENARIO	15.203**	0.089	15.050**	0.089
GENDER	0.177	0.001	0.105	0.001
COMPLEX	2.517	0.016	3.388	0.022
RISK	0.315	0.002	0.477	0.003
SCENARIO*GENDER			3.721	0.024
Model Fit (adj r²)	0.100		0.115	
N	160		160	
Bonferroni-post-hoc p	0.000		0.000	
Mean for SCENARIO = 1 (Bonferroni corrected)	574.578		564.947	
Mean for SCENARIO = 0 (Bonferroni corrected)	1450.746		1429.455	

Dependent variable: STAFF

To test H3a, H3b and H3c, the interaction effect of GENDER and SCENARIO was added to the ANOVAs. Model 2 in Table III reveals that GENDER significantly moderates the effect of SCENARIO on COST REDUCTIONS. Figure 1 displays the interaction effect of GENDER and SCENARIO on COST REDUCTIONS. It reveals that the effect of SCENARIO (i.e. the language used in accounting tools) on COST REDUCTIONS is greater among female than among male decision makers. Hence, H3a is confirmed. In contrast, the interaction effect of SCENARIO and GENDER does not exert a significant influence on EXPENDITURES (Table IV; Model 2) or reductions in staff costs in times of financial shortage (STAFF; Table V Model 2). Hence H3b and H3c cannot be confirmed.

The perceived complexity of the tasks does not exert a significant influence in any of the models tested. Likewise, no substantial differences could be observed regarding the perceived complexity of the tasks between VCA and the conventional accounting scenario (mean complexity VCA = 4.680; mean complexity conventional accounting = 5.216; see also Apendix 2). Therefore, the analysis provides no indication that decisions of individuals who found the task more complex differ from those who found the tasks relatively easy. Thus, the differences observed between the two groups can indeed be ascribed to the difference in the language used to provide the information, not due to different levels of perceived complexity of the respective task or misunderstandings regarding the VCA terminology.

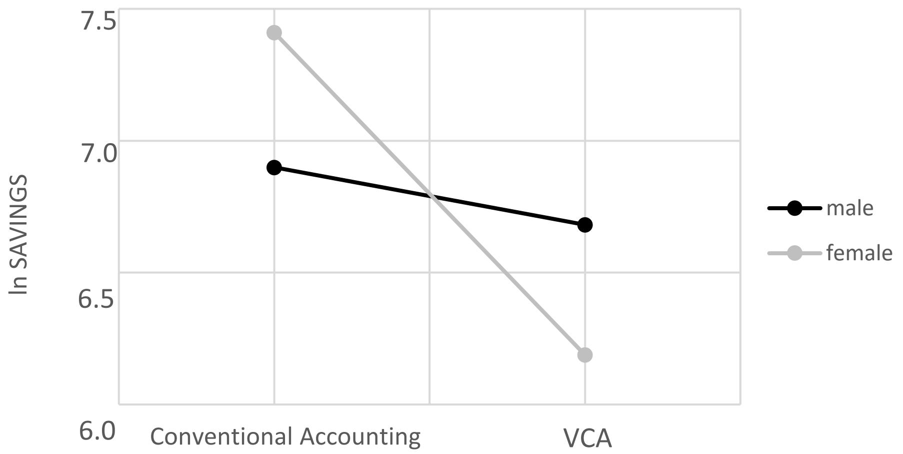

Figure 1. Interaction effect of GENDER and SCENARIO and GENDER on COST REDUCTIONS

5. Discussion and conclusions

Various studies showed how accounting becomes institutionalized by society and thus creates and recreates social reality (Hines, 1988, 1991). In this context, previous research analyzed effects of a number of linguistic characteristics of accounting narratives in documents such as press releases and investors reports (Davis and Tama-Sweet, 2012; Feldman et al., 2010). However, only little attention has previously been paid to the effects of language use in accounting tools. The given study extends and complements prior research by analyzing the terminology used for specific accounts. To this end, it examined and compared the effects of value-oriented and conventional language design of accounting calculations on the willingness to make expenditures and cost reductions as well as the priority ascribed to social aspects, such as preventing cuts in expenditures for employees in times of financial shortage.

The results reveal that the wording of accounting terms in financial calculations indeed exerts significant influences. More specifically, the findings demonstrate that decision makers who base their decisions on information using a value-oriented language (i.e.

using VCA) chose smaller cost reductions than participants provided with information in conventional accounting language. Additionally, decision makers informed on the basis of VCA language reduced expenditures for staff in times of financial shortage to a significantly smaller degree than decision makers informed based on conventional accounting language. Thus, our results also reveal the implied costs that managers will have to face when using VCA, i.e. potentially higher costs for value creating factors, as, for example, income of employees in times of financial shortage. This can also come along with unforeseen (and potentially unintended) consequences, as the decrease in cuts with regard to employee costs need to be compensated for by cuts with regard to other accounts.

Furthermore, our results concerning the influence value-oriented language has on cost reductions highlight that this effect is particularly strong among female decision makers. This provides indication for the assumption that female decision makers are more receptive to the language change coming along with the adaptation VCA provides to conventional accounting tools. The language design of VCA aims at supporting a stakeholder sensitive view, where there is no qualitative difference between one's own value creation and the values created by others. Cooper and Senkl (2016) describe this view as the feminine economy. Thus, our findings contribute to earlier research, which argued that conventional accounting reinforces structures of the so-called male economy that differentiates between (good) self and (bad) other and is argued to reflect rationalism and egoism (Cooper, 1992). In contrast, the language design used in VCA can help to also reflect so-called "feminine values". This language does not focus on the separation between good (profits) and bad (costs) accounting positions, but on the value created from a stakeholder perspective.

Thus, the results on cost reductions, spending for staff costs in times of financial shortage and the results concerning gender highlight that language can influence a business decision. We found indication that through the specific language of conventional accounting, a financially oriented perception of reality and rational action can be promoted. The investigated social aspect of employee income in times of financial shortage seems to be only of secondary importance in conventional accounting and is downgraded in priority not only because of the quantification of the economic reality, but also because of the specific language used in accounting tools. Even if the main characteristic of VCA investigated in this research is only a renaming of conventional accounting terms, previous research showed how powerful language can be and what influence it can have on the construction of reality (Hines, 1988). This is confirmed by our findings, which show the influence of language of accounting tools on decision-making in businesses. The relevance of these findings is also substantiated as accounting decisions have wider social implications beyond the financial ones. For example, the decision to cut employee costs leads to lower incomes for people (employees).

Thus, our study indicates that the language of accounting instruments can not only influence specific decisions within businesses, but can generally influence the construction of reality by effecting behavior. It, thus, follows the appeal of Hines (1988) that the influence of an accounting instrument should be examined regarding its impact on society, rather than being accepted without reflection of possible consequences. Our findings are also in line with Costa et al. (2014), who elaborated on how language can influence the rationality of decision-making (e.g. in dependence on whether the description of the situation was provided in a foreign language or in the respondents' mother tongue). As in the study by Costa et al. (2014), the given study found a change in the rationality of behavior as a function of language design.

A possible explanation for the effects of using VCA is that the linguistic terms of conventional accounting promote the quantification and monetization of processes that initially contain qualitative factors, such as social aspects. In so doing, conventional accounting tools emphasize the direct monetarily measurable effects of an economic process. Social aspects (such as the needs of employees) are downplayed by this technical-economic language. In contrast, the value-oriented language used in VCA aims to emphasize consequences for social value creation and, thus, also social aspects of decision-making. Therefore, value-oriented language intends to promote multiperspectivity on economic processes, whereas conventional language describes processes with a stronger emphasis on the economic perspective. Interestingly, both, economic theory and economic practice, use similar or the same vocabulary as conventional accounting, as this kind of language originated in the context of accounting: Terms like "cost", "capital", "assets" and "revenue" were initially served by the discourse of the merchants and bankers, who were themselves fed by the categories of accounting (Chiapello, 2008).

With regard to stakeholder theory, our results confirm the conceptually derived expectations from stakeholder theory research (Mitchell et al., 2015; Schaltegger et al., 2017) that language has an effect on how different stakeholders are considered in decision-making. As emphasized in stakeholder theory literature, employees and their needs are important factors influencing the economic success of a company (Schoorman et al., 2007; Cravens and Oliver, 2005). It is a decisive criterion whether decision makers exclusively take an economic perspective or also consider the (social) effects a decision has for employees (Skinner and Spurgeon, 2005). The analysis showed that the language design of accounting instruments can directly influence economic decision-making and can, thus, have far-reaching consequences for stakeholders, such as employees. In our analysis, the participants prioritized social aspects to a stronger degree if VCA was used (i.e. value-oriented language design), than if the language of conventional accounting was used. Thus, the study confirms conceptual considerations from stakeholder theory that a new vocabulary can help to sensitize decision makers for the question of who is affected by and who creates economic success for a company (Mitchell et al., 2015; Schaltegger et al., 2017). Various environmental management accounting frameworks and tools for analysis exist, such as integrated reporting (Thomson, 2015), that have similar aims than VCA with regard to representing value creation for further stakeholders. Like integrated reporting, VCA is not meant to be an addition, but a substitute to existing, conventional accounting systems. It, thus, aims at replacing conventional accounting and is meant to be used as the primary tool for decision-making. However, in contrast to integrated reporting, VCA is not a tool for external reporting, but serves to inform internal decision-making. Additionally, previous studies criticized the integrated reporting concept to be a limited approach that fails to ensure accountability for all stakeholders (Thomson, 2015; Adams, 2015).

Besides the implications and insights this study offers, some limitations of the present study also need to be mentioned. First, the findings of this article do not imply the superiority of either of the accounting tools researched. Whether the advantages of conventional accounting and VCA outweigh the respective disadvantages depend on the aims and the philosophy of the particular organization applying these tools. If an organization aims at considering additional stakeholders as suggested by stakeholder theorists (Mitchell et al., 2015; Harrison and van der Laan Smith, 2015), our results indicate that the adaptation VCA provides to conventional accounting is an effective approach. To weigh the pros and cons of such aim (given the specific circumstances and purposes of an organization) is beyond the scope of this research.

As a second limitation, data were collected using a student survey. Thus, the sample is not representative. Additionally, the understanding of accounting the participants of this experiment have might not be enough to justify such a serious strategic decision-making mapped out in the scenario. On the other hand, the participating students will likely hold similar positions as assumed in the experiment in future and will have to make similar decisions after graduating. Additionally, using the selected sample allows increasing homogeneity within the sample and, thus, optimizes control and internal validity of the results, which is why this procedure is often chosen in experimental research (Walker and Willer, 2007; Thomas, 2011), particularly in new research fields (Rack and Christophersen, 2007).

Third, although the given study has presented first results on the effect of language wording of accounting terms, Evans et al. (2015) point out that different groups of subjects (e.g. students, members of different professional groups) have a different understanding of language wording. This provides room for future research to investigate how different groups of accountants react to the change of language design, particularly as this article found different reactions among female and male decision makers. However, as our results also showed that women are not generally more receptive to language cues than men, future research could also further specify for which aspects of decision-making language cues show stronger effects among females and explore the underlying reasons for these differences (and lack of differences). Similarly, earlier research showed that individuals react differently to different language clues in dependence on whether such clues are provided in their mother tongue (Costa et al., 2014). This aspect could not be tested in this research, as the sample nearly exclusively draw on participants with German as their mother tongue. However, future research should test the effects of VCA in different and more diverse language settings.

Fourth, it should be noted that changing the vocabulary in accounting may lead to direct, indirect, short- and long-term changes. However, our study, as a first step, only investigates direct, short-term effects on decision-making. Future research should address the long-term effects, using longitudinal, qualitative case studies or quantitatively examining panel data on the effects of language wording in the field of accounting and elaborate the reasons behind the change in decision-making.

Fifth, we have only analyzed a very small aspect of potential consequences of decision-making in accounting, as we focus on the financial aspects of value creation. However, as highlighted in stakeholder theory (Schaltegger et al., 2017; Harrison et al., 2010), businesses create a full range of values, including social or environmental value creation (or destruction). Similarly, we have only analyzed the effects for one additional group of stakeholders, i.e. employees. Further research should extend the scope of this study to include more groups of stakeholders and also investigate non-financial aspects of a company's value creation, as well as further financial aspects relevant for the respective stakeholders (such as expenditure for employee training). Such future research should also analyze potential unintended effects, by analyzing more closely which other accounts (and potentially which other stakeholders) are negatively affected by the decrease in cuts of employee costs, as such decrease needs to be compensated for by increases in cuts with regard to other stakeholders.

Sixth, in this study, we only tested one possible scenario of financial shortage (i.e. loss of a loan). However, financial shortage can have several reasons (i.e. loss of a loan, decline in sales). We did not test for the effects of other possible reasons for financial shortage on decision-making.

Seventh, the scenario is not completely realistic, especially because supermarkets in most countries cannot dismiss employees within a month. However, the absence of full realism was necessary to study the tasks within the experimental design. Future repetitions of this experiment should use financial data on a yearly basis instead of financial data on a monthly basis to make the experiment more realistic.

Eighth, the (qualitative) reasons behind the decision-making and the way how VCA influences perception of accounts were not captured in this experiment. Further research should address this issue with qualitative case studies.

Lastly, as our results show that the language of accounting can have far-reaching consequences for decision-making, further research questions need to be addressed such as who decides which accounts are described by which term and who is meant to benefit from the change in accounts. It also needs to be elaborated, whether the altered names also change the perception of stakeholders on certain decisions and whether the change in vocabulary shifts power fromthe manager to the accountant.

Notwithstanding these limitations and needs for further research, the present study indicates that in the field of accounting, language can significantly influence decision-making processes in various ways. Such influence is largely ignored in accounting research and practice. Therefore, language seems to exert a hidden power in accounting, particularly with regard to cost reductions and social decisions. The study suggests that the specific language of an accounting calculation should be chosen carefully and with awareness for the possible effects on cost reduction decisions as well as on social consequences, to take its hidden power into account.

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Appendix 1

Description of Tasks (Translated to English)

Task 1:
As the store manager, it's your task to plan your investment and cost reductions for the coming month (April 2016): Where do you want to invest, where do you want to reduce costs? Please enter the amount of cost reductions and investment that you want to save or invest in the empty fields of the table "Task 1". Just leave all other fields blank, for categories concerning which you do not want to change anything compared to the previous month. Decide instinctively. What cost reductions and investments do you think make sense?

Task 2: One day after completing your plan, you learn that a long-term loan is suddenly over and you need to reduce costs by € 33,000 in the coming month. You can reduce costs for goods by € 25,000. Where do you plan to reduce the additional costs (€ 8,000)? Please enter the respective amount you want to reduce in table "Task 2". Decide instinctively.

Description of Scenarios (Translated to English)

Scenario 1:
As an appendix you find the value creation accounting (VCA) of your supermarket for the month of March 2016. In the first block (line 1-23) you find your value calculation, which includes all services provided by your supermarket, your company and by external companies (for example, good purchases, consultancy services, employee incomes). The value calculation consists of the purchase of goods (line 1-3), the services provided by external companies, so-called external services (line 4-15), and the services of your supermarket, so-called own services (line 16-22). In line 25, you find the sales generated by your supermarket (net sales). The difference between services rendered and turnover is shown in line 24 (income). If you do not understand a term in the VCA, please carry out the tasks anyway. The first column shows the actual values of the previous month (March 2016). In the second column, you can find the values for the previous month in 2015 (March 2015) for comparison purposes. Next to this, you see the change in percentage points.

Scenario 2:
As an appendix, you find the direct costing for your supermarket for the month of March 2016. In the first line (1) you find the turnover generated by your branch (net). The following lines (line 2-23) show all costs incurred (for example, cost of goods sold, consultancy costs, staff costs) and deducted from sales. As an interim result, you will find the so-called gross income in line 4 and the so-called "cover contribution I and II" in lines 6 and 22. Line 24 shows the calculated profit for your branch, which is calculated by comparing the revenue generated (line 1). All costs incurred (line 2-23) are deducted. If you do not understand a term in the calculation, please carry out the tasks anyway. The first column shows the actual values of the previous month (March 2016). In the second column, you can find the values for the previous month in 2015 (March 2015) for comparison purposes. Next to this, you see the change in percentage points.

Measures of complexity (Items translated to English)

- I got along with the terms used in [direct costing/value creation accounting] well.
- I think [direct costing/value creation accounting] is difficult to understand and complicated. (reversely coded)
- I directly understood all the terms used in [direct costing/value creation accounting].

Measures of risk (Items translated to English)

- I like opportunities, even if they can involve a risk.
- If I have to make a decision with unknown consequences, I prefer to choose the safer option, even if it results in less profit. (reversely coded)
- To achieve higher levels of profit, I willingly accept higher levels of risk.

Scenario 1:

	Month			Your Plan (for April 2016)	
	March 2016	March 2015	Change	Task 1 in €	Task 2 in €
Goods	245.600 €	234.800 €	4,4%		-25.000 €
Stock differences	550 €	600 €	-9,1%		
Total Goods used	246.150 €	235.400 €	4,4%	x	x
Customer communication	14.400 €	11.500 €	20,1%		
Money transport	2.700 €	2.700 €	0,0%		
Security and detective agency	1.400 €	1.500 €	-7,1%		
Telecommunication and postage	750 €	800 €	-6,7%		
Maintenance	2.500 €	1.300 €	48,0%		
Energy	11.000 €	11.200 €	-1,8%		
Cleaning performance	3.900 €	3.400 €	12,8%		
Consumables	1.800 €	1.500 €	16,7%		
Disposal	800 €	700 €	12,5%		
Insurances	700 €	700 €	0,0%		
Other external services	300 €	400 €	-33,3%		
Total external services	39.950 €	35.300 €	11,6%	x	x
Employee income	53.500 €	49.000 €	8,4%		
Employee recruitment	1.200 €	1.300 €	-8,3%		
Traveling performance	1.800 €	1.300 €	27,8%		
Employee training	2.500 €	2.200 €	12,0%		
Rent and lease	12.700 €	12.700 €	0,0%		
Fee for investments	7.000 €	6.900 €	1,4%		
Total personal contribution	78.700 €	73.400 €	6,7%	x	x
Total value creation	364.800 €	344.100 €	5,7%	x	x
Debt relief / Debt	25.300 €	5.600 €	77,9%	x	x
Sales (net)	390.100 €	349.700 €	10,4%	x	x

Scenario 2

	Month			Your Plan (April 2016)	
	March 2016	**March 2015**	**Change**	**Task 1 in €**	**Task 2 in €**
Sales (net)	390.100 €	349.700 €	10,4%	x	x
Cost of goods	245.600 €	234.800 €	4,4%		-25.000 €
Cost of inventory differences	550 €	600 €	-9,1%		
Gross profit	143.950 €	114.300 €	20,6%	x	x
Staff cost	53.500 €	49.000 €	8,4%		
Contribution margin I	90.450 €	65.300 €	27,8%	x	x
Advertising cost	14.400 €	11.500 €	20,1%		
Cost of money transport	2.700 €	2.700 €	0,0%		
Cost for security and detective agency	1.400 €	1.500 €	-7,1%		
Costs of employee training	2.500 €	2.200 €	12,0%		
Telecommunication and postage costs	750 €	800 €	-6,7%		
Maintenance costs	2.500 €	1.300 €	48,0%		
Energy costs	11.000 €	11.200 €	-1,8%		
Cleaning costs	3.900 €	3.400 €	12,8%		
Cost of consumables	1.800 €	1.500 €	16,7%		
Disposal costs	800 €	700 €	12,5%		
Costs for employee acquisition	1.200 €	1.300 €	-8,3%		
Traveling expenses	1.800 €	1.300 €	27,8%		
Depreciation	7.000 €	6.900 €	1,4%		
Costs for insurances	700 €	700 €	0,0%		
Other external costs	300 €	400 €	-33,3%		
Contribution margin II	38.000 €	18.300 €	51,8%	x	x
Room costs	12.700 €	12.700 €	0,0%		
Profit / Loss	25.300 €	5.600 €	77,9%	x	x

Appendix 2:

Descriptive Statistics by Scenario

Scenario: Conventional accounting

	N	Mean	SD	Min.	Max.
COMPLEX	85	5.216	1.421	1.67	7
RISK	88	4.549	0.874	2.67	6.67
COST REDUCTIONS	88	7.143	1.975	0	9.88
EXPENDITURES	88	6.821	2.359	0	10.31
STAFF (Task 1)	88	163.636	1,945.533	-5,000	5,500
STAFF (Task 2)	88	-1615.909	1800.168	-8000	2000

	Count	%
Gender		
Female	42	47.7%
Male	46	52.3%

Scenario: Value Creation Accounting

	N	Mean	SD	Min.	Max.
COMPLEX	77	4.680	1.227	1.33	7
RISK	83	4.631	1.067	2	7
COST REDUCTIONS	83	6.396	2.132	0	10.17
EXPENDITURES	83	6.952	2.322	0	10.34
STAFF (Task 1)	78	633.333	1,375.638	-1,500	10,000
STAFF (Task 2)	81	-559.259	1038.602	-5,000	2000

	Count	%
Gender		
Female	48	57.8%
Male	35	42.2%

T-Test:

Variable	Group	N	Mean	T	Sign.	Mean difference
RISK	Conventional Accounting	88	4.549	- 0.546	0.586	- 0.081
	Value Creation Accounting	83	4.631			

Chi-Quadrat-Test:

	Gender
Scenario	Chi² = 1.749 p = 0.186)

8.4. Paper 4[4]

How to Institutionalize Language Change in Management Accounting: The Influence of Acceptance and Belief in the Case of 'Value Creation Accounting'

Author: Hummel, Philipp

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Abstract

This paper aims to examine the antecedents for creating change in organizational decision-making procedures through the management accounting tool 'value creation accounting' at a German retailer of organic food. The study expands previous research on drivers and barriers of management accounting change by giving first insights into the role of language in management accounting change processes using a qualitative research approach. Findings highlight the importance of understanding and belief by leaders as well as acceptance by employees for institutionalizing management accounting change.

Keywords: management accounting, decision-making practices, language, organizational change

1. Introduction

In recent years, management accounting change has become an important topic in research as well as in management practice (e.g., Burns and Scapens, 2000; Wanderley and Cullen, 2013). The information management accounting provides is recognized as "essential for companies' survival in a competitive environment" [Wanderley and Cullen, (2013), p.295], and progressive management accounting systems can support competitive advantages (Wanderley and Cullen, 2013). As management accounting can influence social perception, values, and actions, management accounting change is often used for creating change in corporate decision-making procedures (Broadbent and Laughlin 2005; Lee, 2011; Schäffer, 2004; Wanderley and Cullen, 2013; Wickramasinghe and Alawattage, 2007). Examples for a change in management accounting that shall influence decision-making procedures are the introduction of a new method for cost allocation (e.g., Shields, 1995) and the implementation of a completely new management accounting system, i.e., balanced scorecard (e.g., Kasurinen, 2002). The change in management accounting then shall influence not only the decisions made themselves but also the communication as well as the values and ethical orientation within the company (Schäffer,

[4] The citation form is in accordance with the journals guidelines and may differ from the rest of the dissertation.

2004). Management accounting directs the perception and attention of the users of accounting information and can thereby guide decision-making (Schäffer, 2004).

The way management accounting change can influence corporate decision-making procedures is widely investigated in previous research (e.g., Ansari and Bell, 2009; Arroyo, 2012; Broadbent and Laughlin, 2005; Burns and Scapens, 2000; Burns and Vaivio, 2001; Shields, 1995; Wickramasinghe and Alawattage 2007; Wu and Boateng, 2010; Yazdifar, et al., 2005). Burns and Scapens (2000) propose a framework that investigates the influence of different drivers and barriers of changing decision-making procedures through management accounting change. They show how the institutionalization of management accounting practices is needed for creating lasting change in decision-making procedures that can further influence corporate communication, values, and beliefs (Burns and Scapens, 2000).

Management accounting can be understood as a communication tool, as it is used for transferring information between users via accounting reports (Hummel and Hörisch, 2020; Masztalerz, 2016). The language used in management accounting is important for transferring specific information and perspectives on economic processes. Thereby, it can influence attitudes, social perspectives, and corporate behavior (Masztalerz, 2016; Sandell and Svensson, 2016). This is why a change of language in management accounting may influence the perception of the social reality presented in accounting terms. In this way, language change in management accounting may change corporate values, beliefs, and finally decision-making practices.

While the current language used in accounting is often criticized for neglecting ecological and social aspects in economic decision-making (e.g., McNicholas and Windsor, 2011), scholars explicitly call for a new language in accounting in order "to facilitate sustainable development" [Barter and Russell, (2013), p.145]. With this issue in mind, companies have introduced a new management accounting tool called value creation accounting (VCA; German 'Wertbildungsrechnung') in order to change decision-making procedures. VCA was developed by the German drugstore chain dm and was introduced at the German organic wholesaler Alnatura at the beginning of the 2000s (Hummel and Hörisch, 2020; Irle, 2008). There, it replaced the before used contribution margin calculation. Even though it was developed by German companies, VCA is applicable and usable by companies in all countries and in different languages (Hummel and Hörisch, 2020).

In contrast to conventional management accounting tools, "VCA uses a different, more value-oriented language design" for the single accounts in management accounting to support ethical aspects in corporate decision-making [Hummel and Hörisch, (2020), p.187]. Therefore, a language design is used that does not label the single accounts as 'costs' but uses a terminology that highlights the contributions of the accounts to value creation (Hummel and Hörisch, 2020).

In addition to the changes in terminology, VCA uses a different order of the accounts compared to conventional accounting techniques (Hummel, 2016). For example, accounting positions are divided into four different groups: “added value” for sales, less sales tax, and cost of goods, “external contribution” for all accounts that are connected to external services, i.e., costs for external cleaning service, “pre contributions” for accounts that are internally allocated to the considered business unit, i.e., allocated costs for internal human resource management, and “own contributions” for accounts directly linked to the performance of the considered business unit, i.e., costs of employees within the business unit (Hummel, 2016). Table 1 provides an example of VCA for a supermarket.

Table 1. Example of VCA for a supermarket (adapted and translated by Hummel, 2016)

	Current month	**Previous month**	**Difference**
Sales	600.000€	560.000€	+40.000€
Sales tax	100.000€	80.000€	+20.000€
Goods purchased	300.000€	290.000€	+10.000€
Value creation	**200.000€**	**190.000€**	**+10.000€**
Consumable material	200€	180€	+20€
Energy	1.000€	700€	+300€
…	…	…	…
Sum external services	**40.000€**	**37.000€**	**+3000€**
Employee department	3.000€	3.600€	-600€
IT and systems	15.600€	15.300€	+300€
Accounting	5.100€	5.000€	+100€
…	…	…	…
Sum pre values	**50.000€**	**53.000€**	**-3.000€**
Tax	800€	500€	+300€
Employee income	81.200€	74.500€	+6.700€
Investments	18.000€	19.000€	-1.000€
Debt /Relief	10.000€	6.000€	+4.000€
Sum own value	**110.000€**	**100.000€**	**+10.000€**

An important tool of VCA is the monthly report that presents the results of the business unit, i.e., supermarket, for the given month compared to other business units and time frames (see table 1). As this report is used for communicating the business unit’s value creation process, sales, and cost structure to the employees of a company, VCA is often described as an internal tool for communication (see, e.g., Hummel, 2016).

Due to changes in its appearance (i.e., terminology and structure), VCA aims at creating change in decision-making procedures, particularly by highlighting social aspects as consequences of business decisions (Hummel and Hörisch, 2020). In a survey-based experiment, Hummel and Hörisch (2020) use the language design of VCA to analyze the effects of language and wording in accounting on economic decision-making. Their findings indicate that the language used in management accounting can influence economic decision-making procedures besides the numbers themselves. In their study, VCA wording increased the decision-makers' priority of social aspects in decision-making and decreased their willingness to cut costs, most notably employee costs (Hummel and Hörisch, 2020).

This paper is based on the assumption that changes in language design of management accounting can lead to changes in corporate decision-making procedures if they are institutionalized within the company. Thus, based on a case study at a German wholesaler of organic products, it aims to answer the following research question: ***What are the drivers and barriers of institutionalizing value creation accounting as a management accounting change within companies for changing decision-making procedures?***

In the first part of this paper, a review of previous research dealing with management accounting change as well as the role of language in organizational change processes is presented. The subsequent section explains the methodological approach applied in this paper as a qualitative case study. Then, the findings of the case study are illustrated and used to answer the research question. Finally, the findings are discussed and compared with previous research, and implications for theory and practice are presented.

2. Literature Review

2.1 Language in Management Accounting

Language is a tool of communication that creates and transports social perception of reality (Berger and Luchman, 1966) and may therefore influence human understanding and decisions (Ferraro et al., 2005). Scholars indicate that "language is implicated in most of the phenomena that lie at the core of social psychology," i.e., change of attitude, social perception, and interaction [Krauss and Chiu, (1998), p.41, cited by Bavelas, (2005), p.181]. In the communication of business, language plays an important role. Schrodt (2002) states that many organizations nowadays use rhetorical means in order to influence their organizational environment, for example the behavior of employees. Concerning the culture of an organization, Jones (2011) highlights the importance of language in creating and changing corporate culture and identification.

Language plays an important role in management accounting, as accounting is used for representing and communicating a picture of reality (Masztalerz, 2016). Martineau (2017, p.244) even describes accounting as a language "that every manager must understand and learn to master accounting". Previous research intensively investigates the influence of accounting on the social perception of reality and on social aspects in economic decision-making (e.g., Cooper, 1992; Costa et al., 2014; Hines, 1988). For example, Hines (1988) shows how accounting influences the way people understand and interpret social processes. Further studies support this assumption and explicitly focus on the role of the language used in accounting and decision-making (Costa et al., 2014; Sandell and Svensson, 2016). Studies show that the specific language design used in accounting does not only represent the economic reality but can change attitudes and actions.

Previous studies show that the language chosen in accounting can influence decision-making in several aspects. This research investigates the influence of language in financial narratives (e.g., Walters-York, 1996), the power of the type of language in decision situations (Costa et al., 2014), as well as the effects of terminology used for single accounts (Hummel and Hörisch, 2020). Literature finds that the language used in accounting can have far-reaching consequences for economic decision-making and social perception of economic processes (Hummel and Hörisch, 2020). This is why numerous scholars call for a new use of language in accounting to support a more ethical economic decision-making (e.g., Hummel and Hörisch, 2020; Mitchell et al., 2015; Schaltegger et al., 2017).

While the effects of language in (management) accounting have been investigated in previous research, the study at hand focuses on the role of language in management accounting change processes and its institutionalization within organizations.

2.2. Management Accounting Change

When a company decides to change the way it reports, analyzes, or conducts corporate information to support management, the process is defined as management accounting change (Wickramasinghe and Alawattage, 2007). This can firstly be a change in the use of given management accounting tools and processes (Wanderley and Cullen, 2013). Secondly, the introduction of new management accounting tools and methods can be defined as a management accounting change (Belal, 2002; Burns and Scapens, 2000). When investigating the introduction and use of VCA instead of conventional accounting techniques, the study at hand follows the second type of management accounting change. This view is mainly supported by North American scholars (Wanderley and Cullen, 2013).

Previous research shows how management accounting not only influences the internal decisions made themselves, but also the perceived values and culture within the company (Schäffer, 2004). Those aspects of economic processes that are reported in management accounting receive more attention in decision-making and corporate discussions (Priddat, 2009). In this way, management accounting directs the perception and attention of the users of accounting information and can shift the social perception of the economic process as well as the importance ascribed to social aspects in decision-making (Schäffer, 2004; Schäffer and Steiners, 2003). Contrafatto and Burns (2013) show that this is how management accounting influences the way social and environmental aspects are perceived and treated within companies, and Burritt et al. (2019) conclude that for achieving sustainable change within companies, change in management accounting is needed (also see Schaltegger and Wagner, 2006).

This stream of research outlines the managerial impact of management accounting, which "involves more than technical issues of cost control" (Becker and Messner, 2005). However, management accounting change processes are not always successful, and changes in management accounting do not always have an influence on internal decision-making procedures (Burns and Scapens, 2000; Scapens and Roberts, 1993; Shields, 1995).

While many studies analyzing management accounting change use quantitative research methods and therefore focus on what "can be counted and measured" [Wanderley and Cullen, (2013), p.304], fewer studies focus on qualitative aspects in management accounting change processes (Wanderley and Cullen, 2013). As one of the few exceptions, Armitage et. al. (2016) use a qualitative study to analyze the influences and use of management accounting in small and medium-sized organizations. Using in-depth field interviews, they found several corporate characteristics that influence the use of management accounting in small and medium-sized companies, like the particular industry in which a company operates and the age of the company.

2.3 Institutionalization of Management Accounting Change

Burns and Scapens (2000) propose a popular theoretical framework for the conceptualization of management accounting change. They proceed from the opinion that changes in the form of the internal management accounting systems represent changes in the formal rules of the organization. These implemented new corporate rules can create new routines within the company, when they are reproduced in different ways through the behavior of the employees. When these rules and routines are used unconsciously in everyday working life, then they are institutionalized within the company, that is, they become corporate institutions (Spraakman, 2006). Burns and Scapens' framework focuses on internal institutions (Siti-Nabiha and Scapens, 2005) which are based on the definition of Barley and Tolbert (1997). Following their approach, institutions can be understood as the "taken-for-granted assumptions" that influence actions and relationships between humans (Barley and Tolbert, 1997). Institutions then contain the corporate rules and routines and in this way influence company's values, beliefs, and also the distribution of power within the company (Burns and Scapens, 2000).

When it is institutionalized, the management accounting change becomes "simply the way things are" [Burns and Scapens, (2000), p.11], i.e., it becomes the taken-for-granted way of behaving within the organization. As an essential part of the corporate management processes, these institutionalized management accounting practices "represent the expected form of behavior" and influence power and relationships within the organization [Burns and Scapens, (2000), p.11]. Previous research shows that new management accounting approaches often are not institutionalized within companies and therefore might not be able to affect decision-making procedures (Ansari and Bell, 2009).

2.4 Antecedents for the Institutionalization of Management Accounting Change

Previous research on management accounting change found some drivers and barriers that may influence the institutionalization of management accounting change (e.g., Innes and Mitchell, 1990). The investigated drivers and barriers of institutionalizing management accounting change that are relevant to the given study can be divided into three types of antecedents: organizational structure, corporate culture and leadership, and human resources.

Antecedents Related to Organizational Structure

Innes and Mitchell (1990) identify factors that influence change processes in a general manner. These are contextual factors in the wider environment of the organization that "provide decision makers with the reasons and grounds to initiate and permit change" (p. 5). Contextual factors are, for example, organizational structures as well as the structure of product life cycles (Wanderley and Cullen, 2013). In this way, management accounting change can be supported or hindered by a specific organizational structure, i.e., strict or flat hierarchical structures, given routines, and the organizational autonomy of a parent company or other stakeholders (Wanderley and Cullen, 2013).

In the same way, Roberts and Silvester (1996) identify organizational structure as a key influencing factor that may support or hinder the institutionalization of management accounting change. These structural factors include the given hierarchy of the company and the dependency of the company's departments on each other.

Management accounting change processes are time-consuming and require a lot of employee effort as well as financial resources. This is why adequate resources, e.g., financial resources and the availability of staff, are further factors identified as conducive to change in previous literature (Innes and Mitchell, 1990).

Antecedents Related to Leadership and Culture

Besides these structural factors, studies found several internal factors that influence management accounting change processes. Important internal factors identified in previous literature are in the area of organizational culture and leadership (e.g., Brooks and Bate, 1994; Markus and Pfeffer, 1983; Waweru et al., 2004; Waweru et al., 2005; Wu and Boateng, 2010).

Management accounting change is shaped by the existing institutions within the organization, i.e., organizational routines, norms, and ways of thinking. For this reason, the management accounting change needs to fit into these institutions that are already in place to become institutionalized (Burns and Scapens, 2000). This is why the "habits of organizational members and the underpinning assumptions which are taken-for-granted" are important influences on management accounting change [Burns and Scapens, (2000), p.13].

Wanderley and Cullen (2013) show how management accounting is often defined as a "fundamentally local concern" (p. 298), which means that further internal factors in regard to leadership and corporate culture influence management accounting change. Management accounting change as a local phenomenon is influenced by the kind of relationships within the company, like power asymmetry and political interplay (Wanderley and Cullen, 2013). Additionally, Burns and Vaivio (2001) point out the role of the company's top management in successfully implementing management accounting change.

In addition to the drivers of institutionalization of a management accounting change, Burns and Scapens (2000) define several barriers in regard to leadership and culture, that create resistance to change: competing interests and objectives, lack of knowledge and experience within the company, missing openness of leaders to change the way of thinking, as well as existing routines and institutions within the company.

Antecedents Related to Human Resources

Besides the role of leaders, the role of employees in management accounting change has perceived much attention in previous research. Burns and Scapens (2000) explicitly state that it is not only the openness of leaders but also the openness of employees that influences institutionalization of management accounting change. Since management accounting change can influence organizational routines, values, and beliefs, employees need to be open for changing the way of thinking as well as existing routines (Burns and Scapens, 2000).

Further influencing factors regarding human resources identified in previous literature are individual commitment of employees as well as their attitude towards change and understanding of the change process (Argyris and Kaplan, 1994; Strebel, 1996; Waweru et al., 2004). This is supported by the study of Shields (1995) whom identifies sufficient employee training as a further influencing factor of management accounting change. Cobb et al. (1995) emphasize the role of individual employees as leaders in change processes. They found several barriers to a management accounting change, most notably the changing priorities, and staff attitudes to change.

All in all, management accounting change as well as its barriers and drivers has been investigated intensively in research in past decades (Arena and Azzone, 2005; Burns and Scapens, 2000; Burns and Vaivio, 2001; Lee, 2011; Shields, 1995; Spraakman, 2006; Waweru et al., 2005; Wickramasinghe and Alawattage 2007). Research found that "an understanding of the habits of organizational members and the underpinning assumptions" are required to understand management accounting change [Burns and Scapens, (2000), p.13]. Since previous research on management accounting change mostly uses quantitative methods, Wanderley and Cullen (2013) suggest that this research should be further developed by using a qualitative research approach to focus on "the 'how' and 'why' questions in a research project" [Wanderley and Cullen, (2013), p.304]. Similarly, Parker (2012) calls for more qualitative research on management accounting to consider aspects that are difficult to measure, like values and individual perception.

2.5 The Role of Language in Change Processes

Burns and Scapens (2000) base their framework of the institutionalization of management accounting change on the relationship between speech and language. They argue that for effective speech, the used language "must conform to the underlying, tacitly understood, structure of the language" [Burns and Scapens, (2000), p.8]. Similarly, management accounting changes need to fit the rules, routines and norms within the organization. Burns and Scapens (2000) note that language changes over time through the speech acts of society. In the same way, organizational institutions change over time due to the activities of employees and leaders, i.e., changes within management accounting (Burns and Scapens, 2000).

While previous studies investigate the institutionalization of management accounting change in general, less attention is paid to institutionalization of language changes in management accounting as part of an organizational change process. In order to investigate the influence of language (change) on decision-making processes, Hines (1988) highlights that people create the society and its concepts, i.e., language, themselves and, at the same time, accept and thereby institutionalize them. In this way, society is regulated by these concepts, who form a "symbolic order" [Cooper, (1992), p.30]. This symbolic order is already in place in society and must be accepted and institutionalized by human beings in order for them to take part in society (Cooper, 1992). People confronted with language have to accept the specific language and its logic to use it for communication. Under these circumstances, language can influence perception and human actions (Cooper, 1992). Then, language "not only reflects our worlds but also shapes and creates them" [Cooper and Senkl, (2016), p.498].

In the same way, management accounting is able to create a specific view on economic processes and thereby may influence behavior and values of employees (Breton and Aggeri, 2018). Lopatta et al. (2017) show that the language in accounting information has power beyond the quantitative information itself. By analyzing the effects of VCA, Hummel and Hörisch (2020) found that VCA can increase the importance ascribed to social aspects in decision-making and thereby leads to changes in decision-making.

Table 2 shows the theoretical perspectives and potential influencing factors elaborated on in previous research that was considered as important for the aims of this study. Numerous previous studies investigate management accounting change and its antecedents for institutionalization within companies. However, the antecedents for institutionalizing management accounting change through language design in management accounting, i.e., implementation of VCA, has not been studied so far. For this reason, previous studies (e.g., Hummel and Hörisch, 2020; Parker, 2012; Wanderley and Cullen 2013) explicitly suggest future research to address long-term effects of management accounting change using qualitative case studies. This study complements prior research by offering a qualitative analysis on the effects of VCA. A case study is performed at Alnatura to determine antecedents for institutionalizing VCA as management accounting change.

Table 2 Antecedents for institutionalizing management accounting change and language change

Antecedents for institutionalizing management accounting change related to…	
…organizational structure	- Adequate resources (Innes and Mitchell, 1990) - Organizational structure (Wanderley and Cullen, 2013)
…leadership and organizational culture	- Organizational culture (Burns and Scapens, 2000) - Value-fit (Burns and Scapens, 2000) - Top-level management support (Burns and Vaivio, 2001) - Openness by leaders (Wanderley and Cullen, 2013) - Diverging goals and interests (Wanderley and Cullen, 2013)
…human resources	- Openness and attitude towards change (Burns and Scapens, 2000) - Employee turnover (Cobb et al., 1995)
Antecedents for institutionalizing language change related to..	
…individual level	- Understanding (Cooper, 1992) - Acceptance by individuals (Hines, 1988)
…group level	- Be in Place first (Cooper, 1992) - Belief in it (Cooper, 1992)

3. Method

This study follows the call of previous research (e.g., Hummel and Hörisch, 2020; Wanderley and Cullen, 2013) and conducts a qualitative analysis to explore the use of VCA in a case study. This approach is commonly used for case studies in which there is limited research (Benbasat et al., 1987), and offers the opportunity to investigate practical situations in a natural setting (Bryman and Bell, 2011). The given study is based on semi-structured face-to-face interviews. The participants were employees from Alnatura, which is the largest German retailer of organic food. Alnatura sells organic food and non-food articles in 126 supermarkets throughout Germany. About 1,300 Alnatura products are sold in more than 14,000 supermarkets and drugstores in Germany and Europe. Alnatura employs over 2,960 people and generated a turnover of 770 million Euros in the financial year 2016/2017 (Alnatura GmbH, 2018).

For this study, 15 interviews were held over ten months between January and October 2018. The interviewees were store managers of Alnatura, as sales and store management is a key topic of management accounting at Alnatura. The interviewee selection was done considering the interviewees' gender and location within Germany. Apart from these criteria, the interviewee selection was random. These criteria are "not intended to achieve statistical representativeness" for Alnatura's employee population but rather to have different perspectives from various employees [Carollo, (2016), p.145]. Due to the use of face-to-face interviews and the process of interviewee selection, the identity of the interviewees was not completely anonymous and confidential, which may limit the results for the reason of not being credible. However, the interviewees were assured that the research is conducted independently and for scientific use only. Additionally, the interviewees received a written agreement which assures them that the interview material is 100% treated confidently and anonymously. For this purpose, the interviewees were assured that the transcriptions of the recordings would be anonymized and that no conclusions could be drawn about the interviewee.

In order to mitigate a potential bias in the interviewees' accounts, especially due to the absence of anonymity, and to ensure credibility of the findings, the study uses further sources of data for the analysis, e.g., company management reports and press releases.

As it is the case in previous studies, the interviewees chose the location for the interviews (Carollo, 2016). The main purpose of this was to make them feel as comfortable as possible. All of the interviews took place at the workplace of the interviewees or a public place nearby. The length of the interviews varied between 30 to 60 minutes. All interviews, except two, were fully recorded and transcribed. The interviews were held in German and translated into English for presentation in this paper. In order to ensure consistency of meaning when translating the interviews, the translations were double checked by a second researcher.

The interviews investigate the organizational context in relation to current and successful management change practices as well as the organizational factors influencing the management of organizational change processes, i.e., VCA. The main focus of the interview was the interviewees' use and perception of VCA, especially its influence on the organizational structure, company culture, and human resources and vice versa. The interviews' basic structure is provided in appendix A. in order to make sure that the interview approach was consistent in all interviews, all interviews were conducted by the author of the study following previous studies (e.g., Armitage et al., 2016)

The data is collected by using a semi-structured interview guideline to facilitate an in-depth interview with store managers of Alnatura. The semi-structured interview process enables the interviewer to focus on a limited number of points and makes it possible to "obtain rich and in-depth data" [Bögel et al., (2019), p.363]. The interview material was evaluated based on the generic process model proposed by Mayring (2000). A multi-step process was used to identify the key findings from the interviews:

- Before starting the analysis process, the researcher read through the transcribed interviews and the additional material to "obtain the sense of the whole" [Bengtsson, (2016), p.11].
- Next, the analysis aspects were described, including coding rules, definitions, and examples. The coding rules were defined in a coding list that includes definitions of the codes and examples to "minimize a cognitive change during the process of analysis in order to secure reliability" [Bengtsson, (2016), p.12]. In order to increase the validity of the coding procedure, two investigators performed the coding separately for a selected number of codes according to the coding rule agenda and then compared and discussed their results as well as the obtained consensus.
- In a further step, the open coding procedure was started by the researcher breaking down the material into smaller "meaning units", that is, sentences or small paragraphs of the material that are coded according to the coding rules [Bengtsson, (2016), p.11]. Each meaning unit was labelled with a code that "should be understood in relation to the context" [Bengtsson, (2016), p.11].
- After analyzing about 25% of the material, the categories, and coding agenda was checked and modified if necessary.
- After the analysis process, a final revision of the texts and check of reliability was conducted.
- In the following process, categories and sub-categories were identified, which "should be internally homogenous and externally heterogeneous" [Bengtsson, (2016), p.12]. Then, the findings and results were interpreted and compared to the results from previous research.

4. Findings

This section presents the main results of the analysis process. After a description of the use of VCA, the presentation of the results is divided into the three types of antecedents for institutionalization of management accounting change identified in the literature review.

4.1 The Use of VCA as a Communication Tool

Participants mainly use VCA once a month to get a general overview and feedback about the efficiency of the business unit for the previous month. Interviews show that VCA is not only used for decision-making itself but also for communicating and understanding economic processes:

> We use VCA to understand financial processes in our supermarket. It shows us how well we worked in the last period and what we can do better. VCA makes it possible for us to better understand the economic process. We communicate VCA to our employees and show them how things work in our company. (Tanja)

Press releases introducing the VCA approach at Alnatura support this view by highlighting the transparency of VCA as an important difference to the before used management accounting tool. Thus, every employee at Alnatura is able to check the performance of their business unit, i.e., supermarket, on the computer (Irle, 2008).

VCA is used by the interviewees themselves as well as their assistants and some other employees. Most of the interviewees said that they put the VCA report in the employee room where all members of their team can have a look at it and get an idea of the financial performance in the previous month. This is done “to get as many people on board as possible.” (Daniel) The interviews clearly show that VCA serves as an essential reflection tool concerning the economic reality of the business unit. Furthermore, VCA is used as a basis for decision-making and as a feedback tool. The users compare the results of the VCA report with a predefined plan as well as with the results of other internal business units.

In the interviews, the structure and order of the accounting terms of VCA play a major role. Most interviewees describe the structure of VCA as an expression of the understanding of value creation as a process of working together. The structure of VCA describes two opposing perspectives, the perspective of the customer (sales) and that of the company (value creation), as it is the case with ‘costs’ in conventional accounting. The vocabulary of VCA is seen as very important, as it strongly differentiates from the language of conventional accounting. The different vocabulary of VCA is often associated with the importance of social factors in decision-making. This is particularly evident with the activities (and costs) of employees, which are presented as an essential part of value creation in the economic process. The accounting term ‘employee income,’ instead of ‘staff costs’ in conventional management accounting, is particularly perceived as a specific expression of social reality:

> Employee income is associated with wages and salary. The appreciation that the employee creates values and does a good job. This is a completely different perspective on the employees and their work (…) and the term “staff” is negative associated. Staff costs have a negative impact so that it does not sound positive. You do not want to generate costs. The negative impact is in focus. (Maria)

Just like the accounting term ‘employee income,’ the term ‘values’ instead of ‘costs’ is seen as very important for the given perspective on economic processes. The choice of terms aims to reflect those expenditures relate to the different factors needed to create value:

> If one designates the activities in the headquarter as 'pre-values,' then the positive value character is in the foreground. It means that people are doing something for you. With costs, this is directly negative. One does not appreciate it but sees it as something negative. No one wants to have costs, but everyone needs value creation. (Thomas)

Some of the interviewees did not see any or only limited influence of VCA on decision-making procedures and/or company culture compared to conventional management accounting tools: "After all, we're still distributors and need to keep an eye on our outcomes." (Peter). Others described a strong influence of VCA on decision-making procedures, especially on the company culture of Alnatura. One interviewee, who had been in a situation of financial distress, stated that VCA makes people try to find other solutions rather than only cutting staff costs:

> If I take an 'employee's income' and if I reduce 'staff costs,' then the starting point is the same. But perhaps I would be able to find a different approach. For 'staff costs,' I would perhaps cut costs. And for an 'employee's income,' I would rather look for alternative solutions. (Ralph)

Additionally, many interviewees see VCA as a necessary part of Alnatura's organizational culture to promote the company's values and reflect them in the field of accounting and decision-making. Some interviewees expect that, without VCA, Alnatura might lose some of its cultural values.

When analyzing the interviews, it is noticeable that the process of change through VCA is carried out in a very specific organizational context at Alnatura. Some of these context factors are perceived as drivers, while others are perceived as a barrier of creating change in decision-making procedures through VCA. Three major fields that may influence the institutionalization of VCA are investigated: organizational structure, company's culture and leadership, and human resources.

4.2 Antecedents Related to Organizational Structure

Interviewees described it as beneficial that the organizational structure at Alnatura is flat and non-hierarchical. In general, communication within the company is direct and open. Furthermore, collaboration is perceived as collegial and on eye level. Even if organizational structure and hierarchy are needed in general, the interviewees said that structures at the company should be flat and flexible. Structures should make it possible for all employees to use VCA. This can be a beneficial factor for supporting the institutionalization of VCA. Companies still need structures and rules, but these need to be flexible to support VCA. For this, you need "a lot of trust as well as working at eye level and very flat hierarchies (…)." (Andrea).

In management reports, the approach for internal communication is described as creating an appreciative and interested attitude within the company towards each other *(*Alnatura GmbH, 2018*).* Communication within the company is aimed to be on eye level, and every leader as well as every employee is asked to give mutual feedback within their working teams. This is also part of the leadership guidelines and trainings of the company (Alnatura GmbH, 2018, 2020).

Many interviewees especially described the structure and organization of corporate internal communication as an important factor for the use and success of VCA. The necessary factors for internal communication are to be direct, open, and very transparent. Transparent communication and information can be seen as a key antecedent of organizational structure for the institutionalization of VCA since it is highlighted by many interviewees. As mentioned before, VCA should be communicated openly and transparently to all employees of the team, not just to supervisors and management.

While flat hierarchical structures and transparent communication are considered as driving forces for the institutionalization of VCA, scarcity of resources such as time is seen as a hindrance to the institutionalization of VCA. People, especially leaders and employees, need time to engage with VCA, understand the values transported by VCA, and talk about it: “That's just like VCA as such. You need time to deal with it.” (Paul).

The scarcity of resources like time and economic pressures is considered as the most important hindrance to this kind of management change. One participant compared Alnatura with a conventional discounter, where the (economic) pressures on employees and leaders are perceived as much higher, and it might be a hindrance to successfully reach an institutionalization of VCA:

> But for the majority (of discounters), the pressure is just that big. It comes from above, from the regional management. That's just, I think, so big that it would not work that well. (Daniel)

The scarcity of resources presented in the interviews is mostly due to economic pressures of missing time, missing employees (or employee capacity), and missing financial resources.

4.3 Antecedents Related to Company Culture and Leadership

The interviews show that there is a strong connection between VCA and the organizational culture. Thus, it may be interesting to take a closer look at the perceived organizational culture and working environment at Alnatura and its potential effects on the institutionalization of VCA.

Alnatura's organizational culture attaches great importance to prioritize social and ecological aspects over financial aspects in its activities. Organizational culture therefore focuses strongly on considering all stakeholders in the decision-making process. The importance of social aspects in the company is also presented by the fact that the working environment is often described with the metaphor ‘family’:

> It's a bit like a big family. You listen to each other and you are there for each other. (Maria)

Concerning VCA, the importance of a value fit between the organizational values and goals connected with VCA can be found in the interviews. For institutionalizing VCA, some cultural values need to exist in the company that fit the values connected with VCA. When the company culture values social aspects, VCA can transport these values into decision-making procedures.

Management reports of Alnatura highlight the importance of social aspects in leadership within the company and for their corporate culture (Alnatura GmbH, 2020). Additionally, press releases about VCA at Alnatura highlight those specific values need to be in place first so that VCA can be used efficiently. In their article about VCA at Alnatura, Irle (2008) shows that the values that can be supported by VCA need to exist within the organization so that VCA can support these values in corporate decision-making. Additionally, leaders need to be open for a change of their attitude and of given routines and values, and they should also be open for giving up responsibility (Irle, 2008). The company’s leadership guidelines cover this aspect by asking leaders to be open for working on their own attitude and values regarding the company’s culture and support these values (Alnatura GmbH, 2018).

Besides cultural values, interviewees mentioned the importance of a trial-and-error culture that allows learning from it. Failures are seen as a positive effect for learning and personal development. This culture needs an understanding of mistakes as chances for learning and personal development, not as something that has to be avoided. Besides the trial-and-error culture, leadership plays an important role in enabling employees to understand VCA and to enable individual as well as organizational change processes. Leadership has to take time to explain the importance and the aims of VCA to its employees:

> Explain how we think and what we mean. On the one hand, the concepts are confusing. On the other hand, they can help to understand and experience the culture. One gets involved in the concepts and culture of Alnatura. (Maria)

Leadership needs to understand the concept and aims of VCA, to be able to transport this knowledge to their employees. Besides understanding, leaders need to believe in the importance and the success of VCA to transport the aims and values of VCA. This is perceived as important antecedents for the successful use of VCA:

> The regional manager has to live the values he communicates. He listens to you (...). (Maria)

Alnatura offers their employees a variety of trainings on several different topics. These topics include values and beliefs of Alnatura's culture. For example, in the "Kulturimpuls" seminar, employees from different management levels can discover the company's vision, mission, and corporate principles together (Alnatura GmbH, 2020).

The role of leadership and company culture is seen as a crucial factor for the success or failure of VCA. The values and aims of VCA have to be accepted by leaders and they have to be motivated to support these values in their working team:

> So, if that's what the term is, then it's effective (…). If this is just written on the wall and not lived, then you can forget about it." (Thomas)

In addition to the support and belief of managers, the interviewees mentioned the importance of the support of top management. Alnatura is a family-owned business lead by Prof. Dr. Rehn, whose role in supporting the power of VCA and social change is mentioned by many interviewees.

Alnatura was founded in the 1980s by Professor Dr. Rehn (Alnatura GmbH, 2020). In internal as well as public interviews, his role as a pioneer regarding sustainable entrepreneurship is highlighted (Alnatura GmbH, 2018, 2020). For example, in his interview in the foreword of the Alnatura public sustainability report, he talks about his ideal of creating something meaningful for people and the earth with founding Alnatura, and about the importance of values for the leadership culture at Alnatura (Alnatura GmbH, 2018).

To sum up, the interviews show the importance of "living the values of VCA and explanation of it." (Thomas). Consequently, leaders have to accept the values, follow them, and explain these values to their employees. Additionally, the top management support is found to be a crucial success factor. Only then can VCA have an impact on organizational change.

4.4 Antecedents Related to Human Resources

When it comes to the antecedents on the level of human resources, the way employees react and handle VCA is seen as an important factor in the interviews. First, motivation and openness of employees to work on their beliefs and values is mentioned by many interviewees. The interviews show that the motivation of employees is a critical factor for the success of VCA since employees have to deal with the values of VCA, understand and accept them, and integrate them into their working behavior:

> Employees need to be open for a mind change and motivated. They should also try to understand the values. (Paul)

Consequently, employees need the willingness and motivation for changing themselves and the organizational culture. They have to be willing to deal with the values of VCA as they "must always be lived and desired." (Paul).

For supporting this willingness for change, motivation and openness may be helpful if employees understand the aims and goals of VCA. When understanding the aims of VCA, it may lead to dialogue about the values of an organization that may support organizational change. One interviewee described her own experience with understanding the company's values through dealing with VCA. She explained how she was irritated when she started working with VCA for the first time. Then she started dealing with VCA, its numbers, terms, and vocabulary. Finally, she understood the aims and values of VCA and its importance for company culture. This was the point when she started to change her thinking about social values and social aspects of decision-making.

The interviews show that employees that are not motivated and open to cultural change can be a hindrance to the institutionalization of VCA. The language design and values of VCA need to be understood and accepted by the employees. Consequently, it is not only about motivating employees but much more about openness for something new and about acceptance of VCA as a new tool:

> It is important and necessary that employees do not oppose it. Besides, they need to deal with the concepts and internalize it. They have to accept the language. (Paul)

The interviews show how VCA needs to be accompanied by a specific attitude. Employees need to be open and willing to work on their values as well as their beliefs to develop and share an attitude that supports the values connected to VCA:

> The important thing is how you think about it (...). You have to develop a certain attitude. Only then can the changed language change the way we see and act in the world. (Paul)

The interviews provide some examples of how this institutionalization of VCA can work in practice. Most frequently, interviewees said that it is necessary for leaders to know the meaning of the new language design and communicate it to their employees. Then, the employees also need to understand the reasons behind this language and develop a new way of thinking:

> As I have said earlier, it's about living it and it's about an explanation: We do not want to use the concept of staff but the concept of employees, because they work with each other and cooperate. We see ourselves as a working group. (Thomas)

All in all, the analysis of the interviews found certain antecedents related to organizational structure as well as to organizational culture, leadership, and the individual level.

5. Discussion and Conclusion

5.1. Discussion

As management accounting can influence corporate values, beliefs, and decision-making, management accounting change has become an important topic in science and business practice in recent years. However, not every management accounting change automatically leads to successful changes within an organization (Burns and Scapens, 2000). This is why an institutionalization of management accounting change is necessary to support a successful implementation of the change. Previous research has already examined a variety of barriers and drivers of institutionalizing management accounting change within companies (e.g., Burns and Scapens, 2000; Kasurinen, 2002). Most of these studies use quantitative research methods for investigating management accounting change and thus are limited in analyzing qualitative aspects like attitudes, values, and beliefs (Wanderley and Cullen, 2013). This is why previous scholars call for investigating management accounting change processes using qualitative methods (e.g., Wanderley and Cullen, 2013). In addition to this lack of research, limited attention is given to the antecedents for institutionalizing management accounting change through language design, i.e., VCA, in previous research (Hummel and Hörisch, 2020). This is why the study at hand uses a qualitative research approach to answer the following research question: What are the drivers and barriers of institutionalizing value creation accounting as a management accounting change within companies for changing decision-making procedures?

Having a limited sample size in mind, some conclusions can be drawn from the study at hand. As it is the case in previous research, this study found a variety of drivers and barriers for the institutionalization of management accounting change, i.e., VCA, that can be divided into three types of antecedents: organizational structure, culture and leadership, and human resources.

Previous research on the antecedents of management accounting change mainly focuses on antecedents of organizational structure. These factors include the corporate hierarchical structures and communication as well as resource management. The interviews support this assumption and show that, in the case of VCA, a flat hierarchical structure and direct transparent communication on eye level are seen as drivers of a successful institutionalization of management accounting change. An additional structural element that perceives much attention in the interviews is the existence of adequate resources. These resources include time for dealing with VCA as well as adequate financial resources to prevent excessive economic pressures (where possible).

Besides these structural factors, cultural factors are assigned much importance in the conducted interviews. Especially the values of the organizational culture and the values VCA aims to support (i.e., ethical values) are seen as important factors when introducing and using VCA. A value fit between the values, beliefs, and culture within the organization and the VCA is needed to successfully institutionalize VCA. That means that the values that VCA wants to support need to exist within the organization's culture and leadership, for example, by introducing them within leadership guidelines and by employee/leadership trainings.

In regard to organizational culture, the interviews show that a trial-and-error culture can support VCA. In general, mistakes shall be seen as something positive since you are able to learn something and gain new knowledge. As concluded in previous research (e.g., Burns and Vaivio, 2001), in the interviews, the top management also plays an important role in supporting the institutionalizing of VCA by transporting the values and the importance of VCA to the leaders and the employees.

Additional to leadership and culture, human resources are found to be important influences on the institutionalization of VCA. Just as Burns and Scapens (2000) found, the interviews showed that employees need to be open to change their attitude and routines when working with VCA.

Besides the similarities to previous research, some differences need to be introduced and discussed on antecedents for institutionalizing language change in management accounting, i.e., VCA. The findings of this paper mainly differentiate from previous research concerning the task of leadership and the function of the employee. As concluded in previous research (e.g., Cobb et al., 1995), the interviews show that leadership plays an important role related to supporting the institutionalization of management accounting change. However, in contrast to previous research on management accounting change, the analysis of the interviews shows that it is necessary for the leaders to believe in the effects and importance of the management accounting tool, i.e., VCA. Leaders need to understand the purpose of VCA, communicate it to their employees, and believe in the effects and benefits of VCA. Further, the leaders have to transfer VCA into the working environment and encourage the employees to understand the values. While previous research states that leaders shall be open for changing their own beliefs and values within management accounting change (Burns and Scapens, 2000), the interviews show that, in the case of VCA, it is necessary for leaders to not only be open for a mind change but also to believe in the effects and importance of VCA. Thus, its role is crucial for transporting the values of VCA and differs significantly from previous research.

The reason for the different roles of leaders in VCA can be explained by adducing the role of language in change processes as investigated by previous research (e.g., Cooper, 1992; Hines, 1988). Cooper (1992) argues that for institutionalizing language within groups of people, i.e., society, the influencing object, i.e., language, has to be in place first. That is, the specific logic and design of language have to be lived, recognized, and accepted by the people to become institutionalized. In the case of VCA within an organization, the specific logic of VCA has to be recognized by the leaders of the organization. In this way, VCA can be "in place" [Cooper, (1992), p.30] and thus support an institutionalization of VCA. Leaders have to believe in the importance of VCA's aims and apply VCA and its values. In this way, they can transport the values of VCA to their employees. In contrast to other management accounting change studies, this study highlights the relevance of the belief in VCA and the acceptance of its values by the leaders for a successful change of decision-making procedures.

On the level of human resources, the interviews show that, in the case of VCA, employees do not only create the change but are part of the change themselves. This is why it may be important for employees to understand the purpose of VCA and accept it with its connected values. Employees have to be willing to be part of the organizational change, connect with the values of VCA, and be willing to change their minds and beliefs. As Cooper (1992) concludes, in order to be an unconscious part of social reality, the logic and meaning of language and accounting have to be accepted by individuals. This study shows that VCA can support change in decision-making practices, if the employees as well as the leaders accept the meaning of VCA. That is why the acceptance of the employees is an important factor in VCA use beyond the openness to deal with the change. If employees accept the meaning of VCA, then it can create change in decision-making practices by supporting a new attitude of decision-makers that supports social values.

As investigated in previous literature, it is necessary for the management accounting changes to also match the institutions in the company that are already in place (Burns and Scapens, 2000). At the same time, the new management accounting practice can also be institutionalized under the antecedents outlined above. In this case, it influences organizational rules and routines as well as corporate values and beliefs. The interviews show how the structure and language of VCA create and institutionalize a certain way of thinking about economic reality. This view puts more importance on social aspects in decision-making. In this way, VCA can contribute to a change in decision-making procedures.

5.2 Implications for Theory and Practice

Previous research on management accounting change found that the institutionalization of change is needed for changing decision-making procedures (Burns and Scapens, 2000). In this way, new management accounting approaches can form institutions and thereby influence corporate values, beliefs, and decision-making procedures. While drivers and barriers of institutionalizing management accounting change are outlined in previous studies (e.g., Waweru et al., 2004; Wu and Boateng, 2010), less attention is paid to institutionalizing management accounting change related to changes in language design, i.e., VCA. This study combines research on management accounting change with research on language change and gives first insights into antecedents for institutionalizing changes through new language design in management accounting, i.e., VCA. It thereby outlines some antecedents, most notably the role of leadership and employees. This paper applies the framework of Burns and Scapens (2000) to the case of VCA by using a qualitative case study. Findings show that their framework can give further insights into the effects of language change in management accounting but needs to be combined with theory on language change.

As investigated in previous research, language plays a particularly important role in management accounting change processes by influencing social perception and behavior. However, this study found that the effects of language in management accounting change need some effort on the side of managers to be successful. In fact, an institutionalization of VCA is necessary, and therefore some antecedents are required that may support or hinder management accounting change.

The implications for managers therefore suggest that companies should pay more attention to internal factors in processes of management accounting change through new accounting approaches, especially the attitude of leadership and employees towards the content of change.

As it is the case with spoken language, the logic of VCA has to be “in place” [Cooper, (1992), p.30] among the leaders of the company first. Then, it has to be conveyed to the employees. This can be done by means of the explanation of the logic, e.g., by training and seminars. Employees have to understand the logic of VCA, and thus adequate resources, especially time to learn about VCA and its values, are needed as well as openness of employees to deal with VCA, its values, and their own attitude. From the leaders, a brief understanding of VCA and its values is needed. Additionally, leaders need to be open to change their own attitudes and values as well as their kind of leadership. For example, leaders have to be willing to give their employees more responsibility and transparency concerning information. Those aspects of leadership can be integrated into the company’s leadership guidelines, policy, and trainings to support the institutionalization of management accounting approaches like VCA. Table 3 provides a brief summary of the findings regarding influencing factors and practical implications for managers.

Table 3. Influencing factors and practical implications of VCA

Antecedents related to…	Influencing factors	Practical Implications
organizational structure	Flat hierarchical structure	Develop non-hierarchical structure
	Transparent and direct communication on eye-level	Develop transparent and direct corporate communication approach to all employees
	Adequate Resources	Give time for dialog and dealing with the change
culture and leadership	Organizational value-fit	Support ethical values in your organization, i.e., trainings and seminars.
	Trial-and-error culture	Create a trial-and-error culture that allows making mistakes
	Belief and openness of Leadership	Support importance of change to leadership and train leader's attitude towards change content (e.g., leadership guidelines and trainings)
	Support of top management	Involve top management in communicating change process
human resources	Openness of employees	Train employees to be open for a mind change
	Understanding and acceptance of VCA	Offer dialogue and trainings for understanding importance of change and corporate values

5.3 Conclusion and Limitations

All in all, this study examines the antecedents for institutionalizing management accounting change through a new language design, i.e., VCA. In contrast to previous research, the given study shows that the role of the individuals, i.e., leaders (leadership) and employees, differs from the role in general management accounting change processes. For institutionalizing management accounting change through VCA, the most important thing is the attitude of leaders and employees towards VCA and the change itself.

As it is the case in all studies, the given case study has some methodological limitations, such as the lack of generalization of the population, which establishes some limitations concerning the interpretation and application of the results. The first limitation is the small and restricted sample size of selected people who are all working in the same organization with the same cultural context. Due to limited resources, only 15 interviews with managers from one company were held in the course of the study, neglecting the comparability with other companies. Further, none of these interviews were held with managers from the head quarter of the company. Consequently, it is better to be cautious when transferring these findings to other companies with different cultures and working environments as well as to other countries with different ways of life and languages. Further studies might enhance the analysis by considering different organizations and countries.

In terms of VCA being used as a communication tool, the interviews do not state clearly whether all the actions reported by the interviewees are voluntary or required by the management, for example, within their leadership guidelines and policy.

Finally, as stated in the methodology section of the given study, the identity of the interviewees was not completely anonymous, which may limit the credibility of the findings. However, the interviewees have been assured that the interview material will be treated independently, confidently, and anonymously. Additionally, further sources of data (e.g., management reports and press releases) were used for the analysis to ensure credibility of the findings.

Wanderley and Cullen [(2013), p.304] highlight that qualitative studies “reveal the human, social world behind the numbers that require and may trigger new management accounting practices” and therefore call for more qualitative research on management accounting change. The given study follows their call by conducting a qualitative study on the antecedents of institutionalizing management accounting change on VCA. It offers first insights into differences and similarities between management accounting change processes in general and language change processes in management accounting, i.e., VCA.

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Appendix A. interview basic structure

This structure and questions was used as an overall orientation during the interviews. However, as the main focus was to have an open conservation and to get to know the individual and personal perception of the interviewees to the topic, the interviews were open and could differ to this structure.

Interview Topic	**Sample Questions**
Personal Background	Tell me something about your professional background.
Company culture	How do you perceive the company culture at Alnatura?
Understanding of VCA	Please describe VCA.
Use of VCA	How do you/your team work with VCA?
Differences of VCA to conventional accounting approaches	Can you compare VCA to other accounting techniques?
Effects of VCA	How does the work with VCA influence your work at Alnatura?
Process/Antecedents of management accounting change	Are there any antecedents to use VCA? Are there any factors needed/helpful/challenging in regards to (1) organizational structure (2) leadership and culture (3) human resources (4) others?
Further aspects	Are there any other aspects that you would like to address in this context?