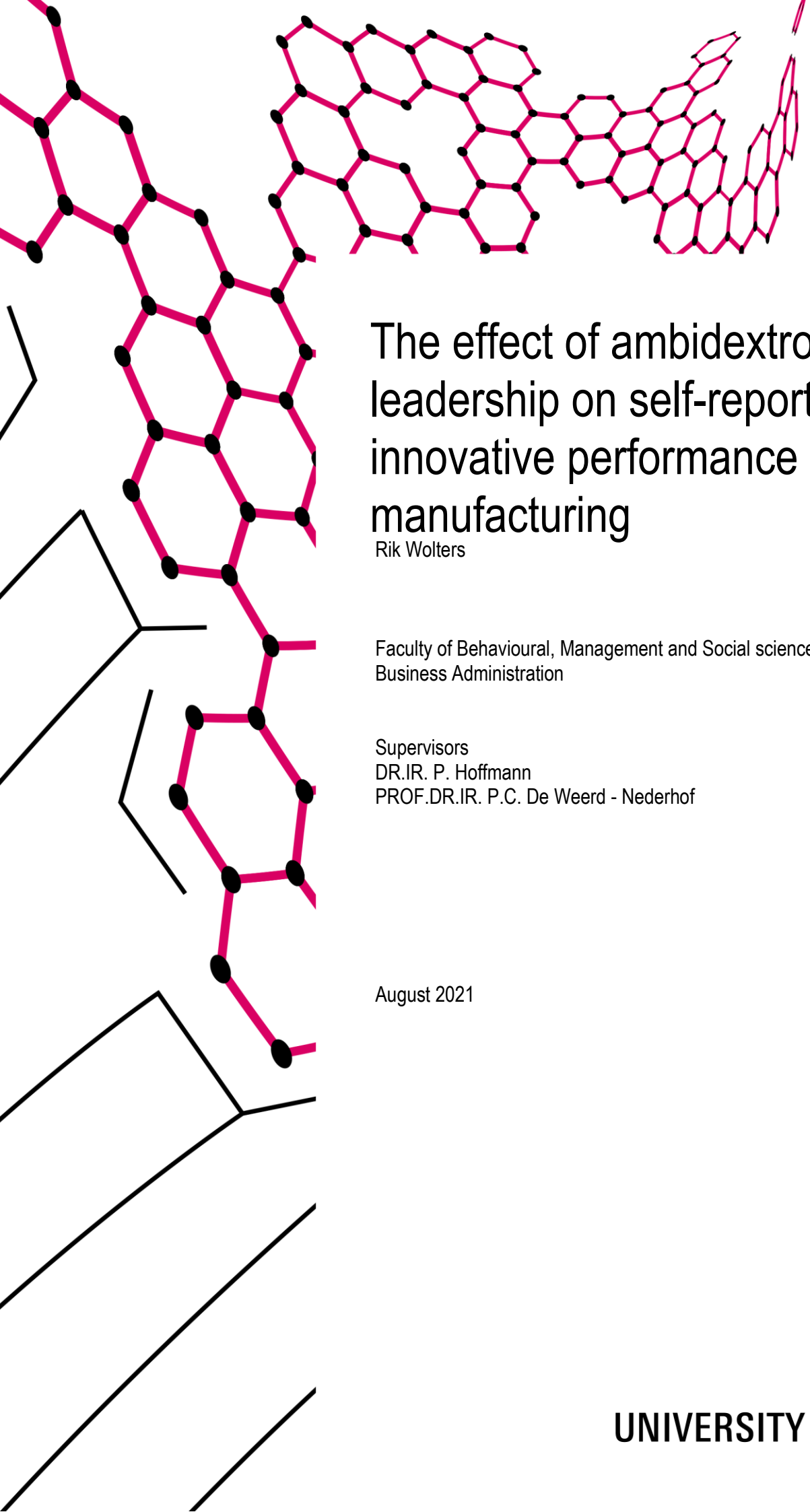

The effect of ambidextrous leadership on self-reported innovative performance in manufacturing

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Abstract

The importance of innovation for organizations to gain competitive advantage is widely known. Staying innovative can be achieved through organizational ambidexterity. Organizational ambidexterity is the ability of an organization to be explore and exploit simultaneously. Within the research field of ambidexterity there has been an increasing call for more research on the impact of leaders practising ambidexterity. An ambidextrous leader switches between an opening and a closing leadership style in order to improve the innovative performance of its team members. Where many studies have focussed on fast changing environments and higher management, this thesis looks at lower management in a manufacturing company (slow changing environment). Resulting in the following research question: “To what extent does the leadership style of lower educated leaders affect the innovative performance of lower educated employees in the manufacturing industry?”.

To test if this different setting provides other results, respondents were asked to rate their team leaders leadership behaviour, their own explorative and exploitative behaviour and their own innovative performance. The results indicate that team leaders use a more closing leadership style than opening leadership style. However, there is no significant effect of the closing leadership style on the innovative performance of employees. There is a strong and significant effect of opening leadership behaviour on innovative performance, which is moderated through employees exploration behaviour. It is argued that a minimum of closing leadership behaviour is necessary before team leaders can switch to a more opening leadership style. Because closing leadership behaviour is on a stable high level, this does not explain the innovative performance and the opening behaviour does. After reviewing the results with the team leaders it turned out that all ideas are filtered by the team leaders and therefore have a crucial role in turning ideas into actions. The explanation for this is there is little room for error, since there is always pressure on output and strict quality guidelines. Some ideas might maximize production output, but endanger the employees safety this idea will not be put into practise. Lower educated employees might not always oversee all aspects and that is the team leaders responsibility. Overall, lower management also show ambidextrous leadership, but always have to show a high level of closing leadership and switch mainly in the amount of opening leadership. This results in innovative performance being mainly effected by opening leadership.

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1. Introduction

The importance of innovation for businesses has been widely studied and being innovative is important in order to maintain or create a competitive advantage (Adner & Levinthal, 2001; Porter, 2008; Marzi & Dabic, 2017). The Organisation for Economic Co-operation and Development (OECD) indicates innovation as the key driver for growth, productivity and well-being (2015). Organizational ambidexterity can be defined as the ability of an organization to simultaneously pursue both discontinuous (exploration) and incremental (exploitation) innovation (O'Reilly & Tushman, 2004). It is a possible way to understand the process of organisational change (O'Reilly & Tushman, 2008. Before, it was often considered that business units could apply just either one and not be able to simultaneously show adaptability (exploration) and alignment (exploitation) within the business unit (Gibson & Birkinshaw, 2004; Christensen & Bower, 1996). More recent literature shows that ambidexterity is possible, does improve performance and might be crucial for long-term survival by balancing explorative and exploitative activities in the organisation (Junni, Sarala, Taras, & Tarba, 2013; O'Reilly & Tushman, 2004; Thongpapanl, de Clercq, & Dimov, 2012).

In 2013, O'Reilly and Tushman raised the question that more research on the role of leadership in managing the contradicting activities of exploration and exploitation is needed. O'Reilly and Tushman (2013) describe that other aspects of ambidexterity, such as boundary conditions and crossing levels of analysis have been largely attended in current research, but the effect of leadership is less clear. Rosing et al. (2011) already proposed a model to investigate this role of leadership. Rosing et al. (2011) argued that explorative behaviour of employees can be achieved through an opening leadership style. An opening leadership style is associated with encouraging employees to experiment, think independently and challenge routines (Rosing et al., 2011). A closing leadership style results in a more exploitative behaviour. Where closing leadership consists of taking corrective action and monitoring goal achievement (Rosing et al., 2011). Zacher et al. (2016) based their study on this model of Rosing et al. and found a positive significant effect of opening leadership on explorative employee behaviour and a positive significant effect of closing leadership on exploitative employee behaviour. In addition, high explorative and exploitative employee behaviour leads to an increase of innovative performance of employees (Zacher et al., 2016).

According to Birkinshaw & Gupta (2013) every business unit is dealing with both exploitation and exploration, but on a different level. Meaning that e.g., the R&D department can be responsible for product development, the manufacturing site still has to improve its process and might need new (explorative) ways to do this. Birkinshaw and Gupta (2013) therefore argue that no organization unit does only one 'thing'. Following their argument suggests that all managers (low to high management) deal with both types of activities. However, in most studies the datasets consist mostly of higher educated leaders, with an undergraduate degree or higher, and often in high changing environments (Luu, 2017; O'Reilly & Tushman, 2011; Zacher et al., 2016). This leaves the question if ambidextrous leadership is also in place for lower educated leaders and in slow changing environments. The manufacturing industry is often considered a slow changing environment and Junni et al.

(2013) showed that exploitation and exploration separately had a significant positive effect on performance, but organizational ambidexterity on performance showed no significant effect. Performance was measured using objective measures and perceptual measures, the effect of organizational ambidexterity on objective performance was not significant whereas the effect on perceptual performance was positive and significant (Junni et al., 2013). So, the effect of an ambidextrous organization is more visible among employees (perceptual) than in actual numbers (objective), such as profit. This effect is shown using all industries, if this is applicable for the manufacturing industry was not specifically mentioned by Junni et al. (2013).

Current literature shows that the impact of a leader is important, and that the performance of an organization is increased when explorative and exploitative behaviour is high. However, these studies are often done among higher educated leaders or high management of an organization. Since little research has been done on ambidextrous leadership among lower educated leaders, there was no assumption the effect is different from higher educated leaders.

Therefore, this study examined the effect of leadership style from lower educated leaders on ambidextrous behaviour from lower educated employees and if this affects their innovative performance. The researcher expected to find similar results as from the study by Zacher et al. (2016). By doing so, this study will contribute to the literature on ambidextrous leadership and innovative performance. The results will give insight for leaders into what extent their leadership style impacts the innovative behaviour of their employees and how they can influence this behaviour.

The central research question for this thesis will be: **"To what extent does the leadership style of lower educated leaders affect the innovative performance of lower educated employees in the manufacturing industry?"**

This study was performed at Ten Cate Grass (TCG) Thiolon. TCG is a manufacturer of artificial grass for sports and landscaping. TCG is an example of a manufacturing company that wants to improve its current activities and also tries to focus on more long-term innovations and improvements. The business unit for this study was the Yarns factory in Nijverdal of Ten Cate Grass. Besides the development of new products from the R&D department the factory also made some large investments in production which are being realised in 2021. E.g. a new dosing system of the raw materials, which results in a new working method and extension of the responsibilities of the employees. This can be considered an explorative investment, because it is a completely new process for the organization. Higher management of TenCate Grass wants to know if lower management and the employees are capable of contributing to this type of changes.

Theoretical and practical contribution

The findings of this study complement existing research on ambidextrous leadership, by applying the model suggested by Zacher et al. (2016). Researchers have started to study

ambidextrous leadership more after the call of O'Reilly and Tushman (2013) and recent research shows that ambidextrous leadership is important to achieve ambidexterity in an organization. Since research on ambidextrous leadership has mostly focussed on high changing environments and a higher management level, this thesis will contribute to the literature about ambidextrous leadership in manufacturing and lower management. This study will provide more information on how leaders influence the innovative performance of their team members. As far as the researcher knows, there has not been a specific study on ambidextrous leadership of lower management.

Research into ambidextrous leadership among lower educated employees can provide new insight for organizations as TCG on what they can expect from their lower management. This thesis will give more insight for higher management if lower management is able to change between both leadership styles and how this influences the innovative performance of their employees. Innovation is of great importance for future growth and performance of on organisation (Hogan & Coote, 2014). The outcome can contribute to better decision making of higher management if e.g. a more structural form of ambidexterity suits better on this level of the organization. Because leadership styles are rated among different items, this study might also help organizations to better support their team leaders on how they can improve their leadership skills. The results will also show the strengths and weaknesses of employee behaviour and will provide valuable insight in how the organization can improve itself and its employees.

2. Literature review

Exploration and exploitation

In the 1970's the term 'organizational ambidexterity' was first introduced in the literature and argued that for long-term success organizations should consider two structures, exploration and exploitation (O'Reilly & Tushman, 2008; Raisch & Birkinshaw, 2008). The objective of organizational ambidexterity is to strive for efficient management for todays demands, but also being adaptive for changes in the environment (Gibson & Birkinshaw, 2004). After the 1970's, this research field was gaining more interest and according to Garcia-Lillo, Ubeda-Garcia and Marco Lajara (2016) the most influential studies came from March (1991), Gibson and Birkinshaw (2004) and multiple works from O'Reilly and Tushman (e.g. 2004; 2008). March (1991) found that organizations often struggle with finding equilibrium between explorative and exploitative activities. Table 1 presents the definitions given by multiple scholars, of which the work of March (1991) is the most-cited in this research field (Garcia-Lillo et al., 2016). The definition given by March (1991) will be used in this study.

Exploration	**Exploitation**
• Exploration includes things captured by terms such as search, variation, risk taking, experimentation, play, flexibility, discovery, innovation (March, 1991, p.71). • In general, exploration is associated with organic structures, loosely coupled systems, path breaking, improvisation, autonomy and chaos, and emerging markets and technologies (He & Wong, 2004, p. 481). • Exploration consists of idea generation and creativity, an "outside the box" thinking approach (Rosing, Frese, & Bausch, 2011).	• Exploitation includes such things as refinement, choice, production, efficiency, selection, implementation, execution (March, 1991, p.71). • Exploitation is associated with mechanistic structures, tightly coupled systems, path dependence, routinization, control and bureaucracy, and stable markets and technologies (He & Wong, 2004, p. 481). • Exploitation is about idea implementation and requires efficiency, goal orientation and routine execution (Rosing et al., 2011).

Table 1 – multiple definitions of exploration and exploitation

As O'Reilly and Tushman (2013) express, studies on ambidexterity can be difficult to compare as the interpretation of the concepts 'exploration' and 'exploitation' can differ between studies and participants. Nevertheless, scholars mostly agree on exploitation being more important than exploration in slow changing environments, such as the manufacturing industry (e.g. De Visser et al., 2010; Junni et al., 2013).

In their meta-analysis, Junni et al. (2013) found a positive significant effect of exploitation and exploration on overall performance in the manufacturing industry. However, in contradiction to these relationships they could not find a significant effect of OA on overall performance in this industry. Junni et al. (2013) included both objective and perceptual measures in the overall performance measure because the studies reviewed used these two types of performance measures. Junni et al. (2013) found that the effect of OA on the objective measures is mostly not significant where the effect of OA on perceptual measures is always positive and significant (Junni et al., 2013). A similar effect was found at the relationship between exploration, exploitation and performance. So, exploitation and exploration had a positive significant effect on perceptual performance but not on objective performance. The perceptual performance was measured through self-evaluation, so it can be argued that the effect of ambidexterity on its employees is therefore stronger than for the organization (growth, profit).

Ambidexterity

Ambidexterity can be divided into three categories (Garcia-Lillo et al., 2016; O'Reilly & Tushman, 2013). First, 'sequential ambidexterity', which suggests that organizations should sequentially use different organizational structures to come to higher performance (Siggelkow & Levinthal, 2003). Because *"even if a system is not decomposable, one still may usefully break it apart— temporarily"* (p. 665). Meaning that firms can switch their attention between exploration and exploitation for periods of time, mostly effective at project level (Chen, 2017). The second category is 'structural ambidexterity', which structurally separates exploitation and exploration into subunits in an organization which are coordinated by managers (O'Reilly & Tushman, 2008; Chen, 2017). The subunits do have a shared strategic intent, values and linking mechanisms to fully use shared assets. The third category is 'contextual ambidexterity'. Gibson and Birkinshaw (2004) describe contextual ambidexterity as *"the behavioral capacity to simultaneously demonstrate alignment and adaptability across an entire business unit"* (p. 209). Opposed of structural ambidexterity, contextual ambidexterity is not structured in the organization, but can be seen as a capability that is embedded in the individuals instead of the organization (Garcia-Lillo et al., 2016). O'Reilly and Tushman (2011) mention that even though each characteristic of ambidexterity is important, it appears that the interaction of components define the capabilities behind effective contextual ambidexterity. Successful business units are able to develop this capacity for effective ambidexterity by "aligning themselves around adaptability" (p.221, Gibson & Birkinshaw, 2004).

In the search for ambidexterity, it can be difficult for organizations to actually achieve ambidexterity. Raisch et al. (2009) come up with four interrelated tensions that need to be addressed in future research to provide more clarity for organizations' search towards ambidexterity. A tension consists of two contradicting approaches on how ambidexterity can be implemented. The first tension relates to achieving ambidexterity through differentiation or integration, in which differentiation refers to the separation of exploration and exploitation in different units. Opposite to that, integration is about enabling units to do be exploitative

and explorative. The first tension can also be linked to the three categories above, differentiation is either a form of sequential or structural ambidexterity and integration is similar to contextual ambidexterity. Raisch et al. (2009) suppose that there is difficulty in choosing the right category for an organization. The second tension that needed more research according to Raisch et al. (2009) is if ambidexterity is more expressed on organizational or individual level. The third tension is on viewing ambidexterity static or dynamic. The static view gives a hard division between exploration and exploitation, the dynamic is opposite. The fourth tension relates to internal and external ambidexterity. External tries to acquire new knowledge from outside the organization, whereas internal only addresses exploitation and exploration internally (Raisch et al., 2009).

O'Reilly and Tushman (2013) and Junni et al. (2013) extensively evaluated the effect of ambidexterity on firm performance. O'Reilly and Tushman (2013) come up with three conclusions based on their research on existing literature, first and maybe most important, ambidexterity is positively associated with firm performance. Secondly, it seems that under uncertain conditions ambidexterity is more beneficial for firm innovation and financial performance as in stable conditions. Finally, there is evidence that the under- or overuse of either side of ambidexterity comes at the cost of the other side and no equilibrium is reached. Overall, the conclusion seems that organizational ambidexterity is positively associated with a higher performance and increase in innovation (O'Reilly and Tushman, 2013).

Leadership and ambidexterity

In the literature on ambidexterity there has been an increased call for research on how leaders are coping with ambidexterity. Especially on leaders' behaviour in meeting the contradicting demands of exploitation and exploration, or opening and closing leadership styles (Anderson, 2014; Kassotaki, 2019; O'Reilly and Tushman, 2013). Definitions of opening and closing leadership styles are given in table 2. Luu (2017) looked at the effect of ambidextrous leadership on entrepreneurial orientation and operational performance (Luu, 2017). Entrepreneurial orientation involves risk taking, proactiveness and innovativeness, which drives employees to improve processes linked to operational performance (Luu, 2017). Operational performance comprises of process flexibility, production lead time, product or service quality, and delivery reliability (Devaraj et al, 2007; Luu, 2017). Luu (2017) found a direct positive effect of ambidextrous leadership on entrepreneurial orientation and a positive indirect effect on operational performance.

O'Reilly and Tushman (2011) had a different perspective and investigated the role of leadership in making ambidexterity a dynamic capability. O'Reilly and Tushman (2011) have the following view on dynamic capabilities, *"With dynamic capabilities, sustained competitive advantage comes from the firm's ability to leverage and reconfigure its existing competencies and assets in ways that are valuable to the customer but difficult for competitors to imitate" (p. 6).*

O'Reilly and Tushman (2011) investigated the impact of five conditions they proposed which should make ambidexterity more successful. These conditions are based on earlier research by O'Reilly and Tushman in 2008. The five conditions are:

- A compelling strategic intent that intellectually justifies the importance of both exploration and exploitation
- An articulation of a common vision and values that provide for a common identity across the exploitative and exploratory units
- A senior team that explicitly owns the unit's strategy of exploration and exploitation; there is a common-fate reward system; and the strategy is communicated relentlessly
- Separate but aligned organizational architectures (business models, structure, incentives, metrics, and cultures) for the exploratory and exploitative units and targeted integration at both senior and tactical levels to properly leverage organizational assets
- The ability of the senior leadership to tolerate and resolve the tensions arising from separate alignments

O'Reilly and Tushman (2011) found that in successful ambidextrous designs, leaders developed a clear vision and common identity, built teams that were committed to this strategy, employed aligned subunits to focus on either exploration or exploitation and created teams that could deal with conflicts between exploration and exploitation and the resource allocations. O'Reilly and Tushman (2011) suggest that successful ambidextrous organizations managed to overcome struggles in the components about strategic execution. These components *"require hard choices about resource allocation, leader behavior, senior team composition (or replacement), and the balancing of contradictory organizational architectures" (p. 18)* (O'Reilly & Tushman, 2011). In executing the strategy, leadership plays an important role and it seems that the dynamic capabilities that push effective ambidextrous designs are defined by the interaction of these components (O'Reilly & Tushman, 2011).

In 2011, Rosing et al. proposed a model to test the effect of ambidextrous leadership on innovation. In this model ambidextrous leaderships consists of three elements. The first element is opening leadership style, second is closing leadership style and the third is the capability of a leader to switch between those styles when necessary (Rosing et al., 2011). Multiple definitions of opening and closing leadership are given in table 2, this study uses the definition given by Rosing et al. (2011). This is chosen because Rosing et al. (2011) define a 'set' of behaviours that leaders can use and therefore suggest a leader never uses one behaviour type, but always multiple.

Opening leadership style	Closing leadership style
• We define "opening leader behavior" as a set of leader behaviors that includes encouraging doing things differently and experimenting, giving room for independent thinking and acting, and supporting attempts to challenge established approaches (Rosing et al, 2011, p. 967). • Through opening behaviour a leader can "unfreeze" old values of its employees and activate the transition to entrepreneurial values (Luu, 2017). • Leader opening behaviour involves actions that increase variance in employee behaviour, such as allowing for errors, encouraging alternative methods for task accomplishment, and motivating employees to take risks (Zacher et al., 2016, p. 25).	• We define "closing leader behavior" as a set of leader behaviors that includes taking corrective action, setting specific guidelines, and monitoring goal achievement (Rosing et al, 2011, p. 967). • Through closing behaviour a leader can "refreeze" the new values of its employees (Luu, 2017). • Leader closing behaviour, on the other hand, involves actions that focus on decreasing variance in employee behaviour, such as establishing routines, ensuring rules are followed, monitoring whether goals are attained, and taking corrective action when necessary (Zacher et al., 2016, p. 25).

Table 2 – multiple definitions of opening and closing leadership

The theory suggests that team innovation is highest when both leadership behaviours are high (Rosing et al., 2011). Zacher and Rosing (2013) tested this model and their results support this theory. Meaning that when leaders are able to switch between both behaviours on a high level, they are successful in encouraging their team members to be innovative.

Zacher et al. (2016) used a similar model to test opening and closing behaviour of leaders on innovative performance as displayed in Figure 1. A difference between the studies is how innovation is measured. Zacher and Rosing (2013) as well as Zacher et al. (2016) used a four-item innovative performance scale, developed by Welbourne et al. (1998). But Zacher and Rosing (2013) had team leaders rate their teams using this scale and Zacher et

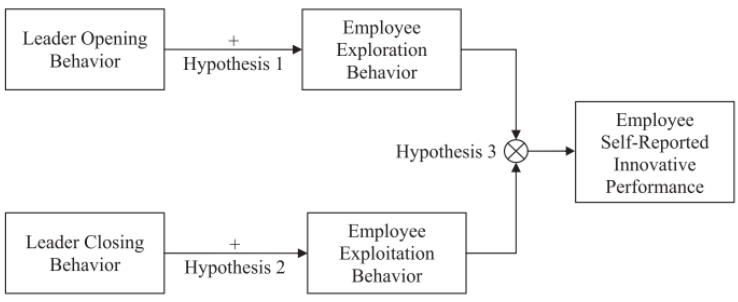

Figure 1 – conceptual model of Zacher et al. (2016)

al. (2016) asked the employees to rate their own innovative performance. The results of Zacher et al. (2016) showed that leader opening behaviour is positively related to employee exploration behaviour, supporting hypothesis 1. The results also support hypothesis 2, that leader closing behaviour is positively related to employee exploitation behaviour. Zacher et al. (2016) also found that high exploration and exploitation behaviour leads to a higher innovative performance, supporting hypothesis 3. In other words, high opening and closing behaviour (ambidextrous leadership) from leaders has a positive impact on employees' innovative performance.

3. Development of hypotheses

Most studies on the subject of ambidexterity and ambidextrous leadership are based on data sets from non-manufacturing firms and are often focused on a higher management level (e.g. O'Reilly & Tushman, 2011; Zacher & Rosing, 2013; Luu, 2017). Birkinshaw and Gupta (2013) suggest that on every level of the organization there is always some form of exploration and exploitation and the struggle to switch between both behaviours. "There is no unit, in other words, that does only one thing" (p. 294) is the conclusion Birkinshaw and Gupta (2013) draw from their research. Meaning that all managers should find a balance between explorative and exploitative activities, even if an R&D department is responsible for exploration in an organization, the manufacturing facility still has to seek for process improvements (Birkinshaw & Gupta, 2013).

Following this argumentation from Birkinshaw and Gupta, it can be assumed that a similar positive effect of ambidextrous leadership on innovative performance is in place for a lower management level and within a manufacturing setting. This might be contradicting to e.g., Junni et al. (2011), who showed that the effect of organizational ambidexterity on performance in the manufacturing industry is not positive and significant. However, in that study the two individual items (exploration and exploitation) explaining organizational ambidexterity do have a positive and significant effect on performance and especially on perceptual performance. Linking this to the results from Zacher et al. (2016), the fact that the effect on perceptual performance was higher than the overall performance could indicate that employees' exploitation and exploration behaviour was positively influenced by leadership behaviour.

Following the reasoning of Zacher et al. (2016), leader opening behaviour gives employees room for errors and independent thinking. These are crucial elements for exploration behaviour in which creativity and "outside the box" thinking is important. On the other hand, there is closing leadership behaviour, where the objective is to reduce variances and to create standardized working methods. This is also the basis for exploitation behaviour, in which process efficiency takes a central place. The lack of studies on ambidextrous leadership from lower management leaves a starting point for this study, to investigate if the outcome of Zacher et al. (2016) will be the same in different circumstances. In order to answer the central research question, this study will use the same hypotheses (Zacher et al., 2016, p.30-31). Figure 2 provides a schematic overview of the variables and the hypotheses used in this study.

Hypothesis 1: Leader opening behaviour of lower management is positively related to employee exploration behaviour of lower educated employees within the manufacturing industry.

Hypothesis 2: Leader closing behaviour of lower management is positively related to employee exploitation behaviour of lower educated employees within the manufacturing industry.

Hypothesis 3: The interaction between employee exploration and exploitation behaviours predicts employee self-reported innovative performance, such that self-reported innovative performance is highest when both exploration and exploitation behaviour are high.

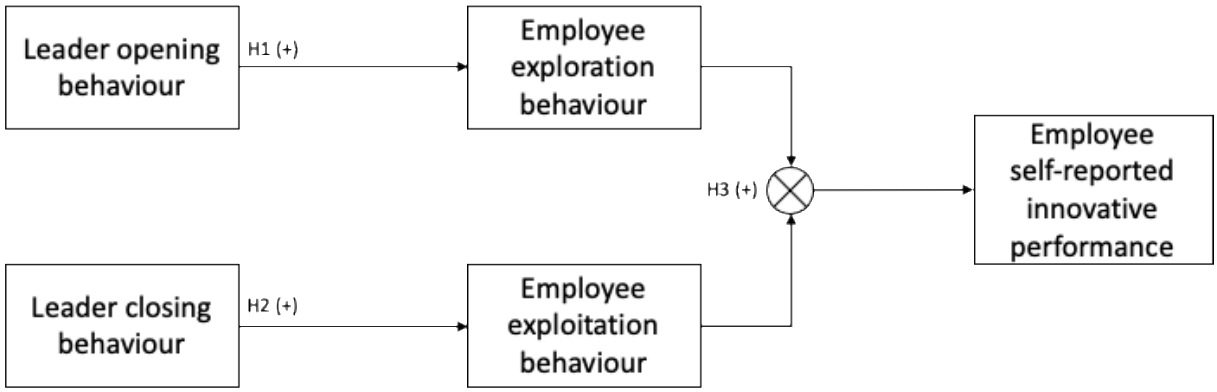

Figure 2 – schematic overview of variables and hypotheses

4. Methodology

Data collection

The data for this study came from employees from one manufacturing plant, producing artificial grass fibres. The employees are divided among five different teams and each team has a team leader. A total of 100 surveys were handed out to employees working for Ten Cate Grass for at least three months. To ensure a high response rate, the survey will be printed for every employee. The researcher personally handed out the surveys to the employees and together with TenCate Grass a room will be made available so the employees can fill in the survey. In total 90 participants filled in the survey, resulting in a 90% response rate.

Since it was expected that the level of English among the employees is not sufficient to answer all questions on the survey. The survey was translated to Dutch. To ensure that the translation is correct, back-to-back translation was applied (Alghamdi, 2018). A pilot of the survey was held among five employees to check if questions were unclear. It was not necessary to make any changes to the survey. A copy of the survey (in Dutch) can be found in Appendix A.

Measures

The following measures were used to test the conceptual model. Cronbach's alpha will be used to test the reliability. In previous studies with these measures, Cronbach's alpha was not lower than .82 (Zacher & Rosing, 2013; Zacher et al., 2016).

Self-reported innovative performance

Employees will be asked to rate their own innovative performance by using a 4-item scale from Welbourne, Johnson and Erez (1998). This self-reported innovative performance as validated by Welbourne et al. (1998) and also successfully used in the studies of Zachter et al. (2016), Bono and Judge (2003) and Chen (2005). Also, as Junni et al. (2013) showed, the effect of ambidexterity on the perceptual measures was positive and significant. This is a role-based performance scale for rating employees. The four items are: "Coming up with new ideas", "Working to implement new ideas", "Finding improved ways to do things", "Creating better processes and routines" (Welbourne et al., 1998). Answers can be given through a Likert scale ranging from 1 (needs much improvement) to 5 (excellent).

Opening and closing behaviours

To measure the opening and closing behaviours, the employees will be asked to rate their team leaders on a two-scale rating developed by Zacher et al. (2016). There will be a 5 point Likert scale in the range from 1 (not at all) to 5 (always). Regarding opening behaviour the items asked will be "Motivates to take risks", "Allows different ways of accomplishing a task", "Gives possibilities for independent thinking and acting", "Encourages experimentation with different ideas", "Gives room for own ideas", "Allows errors", and "Encourages error learning". Closing behaviour will be tested by the items "Monitors and controls goal

attainment", "Takes corrective action", "Established routines", "Controls adherence to rules", "Sticks to plans" and "Sanctions errors".

Employee exploration and exploitation behaviours

Mom et al. (2007) developed and validated scales to measure both behaviours by using a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The items referring to exploration behaviour are "Evaluating diverse options with respect to my work", "Activities requiring me to be adaptable", "Searching for new possibilities with respect to my work", "Focusing on strong renewal of products/services or processes" and "Activities requiring me to learn new skills or knowledge". Regarding exploitation behaviour the items are "Activities which serve existing customers with existing products/services", "Activities primarily focused on achieving short-term goals", "Activities in which I have accumulated a lot of experience", "Activities which clearly fit into existing company policy", "Activities which I clearly know how to conduct" and "Activities I can properly conduct using my existing knowledge".

Demographic variables

Some general information and demographic variables were asked from the employees to provide insight in the sample population. Educational level and team number will be used as a control variable. Team number to control for the impact of individual team leaders and educational level to control for higher educated employees. Employees will report their gender (1 = male and 2 = female), age in years, education (0 = no education, 1 = primary school, 2 = VMBO/MAVO, 3 = HAVO, 4 = VWO, 5 = MBO 1, 6 = MBO 2, 7 = MBO 3, 8 = MBO 4, 9 = University (of applied sciences)), team number, years employed (0 = 0 to 5 years, 1 = 5 to 10 years, 2 = 10 to 20 years, 3 = more than 20 years).

Data validation

Before analyzing the data using ADANCO (Henseler & Dijkstra, 2015), the data was tested on validity and reliability. Firstly the reliability of the constructs was tested. This resulted in very high Cronbach's alphas (> 0.89) and very high Jöreskog's rho's (> 0.83). Dijkstra-Henseler's rho (ρ_A) was very high (> 0.92) for all constructs except closing leadership behaviour (0.4852). A ρ_A above 0.707 is considered reasonable and indicates that more than 50% of the variance in the construct scores is explained by the underlying items (Benitez et al., 2020).

In evaluating the indicator reliability the factor loadings should be 0.707 or higher, a lower loading does not have to be problematic as long as the reliability and validity of the construct meets its criteria (Benitez et al., 2020). For multiple items the indicator reliability was lower than 0.707, these were mostly found in the constructs of Opening leadership behaviour, Closing leadership behaviour and Employee exploitation behaviour. Before acting on these low scores, the validity of the constructs is analysed.

The AVE shows how much of the indicators' variance is explained by the construct and should be higher than 0.5 (Benitez et al., 2020). All constructs show a higher AVE than 0.5 except Closing leadership behaviour, which has an AVE of 0.4592. In extend to the AVE, the

Heterotrait-Monotrait Ratio of Correlations (HTMT) indicates if constructs are statistically different from each other and should be lower than 0.85 to have discriminant validity (Benitez et al., 2020). The constructs in this model do not show a HTMT higher than 0.85.

Analysis of the factor and cross loadings shows that item 'takes corrective item' is similarly loaded on the construct closing leadership behaviour (0.4532) as well as on opening leadership behaviour (0.4042). Item 'Activities requiring me to learn new skills or knowledge' also has a similar loading with two constructs, namely employee exploration behaviour (0.7398) and employee exploitation behaviour (0.6648). Construct reliability scores above 0.95 might indicate that the items of a construct are redundant and therefore reduce validity (Diamantopoulos, 2012; Hair et al., 2017; Hair et al., 2019). That is why further evaluation was necessary. Item 'sanction errors' had the highest weight (0.7264) on construct employee closing behaviour and had too much power in comparison to the other items , therefore this item was removed. Looking at the cross loadings item 'activities which I clearly know how to conduct' had a negative loading (-0.0368) on employee closing behaviour and largely influences the ρ_A of leadership closing behaviour. Therefore this item was removed as well. Lastly, item 'Activities primarily focused on achieving short-term goals' was removed because of its weight on construct employee exploitation behaviour. These changes in the data set improved the construct reliability greatly, table 3 shows the construct reliability in which all values are above the threshold 0.707 (Benitez et al., 2020). There was also improvement at the AVE, where employee exploration behaviour changed from 0.7658 to 0.8423, leadership closing behaviour went up from 0.4592 to 0.6944 and employee exploitation behaviour went up from 0.6216 to 0.6464. So that all AVE's are now above 0.5.

Construct	Dijkstra-Henseler's rho (ρA)	Jöreskog's rho (ρc)	Cronbach's alpha(α)
Leadership opening behaviour	0,9244	0,9079	0,8833
Leadership closing behaviour	0,9185	0,9004	0,8678
Employee exploration behaviour	0,9461	0,9552	0,9376
Employee exploitation behaviour	0,8674	0,8795	0,8304
Self-reported innovative performance	0,9188	0,9316	0,9026

Table 3 – Construct reliability

Table 4 provides the discriminant validity through HTMT and shows that all constructs are statistically different from each other while all values are below the threshold of 0.85 (Benitez et al., 2020).

Construct	Leadership opening behaviour	Leadership closing behaviour	Employee exploration behaviour	Employee exploitation behaviour
Leadership closing behaviour	0,6395			
Employee exploration behaviour	0,4446	0,2227		
Employee exploitation behaviour	0,1254	0,0797	0,6441	
Self-reported innovative performance	0,6398	0,3756	0,6474	0,2998

Table 4 – Discriminant validity: HTMT

Data analysis

As mentioned before, for the analysis of the data the program ADANCO is used. ADANCO is based on partial least squares path modelling(PLS-PM). In order to test an interaction effect using PLS-PM, Fassot et al. (2016) suggests two approaches, the orthogonalizing approach and

the two-stage approach. Henseler (2017) advices users of ADANCO to use the two-stage approach for modelling interaction effects, originally developed by Chin et al. (2003). The two stages are as follows (Henseler & Chin, 2010; Henseler, 2017):

> Stage 1: Run the model without interaction effect, this will calculate the construct scores for the latent variables. Extract and save the construct scores.
> Stage 2: Built the interaction term as a product of the two construct scores. Run the model with the interaction effect included.

Fassot et al. (2016) recommends to use centered construct scores in the two-stage approach. Therefore , the unstandardized construct scores were saved and centered by subtracting their respective mean. Then the interaction effect was created by multiplying the centered scores of employee exploration behaviour and employee exploitation behaviour.

5. Results

For presentation purposes were the items and constructs renamed, an overview of this is given in Appendix B. The results of the two stages are shown in figure 3 and figure 4, computed by ADANCO.

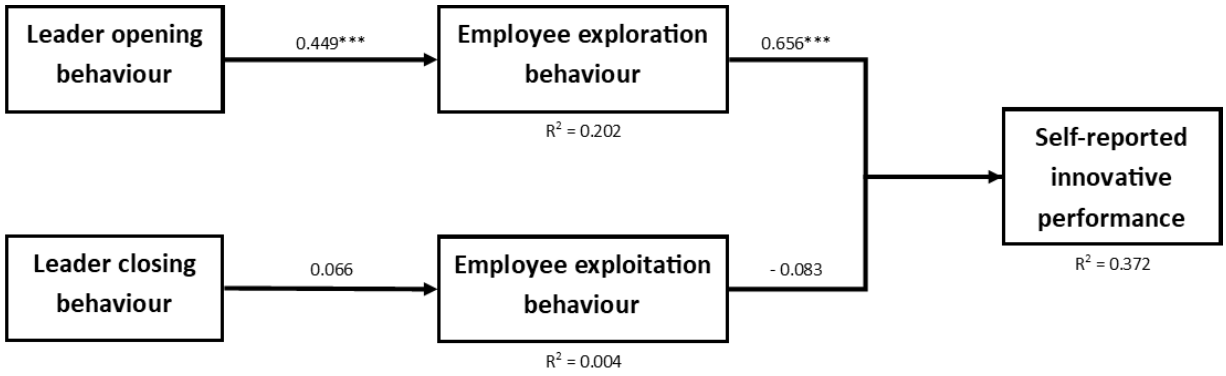

Figure 3 – result of stage 1

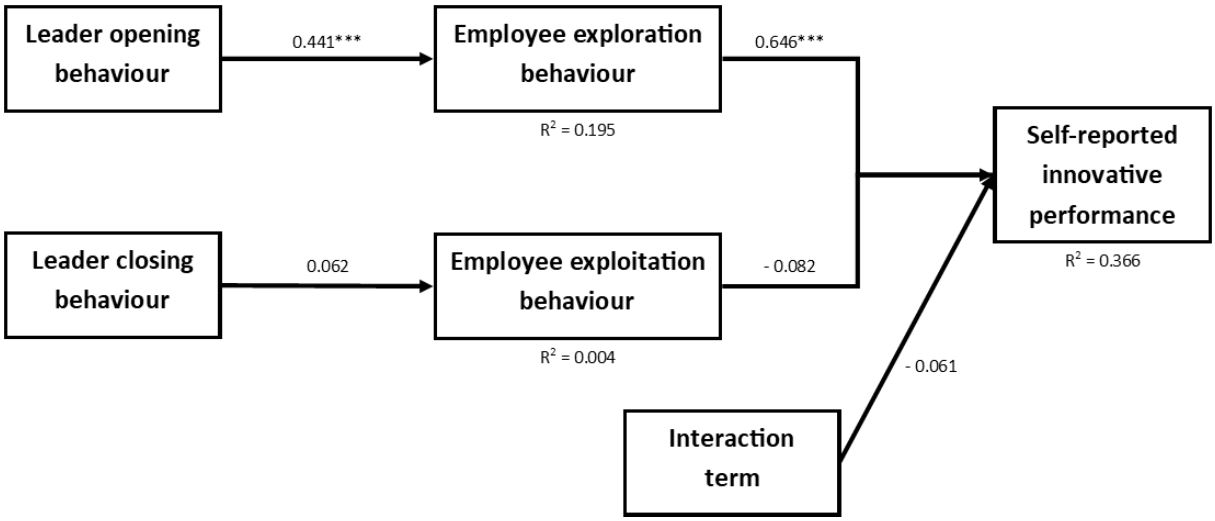

Figure 4 – result of stage 2

Other data of the resulting constructs is shown in table 5 and table 6. For all items the minimum was is 1 and the maximum is 5. Table 5 shows that all constructs are close to the middle value of 3. Leader closing behaviour has the highest mean value of 3,75 and employee exploration behaviour has the lowest mean value of 2,57. More detailed descriptive statistics can be found in Appendix C. In terms of correlation, table 6 shows that employee exploration and exploitation are highly positively correlated (0.600). Self-reported innovative performance is also highly positively correlated with employee exploration behaviour (0.607) and with employee exploitation behaviour (0.311). Self-reported innovative performance and leader opening behaviour show a positive correlation as well (0.601). Leader opening behaviour is positively correlated with leader closing behaviour (0.564) and employee exploration behaviour (0.450). This correlation with employee exploration behaviour provides some preliminary support for hypothesis 1. Leader closing behaviour is weakly correlated with employee exploration behaviour (0.170) and moderately correlated with self-reported innovative performance (0.328). There are two other weaker correlations, between employee

exploitation behaviour and leader opening behaviour (0.126) and employee exploitation behaviour and leader closing behaviour (0.066). The weak correlation between leader closing behaviour and employee exploitation behaviour might indicate that there is no support for hypothesis 2. The stronger correlated relations with self-reported innovative performance provide preliminary support for hypothesis 3.

Variable	M	SD
1 Leader opening behaviour	3,17	1,16
2 Leader closing behaviour	3,75	0,95
3 Employee exploration behaviour	2,57	1,18
4 Employee exploitation behaviour	3,10	1,18
5 Employee self-reported innovative performance	3,00	1,00

Table 5 – Means (M) and Standard Deviations (SD)

Variable	1	2	3	4	5
1 Leader opening behaviour	(0,588)				
2 Leader closing behaviour	0,564	(0,694)			
3 Employee exploration behaviour	0,450	0,170	(0,842)		
4 Employee exploitation behaviour	0,126	0,066	0,600	(0,646)	
5 Employee self-reported innovative performance	0,601	0,328	0,607	0,311	(0,773)

Average variance extracted (AVE) is provided in parentheses along the diagonal

Table 6 – Inter-construct correlations

Control variables

The first was to control for team number. To do this, the method provided by Henseler (2012) was followed. Hereby the data set is divided into five different data sets, based on the team number. However, the sample size was too small for ADANCO to successfully execute this model and no result was given. The second control variable was educational level, the data set was split at 'MBO 2' level to provide an even sample size. This analysis provided similar results with both groups as the original model and a significant effect was found between leader opening behaviour and employee exploration behaviour and self-reported innovative performance. Also, no significant effect of leader closing behaviour on employee exploitation behaviour and self-reported innovative performance was found.

Test of hypothesis

The results of the two-stage approach are shown in Figure 3 and Figure 4. Hypothesis 1 states that leader opening behaviour is positively related to employee exploration behaviour. This hypothesis is supported by the model with $\beta = 0.441$ and $p < 0.001$. The share of variance explained in the dependent construct employee exploration behaviour is $R^2 = 0.195$.

Hypothesis 2, leader closing behaviour is positively related to employee exploitation behaviour, is not supported by the model. There is no significance ($p = 0.604$) and the effect is also weak ($\beta = 0.062$). The share of variance explained in the dependent construct employee exploitation behaviour is $R^2 = 0.004$.

Hypothesis 3 states that the interaction between employee exploration and exploitation behaviours predict employee self-reported innovative performance. After computing stage 2, no support was found for this hypothesis. As Figure 4 shows, there was only a positive significant effect of employee exploration behaviour on self-reported innovative performance ($\beta = 0.646$, $p < 0.001$). Employee exploitation behaviour ($\beta = -0.082$ and $p = 0.546$) and the interaction effect of employee exploitation and exploration behaviour showed no significant effect ($\beta = -0.061$ and $p = 0.535$). The share of variance explained in the dependent construct self-reported innovative performance is $R^2 = 0.366$.

In addition to the hypothesis, there are two indirect effects in this model. The effect of leader opening behaviour on self-reported innovative performance is significant ($p < 0.01$) and also moderately strong ($\beta = 0.285$). The effect of leader closing behaviour on self-reported innovative performance is not significant ($p = 0.786$) and weak ($\beta = -0.005$).

6. Discussion

The goal of this study was to elaborate on the current literature of ambidextrous leadership on innovation and also to provide higher management of Ten Cate Grass insight in how lower management deals with innovation. The initial conceptual model was based on the model proposed by Zacher et al. (2016). The results of this study are partly different than expected. Zacher et al. (2016) and Rosing et al. (2011) argue that employee exploitation behaviour should boost the positive effect of employee exploration behaviour on self-reported innovative performance and employee exploration behaviour should boost the effect of leader closing behaviour on self-reported innovative performance. However, where employee exploration behaviour does exactly as expected. No significant effect of employee exploitation behaviour or the interaction term on innovative performance was found. The indirect effect of leader closing behaviour on self-reported innovative performance was also not significant, so it seems that self-reported innovative performance is not determined by either leader closing behaviour or employee exploitation behaviour. In an attempt to find a situation that better fits the conceptual model, two more tests with the same items have been executed as well.

Construct and item scores

Looking at the scores given for the constructs and the different items, multiple scores stand out. In line with the current literature, leader closing behaviour was scored higher (mean = 3,66) than of leader opening behaviour (mean = 3,20). And exploitation behaviour (mean = 3,08) scored higher than exploration behaviour (mean = 2,66). This indicates that employees show more exploitative behaviour than explorative behaviour. Looking specifically at the scores of exploitation behaviour, two items scored lower than 3. Item “Activities primarily focused on achieving short-term goals” (mean = 2,81) and item “Activities which serve existing customers with existing products/services” (mean = 2,28). At Ten Cate Grass the employees work in shifts and a large part is repetitive work. Therefore it was expected that these items would score higher, because there is little change in customers and the short-term goals are the same every shift. This could insinuate that employees are not aware of why their work is important. The item ‘gives room for own ideas’ has a mean value of 3,23 and is the item with the highest variance (1,54). This might show that employees are divided about this topic, especially since the mean value lies close to the centre value 3 of the Likert scale and the variance is considerably high. The distribution of this

Overall, the construct scores are in line with current literature on exploitation and exploration activities. Where organisations in manufacturing industry are more focussed on exploitation than on exploration (e.g. Junni et al., 2013). However, the results contradict with the results from Zacher et al. (2016) and Rosing et al. (2011) on ambidextrous leadership. Therefore it is necessary to provide more insight in the outcome, by discussing the results with the team leaders.

Reflection with team leaders

In this session the team leaders had to fill in the same survey, on the constructs of opening and closing leadership behaviour they had to reflect on themselves. For the items on exploration and exploitation behaviour as well as innovative performance they had to reflect on their team. After presenting the results of the original survey with the employees, the team leaders were asked to compare these with their own survey and look for differences or similarities. The team leaders noted that they try to use a more open leadership style because they want their employees to come up with new ideas. The team leaders are looking for a dialogue when it comes to setting structure and when new rules or working methods have to be implemented. Because they are afraid if they use a more closing style, no ideas will come from the employees and their motivation will drop.

Analysing the results, team leaders scored themselves high on the items “Encourages experimentation with different ideas” (mean = 3,6) and “Gives room for own ideas” (mean = 4,6). Contradicting is how low they scored themselves on the items “Motivates to take risks” (mean = 2). On one side there is a lot of motivation from the team leaders to be innovative, however these ideas should have a very low risk. On the items from closing leadership they all scored themselves high (mean = 4,5). When asked about this, seemingly, contradicting result a considered explanation came forward. Because of the continuous extrusion process in the manufacturing plant and the pressure of performing there is not much room for error, otherwise the costs will be very high and the team leader is responsible for that. The team leaders take into account that because of the lower level of employees, their ideas can have an impact on the quality of the product or the performance of the machines. The employees don’t always oversee the effects of their individual actions. Therefore the team leaders want to limit this room for error and filter alle ideas before implementing, so no actual error can occur during production. The team leaders decide which idea is good and which is not. This limitation in room for error only partly reaches the employees, they scored item ‘motivates to take risks’ at mean value 3 with a variance of 1,4. So not all employees are aware that the team leaders do not want them to take risks.

Another interesting difference is that the team leaders rated their own team higher on innovative performance (mean = 4,1) than the employees did themselves (mean = 3,0). An explanation can be found on the difference in team and individual level. Team leaders at Ten Cate Grass manage teams between 17 (low season) and 25 (high season) employees, not everyone in a team has the same level of innovative performance. It is a possibility that only a few of them come up with all ideas and the rest does not have any. Therefore the perceived team level of innovative performance can be higher than the individual level of innovative performance as reported by the employees.

Finally, coming back at the items “Activities primarily focused on achieving short-term goals” and “Activities which serve existing customers with existing products/services” which were scored lower by the employees. The team leaders interpreted this outcome that, because of old age and low maintenance, the machines and equipment are broken quite

often. This results in a feeling from the employees that they cannot serve the customers as good as they want.

Overall, even though the team leaders proclaim to show more opening leadership behaviour, they really are using a closing leadership style. The respective means are 3,2 and 4,5. The effect of closing leadership and employee exploitation behaviour on self-reported innovative performance was not found to be significant. With the explanation from the team leaders it can be argued that closing leadership and employee exploitation behaviour are however a necessity or precondition for the team leaders to use a more opening leadership style. This opening leadership style will then, boosted by employee exploration behaviour result in a higher innovative performance of an employee.

7. Contributions and conclusion

The findings of this study suggest that in manufacturing and with lower educated employees there is an important role for the team leader. This person is the key to control higher management goals such as production output and quality of the product as well as the filter between new ideas from employees to a possible solution of a problem. This study provides the academic field with more data on ambidextrous leadership and suggests that a closing leadership style as well as an interaction between opening and closing leadership does not have an effect on the innovative performance of employees. Innovative performance is only affected by an opening leadership style. Closing leadership is present to a large extent and can be considered the foundation for lower management of a manufacturing plant. Based on efficient working methods and following the guidelines provides team leaders the opportunity to motivate their employees to come up with new ideas within this framework.

This study provides organisations valuable insight on leader selection and training processes. Organisations should be aware that, if they want to improve their innovative performance, they should choose leaders who have closing and opening leadership qualities. Leadership is an important antecedent of innovation and leaders could and should be made aware of their influence (Zacher & Rosing, 2015). In addition, leaders should know the difference between opening and closing leadership styles and what the effect of both styles is on innovative performance. This could be discussed in a training with the leaders, where also the importance of the items should be addressed. For example on ‘gives room for own ideas’, ‘motivates to take risks’ and ‘encourages error learning’.

In conclusion, the results of this study provided more insight in the field of ambidextrous leadership, specifically on lower management. Even though no significant effect was found of closing leadership on innovative performance it is still a necessary skill for a leader. In order to improve innovation and innovative performance of its employees, leaders should reach a higher level of opening behaviour. More research is now needed to further explore this academic field and it is hoped that this study will be a useful addition.

8. Limitations and future research

This study has some limitations that should be addressed for improving future research. First, the sample size of 90 respondents was relatively small. Even though the reliability and validity of this study scored high, a small sample size can increase sampling error. A strong and significant effect in this study, supporting on of the hypothesis, counters that a large sample size is obligatory. However, future research with larger samples is desirable and can provide a more representative view on ambidextrous leadership.

Secondly, for measuring innovative performance this study relied on employee self-reports while it was not possible to asses innovative performance in a more objective way (through e.g. patents, projects started/finished). Asking employees to score their own performance may give biased results because people over- or underestimate themselves and may give social desirable answers. Some researchers argue that self-reporting measures are no problem and employees are capable of rating their own performance (Welbourne, 1998; Bono & Judge, 2003; Shalley, Gilson & Blum, 2009; Zacher & Rosing, 2015). Other scholars have argued that self-reporting measures are not always a good representation of the actual innovative performance (Nemeth & Ormiston, 2007; Reiter-Palmon et al., 2012). The discussion on self-reporting measures on innovation is often a debate of reliability, there are advantages as well as disadvantages in using this method.

Thirdly, in addition to previous limitation, there was limited time in discussing the results with the team leaders. This may not have given a complete picture on the thoughts of the team leaders on the results. For future research, more in-depth interviews with the team leaders individually may give more insights in the working methods that could better explain the results from the survey. Also a more extended group-session with the whole team and their team leader to discuss the results could be organised.

At last, an interesting point for future research could be to further study the effect of team leaders on filtering all ideas of the employees before further exploring them. It could be argued that this heavily disturbs the innovative mindset and process of the employees.

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Appendix A

Interview questions (Dutch)

Geslacht:
O Man O Vrouw

Leeftijd:

_____

Hoogst afgeronde opleiding:
O Geen opleiding
O Basisschool
O VMBO/MAVO
O HAVO
O VWO
O MBO 1
O MBO 2
O MBO 3
O MBO 4
O HBO/Universiteit

Team nummer:

_____

Jaren werkzaam:
O 0 – 5 jaar
O 5 – 10 jaar
O 10 – 20 jaar
O Langer dan 20 jaar

Geef aan in hoeverre jij vindt dat je hier mee bezig bent:

Ik kom met nieuwe ideeën
O O O O O
(nooit) (zeer vaak)

Ik help mee met het implementeren van nieuwe ideeën
O O O O O
(nooit) (zeer vaak)

Ik ben op zoek naar manieren om dingen beter te doen

O O O O O

(nooit) (zeer vaak)

Ik bedenk en ontwerp verbeterde processen en routines

O O O O O

(nooit) (zeer vaak)

Geef aan in hoeverre jouw teamleider

Je motiveert om risico's te nemen

O O O O O

(nooit) (altijd)

Jou toestaat een taak om op een andere manier uit te voeren

O O O O O

(nooit) (altijd)

Jou de mogelijkheid geeft om onafhankelijk te denken en te werken

O O O O O

(nooit) (altijd)

Je motiveert om te experimenteren met nieuwe ideeën

O O O O O

(nooit) (altijd)

Jou ruimte geeft voor eigen ideeën

O O O O O

(nooit) (altijd)

Jou toestaat om fouten te maken

O O O O O

(nooit) (altijd)

Je motiveert om te leren door fouten te maken

O O O O O

(nooit) (altijd)

Geef aan in hoeverre jouw teamleider

De team/bedrijfsdoelen doelen bijhoudt en controleert

O O O O O

(nooit) (altijd)

Corrigerende maatregelen neemt bij fouten

O O O O O

(nooit) (altijd)

Standaard routines (werkzaamheden) bedenkt

O O O O O

(nooit) (altijd)

Controleert op naleving van de regels

O O O O O

(nooit) (altijd)

Vasthoudt aan de gemaakte plannen

O O O O O

(nooit) (altijd)

Fouten bestraft

O O O O O

(nooit) (altijd)

Geef aan in hoeverre je hebt meegewerkt aan de volgende werk-gerelateerde activiteiten

Evalueren van diverse opties met betrekking tot producten of processen

O O O O O

(In kleine mate) (In grote mate)

Zoeken naar nieuwe mogelijkheden met betrekking tot producten of processen

O O O O O

(In kleine mate) (In grote mate)

Focussen op het vernieuwen van producten of processen

O O O O O

(In kleine mate) (In grote mate)

Activiteiten die aanpassingsvermogen hebben gevergd

O O O O O

(In kleine mate) (In grote mate)

Activiteiten waarbij ik nieuwe kennis of skills moest opdoen

O O O O O

(In kleine mate) (In grote mate)

Geef aan in hoeverre je hebt meegewerkt aan de volgende werk-gerelateerde activiteiten

Activiteiten gericht op het halen van korte termijn doelen

O O O O O

(In kleine mate) (In grote mate)

Activiteiten die ik mijzelf heb aangeleerd

O O O O O

(In kleine mate) (In grote mate)

Activiteiten die bestaande (interne) klanten bedienen

O O O O O

(In kleine mate) (In grote mate)

Activiteiten waarvan duidelijk is dat je die beheerst

O O O O O

(In kleine mate) (In grote mate)

Activiteiten die je met je huidige kennis goed kunt uitvoeren

O O O O O

(In kleine mate) (In grote mate)

Activiteiten die passen bij het huidige bedrijfs beleid

O O O O O

(In kleine mate) (In grote mate)

Geef aan in welke mate je het eens bent met de volgende stellingen

Ik kan vertrouwen op de collega's binnen Yarns

O O O O O

(In kleine mate) (In grote mate)

Collega's binnen Yarns houden over het algemeen rekening met andermans gevoelens

O O O O O

(In kleine mate) (In grote mate)

Collega's binnen Yarns hebben vertrouwen in elkaar

O O O O O

(In kleine mate) (In grote mate)

Collega's binnen Yarns zijn integer

O O O O O

(In kleine mate) (In grote mate)

Er is geen sprake van team spirit binnen Yarns

O O O O O

(In kleine mate) (In grote mate)

In het algemeen zijn de collega's binnen Yarns betrouwbaar

O O O O O

(In kleine mate) (In grote mate)

Geef aan in welke mate je het eens bent met de volgende stellingen

Collega's hebben dezelfde ambities en visie voor Yarns

O O O O O

(In kleine mate) (In grote mate)

Collega's streven gezamenlijk en enthousiast naar de doelen van Yarns

O O O O O

(In kleine mate) (In grote mate)

Er is een gemeenschappelijk doel tussen de collega's van Yarns

O O O O O

(In kleine mate) (In grote mate)

Collega's zijn toegewijd om de doelen van Yarns te behalen

O O O O O

(In kleine mate) (In grote mate)

Iedereen draagt bij aan het richting geven van Yarns

O O O O O

(In kleine mate) (In grote mate)

Iedereen is in volledige overeenstemming over de visie van Yarns

O O O O O

(In kleine mate) (In grote mate)

Appendix B

Construct (theory)	Item (theory)	Construct (Adanco)	Item (Adanco)
Leader opening behaviour	Motivates to take risks	Opening behaviour	A_1
Leader opening behaviour	Allows different ways of accomplishing a task	Opening behaviour	A_2
Leader opening behaviour	Gives possibilities for independent thinking and acting	Opening behaviour	A_3
Leader opening behaviour	Encourages experimentation with different ideas	Opening behaviour	A_4
Leader opening behaviour	Gives room for own ideas	Opening behaviour	A_5
Leader opening behaviour	Allows errors	Opening behaviour	A_6
Leader opening behaviour	Encourages error learning	Opening behaviour	A_7
Employee exploration behaviour	Evaluating diverse options with respect to my work	Employee exploration	B_1
Employee exploration behaviour	Searching for new possibilities with respect to my work	Employee exploration	B_2
Employee exploration behaviour	Focusing on strong renewal of products/services or processes	Employee exploration	B_3
Employee exploration behaviour	Activities requiring me to be adaptable	Employee exploration	B_4
Employee exploration behaviour	Activities requiring me to learn new skills or knowledge	Employee exploration	B_5
Leader closing behaviour	Monitors and controls goal attainment	Closing behaviour	C_1
Leader closing behaviour	Takes corrective action	Closing behaviour	C_2
Leader closing behaviour	Established routines	Closing behaviour	C_3
Leader closing behaviour	Controls adherence to rules	Closing behaviour	C_4
Leader closing behaviour	Sticks to plans	Closing behaviour	C_5
Leader closing behaviour	Sanctions errors	Closing behaviour	C_6
Employee exploitation behaviour	Activities primarily focused on achieving short-term goals	Employee exploitation	D_1
Employee exploitation behaviour	Activities in which I have accumulated a lot of experience	Employee exploitation	D_2
Employee exploitation behaviour	Activities which serve existing customers with existing products/services	Employee exploitation	D_3
Employee exploitation behaviour	Activities which I clearly know how to conduct	Employee exploitation	D_4
Employee exploitation behaviour	Activities I can properly conduct using my existing knowledge	Employee exploitation	D_5
Employee exploitation behaviour	Activities which clearly fit into existing company policy	Employee exploitation	D_6
Employee self-reported innovation	Coming up with new ideas	Innovative performance	Y_1
Employee self-reported innovation	Working to implement new ideas	Innovative performance	Y_2
Employee self-reported innovation	Finding improved ways to do things	Innovative performance	Y_3
Employee self-reported innovation	Creating better processes and routines	Innovative performance	Y_4

Appendix C

Descriptive statistics

Indicator	Minimum	Maximum	Mean	Variance	Skewness	Kurtosis
Y_1	1	5	3	0,846153846	-0,304186734	0,245939793
Y_2	1	5	2,835443038	0,908471276	0,065834863	-0,228686201
Y_3	1	5	3,278481013	1,100941253	-0,380865827	-0,322221815
Y_4	1	5	2,860759494	1,147030185	-0,036553354	-0,649428816
A_1	1	5	3	1,435897436	0	-0,75511599
A_2	1	5	3,227848101	1,255111977	-0,297963298	-0,655097253
A_3	1	5	3,481012658	1,17591691	-0,506989195	-0,345266453
A_4	1	5	3,113924051	1,435572866	-0,270609594	-0,778283449
A_5	1	5	3,227848101	1,537163259	-0,323628837	-0,744710397
A_6	1	5	3,063291139	1,393378773	-0,125205328	-0,791573568
A_7	1	5	3,164556962	1,318727686	-0,174856919	-0,686774513
C_1	1	5	3,670886076	0,94157741	-0,499133406	0,062323332
C_3	1	5	3,632911392	0,799415774	-0,523067389	0,074912778
C_4	1	5	4	0,948717949	-0,768652152	0,049985346
C_5	1	5	3,835443038	0,908471276	-0,754457603	0,584220298
B_1	1	5	2,82278481	1,455371633	-0,278754959	-0,947671064
B_2	1	5	2,53164557	1,329113924	0,075371816	-0,883571352
B_3	1	5	2,493670886	1,278805583	0,125237882	-0,974664402
B_4	1	5	2,607594937	1,395326193	0,09493696	-0,891247359
D_2	1	5	3,253164557	1,268419344	-0,464281906	-0,359124153
D_3	1	5	2,278481013	1,306069458	0,327682637	-1,116503249
D_5	1	5	3,632911392	1,030185005	-0,787493613	0,542867829
D_6	1	5	3,35443038	0,872768582	-0,579176604	0,449951079