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Ing. Reinhard Rigler, BSc

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Declaration

I, Reinhard Rigler, hereby confirm that the following work is my own work unless indicated otherwise. Neither this work nor parts of it have previously been submitted in order to achieve any other degree or qualification.

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Abbreviations

JDI	Job Descriptive Index
MLQ	Multifactor Leadership Questionnaire
MSQ	Minnesota Satisfaction Questionnaire
n/a	not available
TLI	Transformational Leadership Inventory
VBEN	Vienna Behavioral Economics Network

1. Introduction

Leadership and its outcomes have long been in the interest of researchers. Early studies, like the Ohio State leadership studies, even date back to the 1940s (Shartle, 1979). Since then, numerous researchers have developed different theories and concepts about leadership. Many of these researchers tried to classify leadership, to measure it and to distinguish ‘good’ from ‘bad’ leadership. Leadership was evaluated based on outcomes like performance and satisfaction and it was researched in settings all around the world. However, until now there is no agreement on one best way to lead and so the research on leadership continues to grow.

But, the topic of leadership and its outcomes does not only attract attention in academics. For example, a recent survey by Deloitte Austria (Brence, Nowshad, Wallner & Bauer, 2019) revealed that in Austria the number one reason for employees to leave their employer is the dissatisfaction with the leadership. The same study reports that the average fluctuation cost amounts to almost 15,000 euro per job depending on the company size. Hence, the topic of leadership and subordinate satisfaction represents an interesting topic for practitioners too.

Nevertheless, researchers and practitioners alike drown in leadership literature. Every year the collection of books, articles and reports grows. The number of hits for leadership literature in research databases has already grown to millions. No one is anymore able to make sense of these vast amounts of information. Thus, it is increasingly important to make use of the data that accumulated over years. This thesis aggregates study results and makes use of this data accumulation to derive conclusions regarding leadership and its relation to subordinate satisfaction.

1.1. Background and motivation

Each master thesis begins with the selection of a topic. While some students get assigned a topic, others are privileged to choose one. I belonged to the latter. While choosing the topic was certainly the preferred option for me, it also has its downsides. I learned that choosing an appropriate topic is not always easy. It takes time and thought to finally find one. Moreover, not only has the topic had to be chosen, but also a fitting method had to be found to work on the chosen topic. Months passed, in which several changes and adaptations regarding topic and

method had been made, till I finally found what I wanted to work on. Nevertheless, going through this process resulted in receiving a topic that I was and still am very interested about.

It was one specific event that strongly influenced me during my search of a topic. At that time I saw a video published by the VBEN (Vienna Behavioral Economics Network). In this video the economist Andrew Oswald from the University of Warwick talked about the topic ‘Happiness and Work’. At one point in his presentation he reported about an interesting finding he and colleagues made in their research. They found that the single strongest predictor of job satisfaction is the boss’s competence (Artz, Goodall & Oswald, 2017). This research finding got stuck in my head and I was wondering how leadership in general would be related to one’s satisfaction at a job.

I was motivated to learn more about this topic and to look at it from different perspectives. I wanted to know which ways there are at all for leaders to lead, what kind of leadership makes workers satisfied and to which kind of leaders to reach out for to find satisfaction at work. Personally, the topic was interesting for me from both sides. As a future employee I wanted to know which leadership traits I should look for during my career to improve the satisfaction I could get from a job. But also as a potential leader, in case I ever should receive the responsibility to lead others in my future career, I was interested in how someone should lead to lead a satisfied team.

Later, I was thinking more broadly about the topic. Leadership does not only affect our working lives, but it affects many facets of our lives. For example, who we vote for to become our political leaders affects the legal framework we are living in and how we act as family leaders – as mothers and fathers – affects the lives of our children. I was then more generally interested in the question ‘*How is leadership related to subordinate satisfaction?*’. I moved away from a pure work-oriented context towards a broader perspective on the topic. Nevertheless, it was this question I wanted to work on in my master thesis.

1.2. Purpose and objectives

The purpose of this thesis is to find answers to the question ‘*How is leadership related to subordinate satisfaction?*’. Even if this question allows to be looked at through the lenses of various scientific disciplines, we will put on the lens of management science to address it. More

specifically, we will focus on the context of organizational behavior in this thesis. This means that although we will go beyond the work-related context, we will limit ourselves to the context of organizations.

Still, answering this question seems to represent a mammoth task. The question is far too broad to answer it precisely in a single thesis. Thus, the objectives of this work are, first, to broadly present an overview of different leadership styles and their relation to subordinate satisfaction and, second, to focus on a few of these leadership styles to answer our question of interest in more detail. In the theory chapter we will go through the process of narrowing down the vast leadership literature to arrive at testable hypotheses. Our hypotheses then shall be tested with a data-driven research method.

Throughout the thesis we will see that the topic of leadership and subordinate satisfaction is far from being an untouched topic. It is a popular and heavily researched topic that has been picked up by many researchers over and over again. At first sight, this makes the topic appear as one where it is difficult to generate new insights or to add something new. But, the fact that this is a heavily researched topic allows us to apply an interesting, data-driven research method. With this method we are indeed able to generate new insights. More specifically, the purpose of this thesis is to aggregate study results from the last one and a half decades and to continue the work of previous key studies in this research area. Hence, this thesis adds to the contemporary research about the relationship between leadership and subordinate satisfaction.

1.3. Thesis structure

Following this introductory chapter 1, the thesis will be structured as follows.

In chapter 2 we present an overview of leadership style typologies and their relation to subordinate satisfaction. We then pick one of these typologies to work on in more detail. We present theory regarding the picked leadership style typology, the concept of subordinate satisfaction and related meta-analytical studies. Finally, we outline our hypotheses.

In chapter 3 we present our research method – the method of meta-analysis. We describe how we conducted our literature search to find articles for our meta-analysis. We show what information

we extracted from the found articles, how we coded this information and what study characteristics the found articles reveal.

In chapter 4 we present our results. We first present the results of a conceptually stricter approach (narrow approach) and show then the results of a less strict approach (broad approach). Based on the broad approach we conduct a more detailed analysis (moderator analysis). The moderator analysis tests the relationships between leadership and subordinate satisfaction with respect to four potential moderators.

In chapter 5 we discuss our findings. We present possible implications for managers and the limitations of this thesis. Finally, we conclude our work briefly.

2. Theory

In this chapter we outline how we move from our initial research question to testable hypotheses by consulting existing literature. For this purpose, we first of all investigate different leadership style typologies and their relation to subordinate satisfaction in section 2.1. We find that the typology of transformational and transactional leadership appears to be one of the most researched typologies in this regard and decided to pick this typology to conduct a meta-analysis. In section 2.2 we describe transformational and transactional leadership in more detail and learn about its structure. On the other side of the relationship of interest resides the term subordinate satisfaction. We analyze the concept of subordinate satisfaction in section 2.3. In section 2.4 we identify and evaluate related meta-analyses. Finally, from our findings about related meta-analyses we derive our hypotheses in section 2.5.

2.1. Leadership style literature and its relation to subordinate satisfaction

The first step to develop an understanding about leadership and subordinate satisfaction is to identify typologies of leadership styles that already have been tested in existing literature with respect to subordinate satisfaction. To do so studies that tested the said relationship were collected and analyzed. The aggregated result of this introductory investigation is presented in Table 1.

Table 1 – Leadership style typologies and their relation to subordinate satisfaction

Leadership styles	N	Directions
Authentic	2	+
Autocratic	2	2
Democratic		1
Consideration	4	+
Initiating structure		mixed
Ethical	2	+
Exploitative (1) / Benevolent (2) / Consultative (3) / Participative (4)	2	+
Participative	3	mixed
Servant	4	+
Transformational	11	+
Transformational	15	+
Transactional		mixed
Others that occurred only once	7	
Sum	52	

Notes: N = Number of studies found.

The result shows that there is a considerable range of leadership style typologies that already have been tested on the topic of subordinate satisfaction. For the rest of this section we will work through the typologies listed in Table 1.

2.1.1. Authentic leadership

Two articles on authentic leadership were identified. Authentic leadership is a form of transparent and ethical leadership that encourages information sharing and the acceptance of follower input (Avolio, Walumbwa & Weber, 2009). Both articles (Wong & Laschinger, 2013; Giallonardo, Wong & Iwasiw, 2010) show that authentic leadership positively influences the job satisfaction of nurses. Moreover, both cases indicate that mediator variables like structural empowerment and work engagement may play an important role in this relationship.

2.1.2. Autocratic and democratic leadership

Also two articles were found on the typology of autocratic vs. democratic leadership. It appears interesting that, even though this typology might be one of the most commonly known typologies for leadership styles, only two articles on this typology were found in our literature search for our overview in Table 1. However, the two articles show interesting results.

Besides the two leadership styles autocratic and democratic leadership, the study by Packard and Kauppi (1999) also investigates the classical leadership style of laissez-faire leadership. Their results are as follows. Satisfaction scores for rehabilitation employees are highest under the democratic leadership style, followed by laissez-faire leadership and autocratic leadership. There are large differences in the scores between the first ranking (democratic) and the second ranking (laissez-faire) leadership style, while scores for the third ranking (autocratic) leadership style are only slightly behind those of the second ranking (laissez-faire) leadership style. Also, the effects appear to be stronger when ‘satisfaction with supervision’ is considered instead of the ‘satisfaction with job in general’ measure.

Similarly, Kuschell and Newton (1986) conducted an experiment with students and show that subordinate satisfaction is higher when democratic leadership is applied as opposed to autocratic leadership. In their work they focus on gender effects and illustrate interesting differences. They show that on the one hand women are far more satisfied with democratic leadership than men, while on the other hand women are more dissatisfied with autocratic leadership than men. According to their results it appears as if women’s subordinate satisfaction is more influenced by leadership styles than men’s.

In Table 1 the directions of these two leadership styles are denominated with 1 and 2 to indicate that democratic leadership (1) ranks before autocratic leadership (2) in terms of higher subordinate satisfaction.

2.1.3. Consideration and initiating structure leadership

Next, we found some more articles on the typology of the consideration and initiating structure leadership styles. This might be due to the fact that the establishment of these leadership styles dates back far into the history of leadership research. The consideration leadership style refers to

“the extent to which the supervisor is considerate of the feelings of those under him”, while the initiating structure leadership style corresponds to *“the extent to which the supervisor facilitates or defines group interactions toward goal attainment”* (Fleishman, 1953, p. 154).

While all four studies (Lok & Crawford, 2004; Pool, 1997; Lok & Crawford, 2001; House, Filley & Gujarati, 1971) reveal positive relationships between consideration leadership and subordinate satisfaction, the studies do not agree on the direction of the relationship between initiating structure leadership and subordinate satisfaction. Lok and Crawford (2004) and Pool (1997) find positive relations, while Lok and Crawford (2001) and House, Filley and Gujarati (1971) find negative relations.

2.1.4. Ethical leadership

Two studies were found on ethical leadership. Ethical leaders behave and act in an honest, trustworthy, fair and caring way (Brown, Treviño & Harrison, 2005). They do not only draw attention to ethics, but actively talk about it, reward ethical behavior, punish unethical behavior and consider ethics when making decisions (Brown, Treviño & Harrison, 2005).

Both studies (Kim & Brymer, 2011; Toor & Ofori, 2009) find a positive relationship between ethical leadership and subordinate satisfaction. Kim and Brymer (2011) find a positive relation for ethical leadership and the job satisfaction of hotel middle managers in the United States, while Toor and Ofori (2009) find that ethical leadership is positively related to the satisfaction with the leader of employees in Singapore’s construction industry. Also, Toor and Ofori (2009) show that ethical leadership is positively related to transformational leadership. This is an interesting point to mention as this work will focus (amongst others) on transformational leadership later on.

2.1.5. Exploitative authoritative, benevolent authoritative, consultative and participative leadership

The next two articles are based on Likert’s (1967) leadership questionnaire, which specifies the four leadership styles ‘exploitative authoritative’, ‘benevolent authoritative’, ‘consultative’ and ‘participative’. The results of the questionnaire usually can be transformed into one score. The higher the score, the closer the leadership style is to the participative leadership style. The lower

the score, the closer the leadership style is to the exploitative authoritative leadership style. Thus, we numbered these four leadership styles in Table 1 from (1) for the exploitative authoritative to (4) for the participative leadership style.

The two studies (Yousef, 2000; Mosadegh Rad & Yarmohammadian, 2006) reveal a positive relation between leadership and subordinate satisfaction, meaning that the closer the leadership style is to participative leadership (the higher the leadership score), the higher the satisfaction. Therefore, we indicated the direction of this typology with a plus in Table 1. Moreover, Yousef (2000) shows that regarding satisfaction leadership interacts with national culture. In the study by Mosadegh Rad and Yarmohammadian (2006) virtually all leaders adapted a participative leadership style, which might limit the validity of their study with respect to all four leadership styles. Nevertheless, they report a statistically significant relation between the leadership style of managers and employees' job satisfaction.

2.1.6. Participative leadership

Further, three articles that did address the topic of participative leadership and subordinate satisfaction were found. The results of these articles regarding the direction of the relationship are mixed. While only the article by Kim (2002) directly addresses the said relationship, the other two articles (Huey Yiing & Zaman Bin Ahmad, 2009; Kahai, Sosik & Avolio, 1997) focus on other relationships in their research, but also report correlations on the said relationship.

Kim (2002) shows that participative leadership style has a positive and significant influence on job satisfaction. Huey Yiing and Zaman Bin Ahmad (2009) investigate amongst others the relationship between organizational commitment and job satisfaction. Nevertheless, they report a negative and significant correlation between participative leadership and job satisfaction. Also, they report negative, significant correlations for supportive and directive leadership with respect to job satisfaction. Kahai, Sosik and Avolio (1997) present the results of a laboratory experiment. They analyzed how leadership styles and problem structure influences group processes and how these group processes in turn affect group outcomes. They do not focus on the direct relationship between participative leadership and subordinate satisfaction. However, they report a positive, non-significant intercorrelation for this relationship. In sum, we found one study that reports a

positive, significant relation, one study that reports a negative, significant relation and one study that reports a positive, non-significant relation.

2.1.7. Servant leadership

Four studies were found on servant leadership. The concept of servant leadership was first defined by Greenleaf in the 1970s (Ding, Lu, Song & Lu, 2012). In essence, a servant leader is described as a leader who focuses first on the needs of his subordinates instead of those of the organization or his own (Jones, 2012).

All four studies (Cerit, 2009; McCann, Graves & Cox, 2014; Jones, 2012; Ding, Lu, Song & Lu, 2012) agree that there is a positive relationship between servant leadership and subordinate satisfaction. Cerit (2009) reports a strong, positive relationship and servant leadership as a strong predictor for teachers' job satisfaction. McCann, Graves and Cox (2014) report a strong, positive correlation between servant leadership and hospital employees' satisfaction. Jones (2012) reports in his qualitative, interview-based study increased employee satisfaction in organizations with servant leaders. Ding, Lu, Song and Lu (2012) report a significant, positive relationship between servant leadership and employee satisfaction. Moreover, they show that employee satisfaction mediates the relation between servant leadership and employee loyalty.

2.1.8. Transformational and transactional leadership – the leadership typology to pick

Towards the bottom of Table 1 there appears a large number of studies about transformational and transactional leadership. Out of the 52 studies that have been identified 26 studies are either on transformational leadership (11 studies) or on transformational and transactional leadership (15 studies). In other words, every second study we found in our literature search for our overview in Table 1 covers the topic of transformational (and transactional) leadership. Thus, we see that in the leadership-satisfaction research area these leadership styles seem to be those for which most research has been conducted so far.

While it is impossible to thoroughly deal with all the different typologies listed above, we had to pick one typology to focus on in this work. Usually a researcher would tend to pick one for which there has been done only little research. She would do so to fill a research gap. However, we decided to go exactly in the opposite direction and pick the one typology where most research

has been done on. In our case this is the typology of transformational and transactional leadership. We do so to be able to apply the research method of meta-analysis, which is applicable to areas where already much research exists. The method of meta-analysis is described in more detail in the next chapter.

From the collected articles on transformational and transactional leadership we derive that the relationship between transformational leadership and subordinate satisfaction is generally positive (e.g. Nielsen, Yarker, Randall & Munir, 2009; Yang, 2009; Gill, Flaschner, Shah & Bhutani, 2010) and that the results for the relationship between transactional leadership and subordinate satisfaction are mixed. There are some studies that report a positive relationship (e.g. Riaz & Haider, 2010; Ghorbanian, Bahadori & Nejati, 2012) and others that report a negative relationship (e.g. Bogler, 2001; Medley & Larochelle, 1995).

2.1.9. Other leadership style typologies

Lastly, Table 1 lists a row, which includes typologies that occurred only once within the collected studies. We do not intend to analyze those in detail, but name a few. Madlock (2008), for example, studies the typology of task and relational leadership with respect to communication and job satisfaction. Sadler (1970) reports about the four leadership styles ‘tells’, ‘sells’, ‘consults’ and ‘joins’ and their relations to job and company satisfaction. Finally, Aydin and Ceylan (2009) investigate the relationship between spiritual leadership and employee satisfaction.

2.2. Transformational and transactional leadership

As described above, we decided to focus this work on the typology of transformational and transactional leadership. Thus, we take a more detailed look at these leadership styles in this section.

2.2.1. The concept of transformational and transactional leadership

The concept of transformational and transactional leadership was first articulated by Burns (1978) in the context of political leadership styles. Burns as cited in Kuhnert and Lewis (1987) describes transactional leadership as a leadership style where transactions and exchange are the tools used by leaders to guide their followers. On the other hand, transformational leadership

goes further and considers the beliefs, needs and values of followers to build deeper relationships between the leaders and their followers. Through mutual stimulation and elevation leaders transform followers and followers eventually become leaders themselves.

Years later, Bass (1985) picked up Burns' concept and developed it further. He claims that transformational and transactional leadership are not two mutually exclusive leadership styles, but that leaders may use behaviors of both styles simultaneously (Hussain, Wan Ismail & Javed, 2017; Asencio, 2016).

In its original form Bass's conceptualization comprised the seven leadership factors "*charisma, inspirational, intellectual stimulation, individualized consideration, contingent reward, management-by-exception and laissez-faire leadership*" (Avolio, Bass & Jung, 1999, p. 441). Over time this conceptualization has undergone several modifications (Avolio, Bass & Jung, 1999). For example, due to problems with the empirical distinctness of the charisma and inspirational leadership dimensions the original model was once reduced to a six factor model. Suggestions were also made to aggregate some of the factors into higher order factors like transformational leadership. There was also discussion about splitting the management-by-exception factor into the two factors management-by-exception active and management-by-exception passive. Then, debate occurred that the dimensions of management-by-exception passive and laissez-faire leadership should be taken together, because there would be a positive correlation between the measures of these two dimensions. All in all, we can see that the concept tends to change slightly over time.

As the work by Judge and Piccolo (2004) is one of the key studies, on which we will build on our work later (see section 2.5 for an explanation why this is the case), we will follow the version of Bass's concept they outline to briefly describe Bass's concept of transformational and transactional leadership. An overview of the version they are describing looks as follows:

- Transformational leadership
 - Charisma / Idealized influence
 - Inspirational motivation
 - Intellectual stimulation
 - Individualized consideration
- Transactional leadership
 - Contingent reward
 - Management by exception – active
 - Management by exception – passive
- Laissez-faire leadership

From this we can derive that there are three distinct leadership styles – transformational, transactional and laissez-faire leadership. Moreover, transformational leadership consists of four subscales, while transactional leadership consists of three subscales in this version.

Charisma or idealized influence is the degree to which the leader is able to make followers to identify with the leader. Inspirational motivation refers to the degree to which the leader inspires his followers through the communication of an appealing vision. Intellectual stimulation describes the degree to which the leader challenges the ideas of his followers and stimulates their creativity. Individualized consideration is the degree to which the leader treats each of his followers as an individual and considers each individual's needs and wishes.

Contingent reward is the degree to which the leader sets out clear expectations and rewards in case the expectations are met. Management-by-exception generally refers to the degree to which the leader makes use of corrective actions based on the outcomes of the leader-follower transactions. The difference between active and passive management-by-exception is that with active management-by-exception the leader takes corrective actions before problems occur,

while with passive management-by-exception the leader takes the corrective actions after problems occurred.

Finally, laissez-faire leadership simply refers to the absence of any leadership at all. In this case leaders avoid taking decisions respectively actions and are often absent.

2.2.2. Common measurement instruments

One of the most commonly used instruments to measure transformational and transactional leadership is the MLQ (Multifactor Leadership Questionnaire) developed by Bass and Avolio (1995). See for example subsection 4.3.1 to get an impression of the frequency of use of the MLQ in the studies analyzed in our meta-analysis.

The MLQ can be purchased for instance via the Mind Garden, Inc. website (Bass & Avolio, 1995). From there, interested parties can also retrieve further information about the MLQ. The instrument has undergone several revisions and is currently (March 2019) structured as follows:

- Transformational Leadership
 - Builds Trust (Idealized Attributes)
 - Acts with Integrity (Idealized Behaviors)
 - Encourages Others (Inspirational Motivation)
 - Encourages Innovative Thinking (Intellectual Stimulation)
 - Coaches & Develops People (Individualized Consideration)
- Transactional Leadership
 - Rewards Achievement (Contingent Reward)
 - Monitors Deviations & Mistakes (Management-by-Exception: Active)
- Passive/Avoidant
 - Fights Fires (Management-by-Exception: Passive)
 - Avoids Involvement (Laissez-Faire)
- Outcomes of Leadership
 - Generates Extra Effort
 - Is Productive (Effectiveness)
 - Generates Satisfaction

As we can see, the current structure deviates marginally from the structure described in the work of Judge and Piccolo (2004). Also, the MLQ does not only measure leadership styles, but measures some leadership outcomes as well. Further, the names of the scales are replaced with names that are easier to understand, perhaps to make it better usable in non-academic contexts. The current version consists of 45 items and takes around 15 minutes to complete. Moreover, there is a great variety of translations available, which facilitates a worldwide use of this instrument.

A second common measurement instrument is the TLI (Transformational Leadership Inventory) developed by Podsakoff, MacKenzie, Moorman and Fetter (1990). According to their paper the structure of the instrument is as follows (pp. 112-113):

- Transformational Leader Behaviors
 - Identifying and Articulating a Vision
 - Providing an Appropriate Model
 - Fostering the Acceptance of Group Goals
 - High Performance Expectations
 - Providing Individualized Support
 - Intellectual Stimulation
- Transactional Leader Behavior
 - Contingent Reward

Comparing the dimensions of this instrument with those of the MLQ, we find that the Identifying and Articulating a Vision dimension of the TLI is similar to the Inspirational Motivation dimension of the MLQ, the Providing Individualized Support dimension of the TLI is similar to the Individualized Consideration dimension of the MLQ, the Intellectual Stimulation dimension of the TLI is similar to the Intellectual Stimulation dimension of the MLQ and the Contingent Reward dimension of the TLI is similar to the Contingent Reward dimension of the MLQ. The remaining three dimensions of the TLI are Providing an Appropriate Model, Fostering the Acceptance of Group Goals, and High Performance Expectations.

Providing an Appropriate Model corresponds to the leader setting an example for followers to refer to, which incorporates the values of the leader. Fostering the Acceptance of Group Goals relates to the leader's effort to make followers cooperate and work together. Lastly, High Performance Expectations measures the leader's expectations of his followers to exert high quality work and high performance.

2.3. Subordinate satisfaction

In this section we take a closer look at the other end of the leadership-satisfaction relationship.

2.3.1. The concept of subordinate satisfaction

The concept of ‘subordinate satisfaction’ itself is conceptually very broad. It may contain a whole range of different satisfaction types. For example, it may contain the subordinate’s satisfaction with his task, with his job, with his career, with his leader, with his peers, or with his life in general. Yet, the term ‘subordinate satisfaction’ highlights something important. Subordinate satisfaction refers to the satisfaction of someone who is led and thus this term is central in our context. Even though the concept appears to be broad, it emphasizes on one specific aspect – the leadership aspect. We did choose this term intentionally to be able to refer to a broader pool of studies initially. Later, we refine our analysis with respect to different types of subordinate satisfaction (see subsection 4.3.2).

For a moment, we want to elaborate the concept of satisfaction. In the Oxford Dictionary the term satisfaction is defined as *“Fulfilment of one's wishes, expectations, or needs, or the pleasure derived from this.”* From this definition we can see that satisfaction is not something that fully depends on exogenous factors such as the behavior of a leader, but it also depends on endogenous factors such as one’s wishes, expectations and needs. Someone who wants to be guided by a leader might be less satisfied with laissez-faire leadership than someone who does not wish guidance by a leader. Someone with high expectations of a leader might be harder to satisfy than someone with low expectations. And, someone who needs to be told what to do might be more satisfied with autocratic leadership than someone who needs to have room for own decisions.

In literature, theories about satisfaction often relate to motivational theory. Classical theories are for example Maslow’s (1943) Theory of Motivation/Satisfaction and Herzberg’s (1959) Two-Factor Theory (Khan, Khan, Nawaz & Qureshi, 2010). What we can learn from Maslow in this respect is once more that satisfaction is highly related to individual needs. While one person seeks to derive satisfaction from fulfilling a physiological need like drinking water, another person might seek to derive satisfaction from fulfilling a love need like building friendship. From Herzberg we can learn that we have to distinguish between satisfaction and dissatisfaction. Even

though his theory relates to work motivation/satisfaction it may be applicable to other contexts. While we might derive satisfaction from some aspects (motivators), we might not derive satisfaction from other aspects, but experience dissatisfaction when these aspects are missing (hygiene factors).

The concept of satisfaction can be applied to many contexts. We find for example research on customer satisfaction (e.g. Szymanski & Henard, 2001), team member satisfaction (e.g. De Dreu & Weingart, 2003), student satisfaction (e.g. Allen, Bourhis, Burrell & Mabry, 2002), relationship satisfaction (e.g. Malouff, Thorsteinsson, Schutte, Bhullar & Rooke, 2010), marital satisfaction (e.g. Twenge, Campbell & Foster, 2003), user satisfaction (e.g. Bokhari, 2005), patient satisfaction (Hall, Blanch-Hartigan & Roter, 2011), and job satisfaction (e.g. Judge, Heller & Mount, 2002).

Referring back again to the term subordinate satisfaction and the fact that this term incorporates a leader-follower relationship, we find that only a few of the above mentioned contexts still fit the concept of subordinate satisfaction. The most important context for us will be the job/work context with the employer-employee relationship. Leadership and its outcomes are often studied on workplace relationships and we expect many studies for our meta-analysis to stem from this context. But, there are also other contexts that become relevant under the concept of subordinate satisfaction. Another context is for example education. Hence, teacher-student relationships represent an additional leader-follower constellation that we will consider in our work. A context that we did not mention so far is sports. With coaches representing leaders to athletes, we also expect to be able to include studies with coach-athlete relationships in our meta-analysis. Thus, even though we assume that the work context will be the main source of studies to include in our meta-analysis, we can see that the term subordinate satisfaction refers to several contexts in which leader-follower relationships are present.

2.3.2. Common measurement instruments

One common instrument to measure subordinate satisfaction is the MLQ (Bass & Avolio, 1995), which we already outlined in the subsection for common instruments to measure transformational and transactional leadership (see subsection 2.2.2). The MLQ does not only measure leadership behavior, but also leadership outcomes. One of these outcomes is the

satisfaction with the leader. So, there are studies that use the MLQ for both, to measure transformational and transactional leadership and subordinates satisfaction (e.g. Gillespie & Mann, 2004; Rowold, 2006). Even though the MLQ offers to measure subordinate satisfaction, other researchers prefer to use other common satisfaction measurement instruments like the MSQ (Minnesota Satisfaction Questionnaire) or the JDI (Job Descriptive Index) (e.g. AL-Hussami, 2008; Ho, 2013; Walumbwa, Wang, Lawler & Shi, 2004; Yang, Wu, Chang & Chien, 2011). Both these instruments measure job satisfaction and thus in contrast to the MLQ are not context independent, but refer to a work-related context.

For the MSQ (Weiss, Dawis, England & Lofquist, 1967) there is a long and a short form. The long form consists of 100 items measuring 20 different scales of job satisfaction. The 20 scales and each scale's most important item are as follows (pp. 1-2):

1. Ability utilization – The chance to do something that makes use of my abilities.
2. Achievement – The feeling of accomplishment I get from the job.
3. Activity – Being able to keep busy all the time.
4. Advancement – The chances for advancement on this job.
5. Authority – The chance to tell other people what to do.
6. Company policies and practices – The way company policies are put into practice.
7. Compensation – My pay and the amount of work I do.
8. Co-workers – The way my co-workers get along with each other.
9. Creativity – The chance to try my own methods of doing the job.
10. Independence – The chance to work alone on the job.
11. Moral values – Being able to do things that don't go against my conscience.
12. Recognition – The praise I get for doing a good job.
13. Responsibility – The freedom to use my own judgement.

14. Security – The way my job provides for steady employment.
15. Social service – The chance to do things for other people.
16. Social status – The chance to be ‘somebody’ in the community.
17. Supervision (human relations) – The way my boss handles his men.
18. Supervision (technical) – The competence of my supervisor in making decisions.
19. Variety – The chance to do different things from time to time.
20. Working conditions – The working conditions.

The five response alternatives for each item are ‘very dissatisfied’, ‘dissatisfied’, ‘neither’, ‘satisfied’ and ‘very satisfied’. The short form consists of the 20 items listed above and results in three different scales of job satisfaction (p. 2):

1. Intrinsic Satisfaction
2. Extrinsic Satisfaction
3. General Satisfaction

The authors estimate 15 to 20 minutes to complete the long form and approximately 5 minutes to complete the short form of the MSQ.

The JDI (Smith, Kendall & Hulin, 1969) is another work-related satisfaction measurement instrument. It measures five scales of job satisfaction (Kinicki, McKee-Ryan, Schriesheim & Carson, 2002, pp. 14-15):

1. satisfaction with work
2. satisfaction with supervision
3. satisfaction with coworkers
4. satisfaction with pay
5. satisfaction with promotion

The items of this instrument are single words or short phrase and can be answered with ‘Y’ if the word or phrase describes the asked characteristic of a job, with ‘N’ if it does not and ‘?’ if the respondent is not sure whether or not the word or phrase applies to the asked characteristic. The full questionnaire can also be downloaded free of charge from the Bowling Green State University’s website.

2.4. Related meta-analyses

Before we conduct a meta-analysis on transformational and transactional leadership and their relation to subordinate satisfaction, we check if already other meta-analyses have been performed on this or similar topics. Indeed, we could identify a number of other meta-analyses covering the topic of transformational and transactional leadership and their outcomes.

Fuller, Patterson, Hester and Stringer (1996) performed a meta-analysis on charismatic leadership, a scale of transformational leadership (see section 2.2). They report results for the relationships of charismatic leadership and performance, effectiveness and satisfaction with the leader. In all three cases they find a positive relationship, with the relationship referring to satisfaction with the leader being the strongest among the three.

Lowe, Kroeck and Sivasubramaniam (1996) performed a meta-analysis on transformational and transactional leadership with respect to leader effectiveness. In their overall meta-analysis they report positive relationships between the five subscales charisma, individualized consideration, intellectual stimulation, contingent reward and management-by-exception and the outcome variable of leader effectiveness. No results regarding subordinate satisfaction are reported.

Similarly to the meta-analysis by Fuller, Patterson, Hester and Stringer (1996), DeGroot, Kiker and Cross (2000) also performed a meta-analysis on charismatic leadership. They report results for a variety of relationships between charismatic leadership and leadership outcomes, including subordinate job satisfaction. For all tested outcomes they find a positive relationship with charismatic leadership.

Dumdum, Lowe and Avolio (2002) performed a detailed meta-analysis on transformational, transactional and laissez-faire leadership. They report results for subscales as well as aggregated scales of these leadership styles. Regarding subordinate satisfaction they find positive

relationships for the aggregated scale and the subscales of transformational leadership, positive relationships for the aggregated scale and the contingent reward subscale of transactional leadership, negative relationships for the management-by-exception subscales of transactional leadership, and a negative relationship for laissez-faire leadership.

Eagly, Johannesen-Schmidt and Van Engen (2003) performed a meta-analysis on transformational, transactional and laissez-faire leadership and focused on the differences between women and men in the use of these leadership styles. Their main result is that women use transformational leadership and contingent reward behavior slightly more than men, while men use management-by-exception behavior and laissez-faire leadership slightly more than women. In contrast to the other meta-analyses that we present here, they use *d* values in their meta-analysis instead of correlations. This makes their meta-analysis methodically different to the other meta-analyses and the meta-analysis we perform in this work.

Judge and Piccolo (2004) also performed a meta-analysis on transformational, transactional and laissez-faire leadership. They report results for a mixture of subscales and aggregated scales of these leadership styles with respect to a variety of leadership outcomes. For different measures of subordinate satisfaction their results are as follows. They find positive relationships for the aggregated scale of transformational leadership, positive relationships for the contingent reward subscale of transactional leadership, mixed results for the management-by-exception subscales of transactional leadership, and negative relationships for laissez-faire leadership.

Wang, Oh, Courtright and Colbert (2011) performed a meta-analysis on transformational and transactional leadership with respect to different variables of performance (e.g. task performance, contextual performance, creative performance). In general, they report positive relationships for the aggregated scale of transformational leadership and mixed results for the subscales of transactional leadership. No results regarding subordinate satisfaction are reported.

Lastly, Aydin, Sarier and Uysal (2013) performed a meta-analysis on transformational, transactional and laissez-faire leadership. They only report results for the aggregated scales of these leadership styles. Their results regarding subordinate job satisfaction are as follows. They find a positive relationship for transformational leadership, a positive relationship for

transactional leadership and a negative relationship for laissez-faire leadership. A noteworthy point about their work is that they only included Turkish studies in their meta-analysis.

We summarize our findings about related meta-analyses in Table 2.

Table 2 – Related meta-analyses

Meta-analysis	Leadership styles	Directions ¹⁾
Fuller, Patterson, Hester & Stringer (1996)	Charismatic	+
Lowe, Kroeck & Sivasubramaniam (1996)	Transformational Transactional	n/a
DeGroot, Kiker & Cross (2000)	Charismatic	+
Dumdum, Lowe & Avolio (2002)	Transformational Transactional Laissez-faire	+ mixed –
Eagly, Johannesen-Schmidt & Van Engen (2003)	Transformational Transactional Laissez-faire	n/a
Judge & Piccolo (2004)	Transformational Transactional Laissez-faire	+ mixed –
Wang, Oh, Courtright & Colbert (2011)	Transformational Transactional	n/a
Aydin, Sarier & Uysal (2013)	Transformational Transactional Laissez-faire	+ + –

Notes: n/a = not available. ¹⁾ Directions with respect to subordinate satisfaction.

2.5. Hypotheses

With our findings about related meta-analyses at hand, we now want to derive the hypotheses for this thesis. We intend to research the relationships between transformational and transactional leadership (including laissez-faire leadership) and subordinate satisfaction. Thus, the meta-analyses by Dumdum, Lowe and Avolio (2002), Judge and Piccolo (2004), and Aydin, Sarier

and Uysal (2013) represent the main meta-analyses of interest to us. But, they already studied what we try to study in this thesis. So, what can we contribute with our work?

Since Aydin, Sarier and Uysal (2013) only included Turkish studies in their meta-analysis and before them Judge and Piccolo (2004) conducted the latest meta-analysis on this topic, our aim is to build upon the work of Judge and Piccolo (2004) and to deliver contemporary research. The latest study included in the meta-analysis by Judge and Piccolo (2004) is from 2002. Therefore, we will include in our analysis only studies from 2003 onwards to study the last one and a half decades on this topic.

Derived from the findings of the three predecessor meta-analyses, we propose the following hypotheses:

- H1: Transformational leadership will have a positive, nonzero relationship with subordinate satisfaction.
- H2: Transactional leadership will have a positive, nonzero relationship with subordinate satisfaction.
- H3: Laissez-faire leadership will have a negative, nonzero relationship with subordinate satisfaction.

3. Research method

To test our proposed hypotheses this thesis takes advantages of the quantitative research method called meta-analysis. The meta-analysis method is explained in more detail in section 3.1. As we base our analysis on the Hunter-Schmidt method of meta-analysis, section 3.1 predominantly relies on the second edition of the book by Hunter and Schmidt (2004). To find the studies that provide data for our meta-analysis, a literature search has been conducted, which is described in section 3.2. In section 3.3 the extraction and coding of information from the identified studies is illustrated and study characteristics are outlined.

3.1. Meta-analysis

Meta-analysis is a method to aggregate results across studies. In contrast to a narrative review, which qualitatively compares the results of different studies, a meta-analysis refers to a more quantitative approach of analysis (Hunter & Schmidt, 2004). Simply illustrated, a meta-analysis takes the results of different studies regarding a certain research topic and tries to find out the overall result for the examined research topic. For example, one might be interested in the relationship between a certain leadership style and the subordinates' satisfaction. Assume there are several studies reporting correlation coefficients on this relationship, some reporting a positive correlation, others reporting a negative correlation. For the researcher it then would be interesting what the overall result would look like considering all the existing study results. Is the overall relation positive or negative? What is the effect size of the overall relationship? This is what we can use the method of meta-analysis for. We are able to integrate several study results to find out the aggregated result about a research topic, or with respect to our example, the aggregated relation between the variables of a leadership style and subordinate satisfaction.

Compared to the narrative review, the meta-analysis method provides some advantages. First, meta-analyses consider differences in study results that may be artifactual (Hunter & Schmidt, 2004). For example, Hunter and Schmidt (2004) show in their book how different results on the relationship between organizational commitment and job satisfaction could be interpreted with typical practices used in narrative reviews and outline an exemplary narrative review. The conclusion of their exemplary review is that the relationship presumable depends on the age of the workers and the size of the organization. However, the conclusions derived from their

exemplary narrative review were false, because all the differences between the studies were constructed and are the result of sampling errors. The population correlation in all studies was chosen to be the same. Thus, they show that conflicting results might stem (even entirely) from study imperfections. While narrative reviews do not account for this fact, meta-analyses do.

A second major advantage is that meta-analyses generally can and do consider a larger number of studies (Hunter & Schmidt, 2004). Within a narrative review, especially in textbooks, usually only a few studies are taken and compared to each other. This is because it is impracticable to discuss dozens or even hundreds of studies on a single relationship in a narrative review. Therefore, often only a few studies that are considered representative for a research field are taken to draw conclusions on. This can lead to differences in the conclusions of different narrative reviews covering the same research topic, as the different reviews might be based on different ‘key’ studies. Meta-analyses, on the other hand, allow incorporating the results of a large number of studies. They make it possible to aggregate a large number of results in an organized, structured and meaningful way. As Glass (1976, p. 4) puts it: “[*The meaning of hundreds of studies on a research topic*] can no more be grasped in our traditional narrative, discursive review than one can grasp the sense of 500 test scores without the aid of techniques for organizing, depicting, and interrelating data.” Also, when a meta-analysis is conducted on the basis of a large number of studies its results should be more reliable compared to the results of a narrative review, which is based on only a few studies. Further, the chances of arriving at different conclusions should be reduced by considering larger numbers of studies.

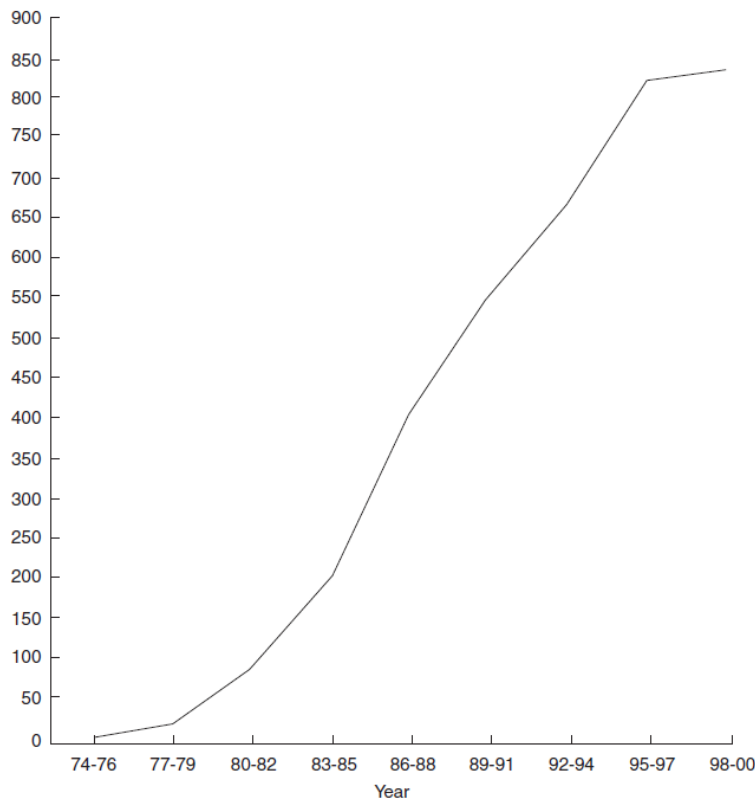
3.1.1. Importance of meta-analysis

With the growing amount of study results that are generated it becomes increasingly important to summarize existing results rather than to generate new ones. Hunter and Schmidt (2004, p. 16) are convinced that “*in many areas of research, the need today is not for additional empirical data but for some means of making sense of the vast amounts of data that have been accumulated.*” This makes methods like meta-analysis increasingly important.

This increasing importance of meta-analysis as a research method is also reflected in the appearance of meta-analyses in research databases. Figure 1 depicts the number of articles published between 1974 and 2000 in the PsycInfo database containing the term ‘meta-analysis’

in their title or abstract (Hunter & Schmidt, 2004, p. 25). The term first appeared in the database between 1974 and 1976 and the number of appearances rose to over 800 by 1998-2000. Towards the end of the time frame depicted in Figure 1 it seems as if the number of articles flattens out, but this impression is deceptive. A recent search (January 2019) in the same database for articles including the term ‘meta-analysis’ in their title or abstract for the time slot 2016-2018 revealed a result of over 7,000 articles.

Figure 1 – Number of articles in PsycINFO database with ‘meta-analysis’ in title or abstract, 1974–2000



Source: Hunter & Schmidt, 2004, p. 25.

Finally, we also want to emphasize the importance of meta-analysis by powerful statements made by some prominent researchers. Glass (1976, p. 8), for example, who was involved in shaping the concept of meta-analysis, wrote: “[...] we find ourselves in the mildly embarrassing

position of knowing less than we have proven. The proofs reside in a vast literature that is often superciliously scorned and insufficiently respected.” Even though we produce enormous amounts of information, we often miss to extract the valuable inherent knowledge. With the method of meta-analysis we increasingly are able to make use of data generated by the vast literature.

Thomas Chalmers (as cited in Hunter & Schmidt, 2004, p. 32), a prominent medicine researcher, claimed: “[*Meta-analysis*] is going to revolutionize how the sciences, especially medicine, handle data. And it is going to be the way many arguments will be ended”. Meta-analysis being able to produce one integrated outcome out of several study results represents a powerful method. Imagine a situation where some researchers argue about the relationship between two variables. While some researchers might argue that the relationship between the two variables has to be positive (according to their study results), some other researchers might claim that the relationship between the two variables has to be negative (according to their study results). In such a situation we face one’s word against another’s. With the method of meta-analysis we are able to resolve such situations by aggregating existing study results and retrieving an overall result for the relationship. Thus, meta-analysis has the potential to end long-lasting research disputes.

3.1.2. The choice of a meta-analysis method

In literature there are different methods of meta-analysis that can be followed. With the topic of this work we are moving in the research area of organizational behavior. This research area can also be referred to as the psychology of organizations (Daft, 2010). Common methods of meta-analysis applied in this and related research areas are listed in Table 3. Table 3 also lists the frequency of use of these methods in two industrial/organizational psychology journals in the period 1974-2000. What we can derive from Table 3 is that the Hunter-Schmidt method clearly appears to be the dominant method in this research field.

Table 3 – Substantive meta-analyses published in the top two journals in industrial/organizational psychology by methods used, 1974–2000

Method	Journal of Applied Psychology	Personnel Psychology
Hunter-Schmidt	77%	82%
Hedges-Olkin	2%	6%
Rosenthal-Rubin	5%	0%
Glass	1%	0%
Mixed	15%	12%
Total percentage	100%	100%
Total numbers	83	33

Source: Hunter & Schmidt, 2004, p. 26.

As the results from Table 3 date back several years and might only partially represent the research area in which we find ourselves with this thesis, we also want to look more specifically at methods used in meta-analyses covering similar topics as the one of this work. Table 4 lists the meta-analyses described in section 2.4 according to their methods used.

Six of the eight listed meta-analyses use the Hunter-Schmidt method. Five of them base their meta-analysis on the first edition of Hunter and Schmidt's book and one (the most recent meta-analysis of the six) uses the second edition of the book. Eagly, Johannesen-Schmidt and Van Engen (2003) do not indicate to follow one specific method, but seem to combine multiple methods of meta-analyses (e.g. Rosenthal and Rubin's (1986) methods; Hedges & Olkin's (1985) methods). In contrast to the other meta-analyses, Eagly, Johannesen-Schmidt and Van Engen (2003) work with *d* values, while the other meta-analyses work with correlations. This is because in their meta-analysis they compare women and men according to differences in the use of transformational, transactional and laissez-faire leadership. Hence, their dichotomous comparison is methodically different to the other meta-analyses (and the meta-analysis presented in this work) and thus makes it less comparable to the other meta-analyses (and the meta-analysis presented in this work). This methodical difference may have also influenced their choice of a

method to use. Aydin, Sarier and Uysal (2013) only state that they follow the method of meta-analysis, but do not report a specific method of meta-analysis they are following.

Table 4 – Methods used in related meta-analyses

Meta-analysis	Method
Fuller, Patterson, Hester & Stringer (1996)	Hunter & Schmidt (1990)
Lowe, Kroeck & Sivasubramaniam (1996)	Hunter & Schmidt (1990)
DeGroot, Kiker & Cross (2000)	Hunter & Schmidt (1990)
Dumdum, Lowe & Avolio (2002)	Hunter & Schmidt (1990)
Eagly, Johannesen-Schmidt & Van Engen (2003)	Mixed
Judge & Piccolo (2004)	Hunter & Schmidt (1990)
Wang, Oh, Courtright & Colbert (2011)	Hunter & Schmidt (2004)
Aydin, Sarier & Uysal (2013)	n/a

Notes: n/a = not available.

So, from Table 4 we can see that meta-analyses with similar research topics primarily use the Hunter-Schmidt method. Dumdum, Lowe and Avolio (2002) also state in their meta-analysis that the Hunter-Schmidt method has become the most widely used meta-analysis method in the research area of organizational behavior. Further, Table 4 demonstrates that also after the year of 2000 – the end of the time frame in Table 3 – the Hunter-Schmidt method appears to be a widely used method in this research area. Thus, we decided to base our meta-analysis on the Hunter-Schmidt method. More specifically, our meta-analytical calculations will be based on the second edition of Hunter and Schmidt’s book – Hunter & Schmidt (2004).

3.1.3. The Hunter-Schmidt method of meta-analysis

According to Hunter and Schmidt (2004) studies are never perfect and always contain some sort of imperfections. Hence, with their method of meta-analysis they provide a tool to account for

such imperfections in studies and give us the possibility to reveal the true correlations (also often called actual correlations or construct-level correlations) between variables.

In their book they list a number of potential study imperfections and call these ‘study artifacts’ to remind that these artifacts are man-made rather than naturally occurring. Eleven study artifacts are outlined in the second edition of their book:

1. Sampling error
2. Error of measurement in the dependent variable
3. Error of measurement in the independent variable
4. Dichotomization of a continuous dependent variable
5. Dichotomization of a continuous independent variable
6. Range variation in the independent variable
7. Range variation in the dependent variable
8. Deviation from perfect construct validity in the independent variable
9. Deviation from perfect construct validity in the dependent variable
10. Reporting or transcriptional error
11. Variance due to extraneous factors that affect the relationship

The authors do not regard this as an exhaustive list, but expect further correctable and/or uncorrectable artifacts to be found in the future. So, even if one corrects for all correctable artifacts there still might be artifacts in the data, be it uncorrectable or not yet discovered artifacts.

In this work, as in many related meta-analyses (e.g. Lowe, Kroeck & Sivasubramaniam, 1996; Dumdum, Lowe & Avolio, 2002; Judge & Piccolo, 2004), we focus on the correction of sampling errors and errors of measurement in both variables. These errors are present in every study and thus Hunter and Schmidt (2004) call for the correction of at least these three sources of

errors in any meta-analysis if the data allow it. According to them the correction of the other artifacts usually proves to be more difficult as the necessary information often is not available due to not yet adequate reporting practices in the individual studies.

In the following the concepts of sampling error and error of measurement are described as outlined in Hunter and Schmidt (2004). Sampling error occurs because individual studies cannot examine the whole population, but only a sample of the examined population. It is defined as the difference between the population correlation and the sample correlation. Integrating many studies in a meta-analysis can reduce the sampling error in the same way as conducting a study with a larger sample size. With a large number of studies included in a meta-analysis the sampling error can virtually be eliminated.

Error of measurement, on the other hand, occurs because variables in studies are not perfectly measured. Reliability measures indicate how reliable a scale is to measure a variable. Usually reliability measures have a value less than one, indicating that the measurement of a variable is not perfect (perfect measurement would be represented by a value equal to one). Therefore, error of measurement leads to the attenuation of correlations in studies. With the help of reliability measures we are able to account for these imperfections in meta-analyses and to correct errors of measurement in both variables.

Hunter and Schmidt (2004) also specify two different ways to calculate a meta-analysis depending on the availability of data. First, in an ideal situation (almost) all the necessary data for correction is available in each study. Then the authors suggest correcting the correlation coefficients individually and continuing with the corrected correlation coefficients to conduct the meta-analysis. On the other hand, if not (almost) all necessary data for correction is available in every study the authors suggest conducting the meta-analysis based on artifact distributions. In this case artifact distributions such as the distribution of observed correlations and the distribution of the reliability of the independent/dependent variable are used for the calculations.

In some cases it can be useful to conduct a more in-depth analysis after an overall meta-analysis has been performed. That is, if less than 75% of the total variance is explained by the sampling error variance, Hunter and Schmidt (2004) suggest conducting a moderator analysis. A moderator creates variance between the correlation coefficients of different studies included in

the meta-analysis. Hence, large amounts of unexplained variance can be a hint for one or more moderator variables in the data of the meta-analysis. But, it is important to note that large amounts of unexplained variances can also stem from artifacts that have not been corrected. So, when a meta-analysis remains with large amounts of unexplained variance, moderators are only one potential source of unexplained variance. Still, it is valuable to test for potential moderator variables in such a case.

To investigate a potential moderator variable the authors suggest splitting the studies into separate groups according to the examined moderator and to conduct a separate meta-analysis for each group. For example, if one examines the relationship between organizational commitment and job satisfaction and assumes that the geographical location might function as a moderator variable, one could split the studies according to their geographical locations and conduct separate meta-analyses. That researcher might put those studies that were performed in Western countries in one group and those studies that were performed in Eastern countries in a second group. She then calculates a meta-analysis for the group of Western studies and a separate meta-analysis for the group of Eastern studies. In general, the variable can be considered a true moderator if the sampling error variance exceeds 75% of the total variance in each meta-analysis.

At this point it is also important to note that Hunter and Schmidt (2004) emphasize to direct the main interpretation of results towards the results of the final level of subgroups (most detailed level of analysis). Interpretations of results from less detailed levels of the analysis might lead us to false conclusions and thus should be treated cautiously as they demonstrate in their book. Therefore, in the case of moderator analysis we should focus our attention to the interpretation of the moderator analysis rather than to the interpretation of overall meta-analytical results.

3.2. Literature search

To find articles to conduct our meta-analysis several databases like ‘Google Scholar’, ‘ABI/INFORM’, ‘Web of Science’ and ‘PsycINFO’ were searched. Moreover, the online library of the University of Vienna (<https://usearch.univie.ac.at>) was used to find further studies. Main keywords used for the search were for example ‘leadership style’, ‘satisfaction’, ‘transformational’ and ‘transactional’. Only articles published in the year 2003 or later were

considered as our work shall continue the meta-analysis by Judge and Piccolo (2004) (see section 2.5). Hence, we set the beginning date of our literature search to 2003. The literature search was conducted between April 2018 and June 2018. So, only studies published in the time frame 2003-2018 are considered in this work.

A total of 75 accessible studies on the relationships between transformational / transactional / laissez-faire leadership and subordinate satisfaction could be identified. Not all of these studies did report information useable for the calculations of our meta-analysis and thus not all of them did contribute to our meta-analytical results presented later in this work. More specifically, 23 of the 75 identified articles neither did report any correlation coefficients nor did they report any reliability measures. The other 52 articles did at least report one correlation coefficient on one of the three relationships or one reliability measure on one of the relevant variables.

Also, to generate representative meta-analytical results we tried to address the issue of the publication bias. The publication bias describes the phenomenon that published studies often do show larger effect sizes than unpublished studies (Hunter & Schmidt, 2004). One reason is that published studies are on average better designed. Another reason is that there is a preference towards publishing statistically significant results over statistically insignificant results. Hence, besides the great majority of articles published in journals that we could identify, we tried to include dissertations in our meta-analysis. In total, out of the 75 identified studies 21 are dissertations and of these 13 remained among the 52 articles that did at least report one correlation coefficient or reliability measure.

At this point it shall be noted that the availability of studies does represent a major restriction when it comes to performing a comprehensive meta-analysis. This is even more the case for students, who in general only have a limited network and financial budget. Not only is it a challenge to obtain access to unpublished studies (e.g. via contact to other researchers), but sometimes it is already difficult to get access to published studies (e.g. studies that are not free to access for students). Nevertheless, a reasonable number of studies could be found and with the inclusion of several dissertations we also should be able to counteract at least to some extent the potential distortional effects that could appear because of the publication bias.

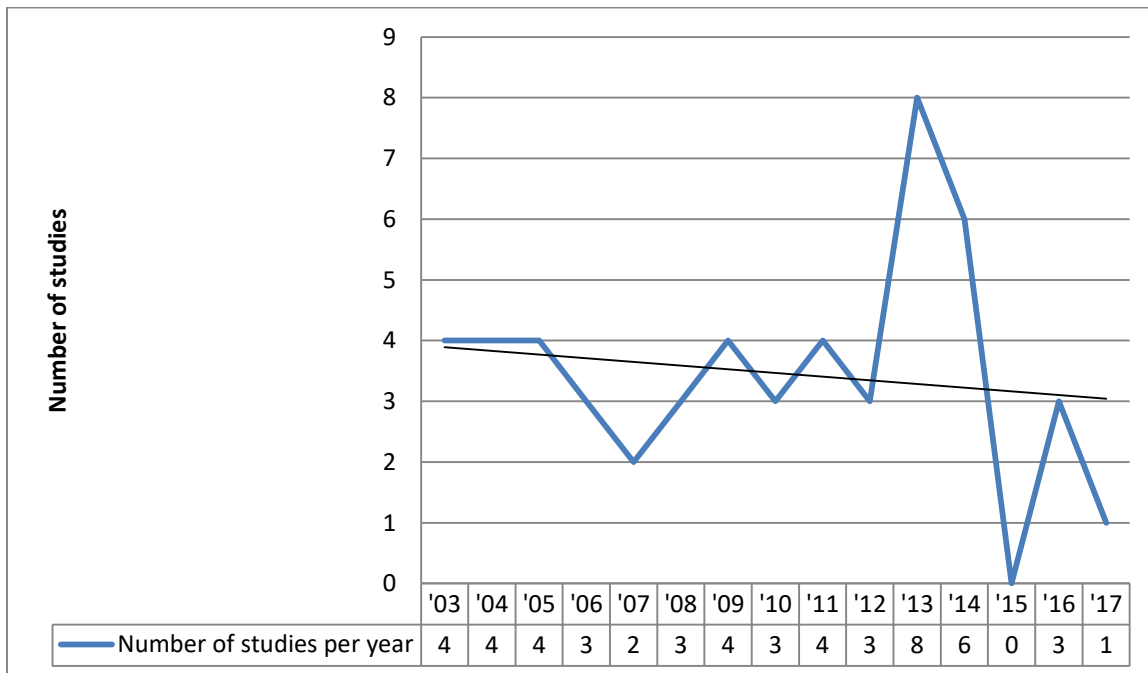
3.3. Coding of studies and study characteristics

From the identified studies information was extracted and coded. Amongst others, the following quantitative and qualitative study characteristics have been recorded.

- Year of publication
- Leadership measurement instrument
- Satisfaction measurement instrument
- Satisfaction type
- Industry (of study participants)
- Geographical location (of study participants)
- Sample sizes
- Correlation coefficients
- Reliability measures

As described above, we only considered studies from 2003 onwards. Hence, the earliest study included in our meta-analysis is from 2003, while the latest study included is from 2017. Even though the literature search was conducted in the second quarter of 2018, no study from the year 2018 could be identified and included in our meta-analysis. Figure 2 shows the temporal distribution of the 52 studies that provide data to conduct our meta-analytical calculations. With the exception of the time frame 2013-2015 the studies appear to be about evenly distributed throughout the 15 years. On average 3 to 4 studies could be identified with respect to each year indicating a representative distribution of studies over the analyzed period of one and a half decades.

Figure 2 – Temporal distribution of the studies included



The qualitative study characteristics – leadership measurement instrument, satisfaction measurement instrument, satisfaction type, industry and geographical location – have been collected to perform a subsequent in-depth analysis: our moderator analysis (see section 4.3).

Among the included studies the dominant leadership measurement instrument is the MLQ followed by the TLI (see subsection 2.2.2 for descriptions of these instruments). Regarding the satisfaction measurement instrument, the dominant instruments are the MLQ, the MSQ and the JDI (see subsection 2.3.2 for descriptions of these instruments). All the instruments mentioned here are instruments that were used by three or more of the included studies. With respect to the satisfaction measurement instrument, here the variety of used instruments throughout the studies is much greater compared to the used leadership measurement instruments. This is because the studies often measure slightly different types of satisfaction variables. Hence, the more general study characteristic of satisfaction type (e.g. job satisfaction, satisfaction with leader, satisfaction with work in general) was also recorded for each study.

Further, the studies included in our analysis vary substantially regarding the examined industries and geographical regions. Industries included are for example banking & finance, hospitality, electronics, IT, manufacturing, health & elderly care, education and sports. Geographical locations examined in the studies include countries from many different continents: America (e.g. United States, Panama), Europe (e.g. Croatia, Denmark, France, Germany, Netherlands, Sweden), Africa (e.g. Kenya, Tanzania), Asia (e.g. China, India, Iran, Pakistan, Taiwan, United Arab Emirates, Vietnam), Oceania (e.g. Australia).

These qualitative study characteristics were later transformed to quantitative data to make them useable in our moderator analysis. For example, studies using the MLQ as the leadership measurement instrument were coded with 1, while studies using other leadership measurement instruments were coded with 2; studies considering a more direct leadership satisfaction type were coded with 1, while studies considering a more general satisfaction type were coded with 2; studies examining typical not-for-profit organizations were coded with 1, while studies examining typical for-profit organizations were coded with 2; studies performed with participants in Western countries were coded with 1, while studies performed with participants in Nonwestern countries were coded with 2. For more details about our moderator analysis the reader is referred to section 4.3.

The quantitative study characteristics – sample sizes, correlation coefficients and reliability measures – represent the main variables necessary for our meta-analytical calculations according to the method of Hunter and Schmidt (2004). In Table 5 we summarize the amounts of data we could retrieve through our literature search. In total, the 52 articles that provide data for our calculations yield 49 correlation coefficients for the relationship between transformational leadership and subordinate satisfaction, 28 correlation coefficients for the relationship between transactional leadership and subordinate satisfaction and 18 correlation coefficients for the relationship between laissez-faire leadership and subordinate satisfaction. Some of these correlations had to be excluded from our meta-analysis for different reasons. For example, some did represent correlations from group level analyses or correlations from secondary data analyses with sample sizes thousandfold larger than the average sample size of the other studies. Hence, the numbers of correlation coefficients reported in the results part of this thesis are smaller than the numbers of correlation coefficients reported in Table 5.

Table 5 – Qualitative Study Characteristics

	Transformational Leadership	Transactional Leadership	Laissez-faire Leadership	Subordinate Satisfaction
Number of reported Sample Sizes	49 (24%)	28 (36%)	18 (50%)	-
Number of reported Correlation Coefficients	49 (24%)	28 (36%)	18 (50%)	-
Number of reported Reliability Measures	38 (18%)	18 (28%)	9 (44%)	51 (18%)

Notes: Numbers in parentheses refer to the portions of data stemming from dissertations.

Each article that reported one or more correlation coefficients about the examined relationships did also report the corresponding sample sizes, but not all articles did report all or any reliability measures. Therefore, we apply different approaches to calculate our meta-analysis in the following chapter. In Table 5 we can also see that a substantial amount of our data is stemming from dissertations, helping us to counteract potential negative effects arising from the publication bias (see section 3.2 for details on the publication bias).

4. Results

The meta-analytical results of this thesis will be presented in three steps. First, the results of a rather strict approach are described in section 4.1. Under this approach only studies that provide all necessary data to individually correct correlations are included in the analysis. Second, the results of a less strict approach are described in section 4.2. This less strict approach also includes studies that miss certain data to individually correct correlations. Third, proceeding with the results from the less strict approach, a moderator analysis is conducted in section 4.3 to find potential variables that moderate the relationships between leadership styles and subordinate satisfaction.

4.1. Individually corrected (Narrow Approach)

In this section a more conservative approach to perform a meta-analysis is followed. Described as ideal by Hunter and Schmidt (2004), in an optimal situation the researcher finds all the needed information to individually correct each correlation in each respective study and then is able to conduct a meta-analysis on these corrected values. So, in a first step to provide an analysis as exact as possible only studies that provide all the data needed to be able to follow the described approach were included in the analysis.

The results are presented in Table 6. Out of the total number of 75 studies that were identified to cover at least one of the topics of transformational, transactional or laissez-faire leadership in relation to subordinate satisfaction, 35 correlations for transformational leadership, 17 correlations for transactional leadership and 9 correlations for laissez-faire leadership could be extracted. For each of these correlations the respective study also included the sample size and reliability measures. The latter were needed for individual correction.

Table 6 – Results for Individually corrected (Narrow Approach)

	Transformational Leadership	Transactional Leadership	Laissez-faire Leadership
Total Sample Size N	10,495	3,797	2,781
Number of Correlation Coefficients k	35	17	9
Range of Correlation Coefficients	0.14 to 0.89	0.22 to 0.70	-0.72 to 0.17
Mean Uncorrected Correlation $\bar{r}$	0.47	0.36	-0.39
Estimated True Score Correlation $\hat{\rho}$	0.52	0.43	-0.47
Variance due to Sampling Error in %	5%	20%	4%
80% Credibility Interval	0.24 to 0.80	0.25 to 0.61	-0.82 to -0.11
95% Confidence Interval	0.45 to 0.60	0.35 to 0.51	-0.65 to -0.28

As a first indicator for the direction of the relationship between the respective leadership style and subordinate satisfaction, one may investigate the range of correlation coefficients. For transformational (from $r = 0.14$ to $r = 0.89$) and transactional leadership (from $r = 0.22$ to $r = 0.70$) this range lies completely within the range of positive numbers, meaning that both the minimum correlation and the maximum correlation are positive and above zero. This serves as a predictor for the relationship between transformational leadership and subordinate satisfaction to be positive and nonzero and for the relationship between transactional leadership and subordinate satisfaction to be positive and nonzero. In contrast, the range of correlations for laissez-faire leadership reaches from $r = -0.72$ to $r = 0.17$ and thus includes zero, making it harder to derive any predictions up front about the direction of the relationship between laissez-faire leadership and subordinate satisfaction. Looking in more detail at the individual

correlations included to analyze this relationship reveals that only one of the nine correlation coefficients is positive ($r = 0.17$). All other (eight) correlations are negative ranging from $r = -0.72$ to $r = -0.12$. So, in this case only one single correlation (respectively one single study) leads to the fact that the range of correlation coefficients is spanning over negative and positive values including the decisive point of zero. Without this one positive correlation the range of correlation coefficients would only comprise negative values and would have led us to an expected negative relationship between laissez-faire leadership and subordinate satisfaction. But, with this positive correlation the range of correlation coefficients widens crucially, because then it includes zero and thus creates uncertainty about the direction of the relationship. Of course, as we know that eight correlations are negative and only one correlation is positive we might expect an overall negative relationship. But, only looking at the range of correlation coefficients itself without knowing the distribution of correlations behind it would leave us with greater uncertainty and inability to make any predictions about the potential direction of the relationship.

Another indicator for the potential directions of the relationships is the mean uncorrected correlation ($\bar{r}$). It is computed as the sample-size weighted mean correlation of the included correlations without the consideration of any artifacts (Hunter & Schmidt, 2004). Since all the correlation coefficients for transformational and transactional leadership are positive, the mean uncorrected correlation for transformational leadership ($\bar{r} = 0.47$) and for transactional leadership ($\bar{r} = 0.36$) must be positive as well. The mean uncorrected correlation for laissez-faire leadership ($\bar{r} = -0.39$) is negative, providing further indication for the relationship between laissez-faire leadership and subordinate satisfaction to potentially being negative.

Summing up this preliminary analysis of rather descriptive statistical values, one would expect the overall relationship between transformational leadership and subordinate satisfaction to be positive and nonzero, since its mean uncorrected correlation is positive and its range of correlation coefficients includes only positive values. Same is true for the relationship between transactional leadership and subordinate satisfaction. The expected overall relationship between laissez-faire leadership and subordinate satisfaction, on the other hand, seems to be negative as its mean uncorrected correlation is negative, but also seems to be less certain, since its range of correlation coefficients includes positive and negative values.

Now we want to look at more prominent outcomes of the meta-analysis and see if our predictions derived from the more descriptive parts of the outcomes hold true. First, we consider the estimated true score correlation, which is the weighted mean correlation of the corrected correlations or, put differently, the weighted mean correlation of correlations where artifacts have been accounted for (Hunter & Schmidt, 2004). The estimated true score correlation can be regarded as the aggregated result of the considered studies where imperfections have been identified and corrected and therefore represents one of our main variables of interest. Its value is positive for transformational ($\hat{\rho} = 0.52$) and transactional leadership ($\hat{\rho} = 0.43$) and negative for laissez-faire leadership ($\hat{\rho} = -0.47$). Compared to the mean uncorrected correlations the estimated true score correlations (also called mean corrected correlations) appear to be stronger in magnitude. So, the positive mean uncorrected correlations turn into even higher (more positive) mean corrected correlations, while the negative mean uncorrected correlation turns into an even lower (more negative) mean corrected correlation. For instance, the mean uncorrected correlation for transformational leadership ($\bar{r} = 0.47$) is less positive than its mean corrected correlation ($\hat{\rho} = 0.52$), while the mean uncorrected correlation for laissez-faire leadership ($\bar{r} = -0.39$) is less negative than its mean corrected correlation ($\hat{\rho} = -0.47$).

With regards to the predictions outlined above, which we derived from the descriptive parts of the statistics in Table 6, we find that these predictions hold true as according to the estimated true score correlations the relationships for transformational and transactional leadership with respect to satisfaction are positive and the relationship between laissez-faire leadership and satisfaction is negative. This is also in line with our proposed hypotheses. So, according to the results presented in this section the first part of each hypothesis – the direction of the relationship – is confirmed.

- H1: Transformational leadership will have a **positive**, nonzero relationship with subordinate satisfaction.
- H2: Transactional leadership will have a **positive**, nonzero relationship with subordinate satisfaction.
- H3: Laissez-faire leadership will have a **negative**, nonzero relationship with subordinate satisfaction.

To test the second part of each hypothesis – the nonzero characteristic of the relationship – confidence and credibility intervals have been provided. We apply the same interval widths as applied by Judge and Piccolo (2004) – 80% for the credibility intervals and 95% for the confidence intervals. Even though they vary the width for their confidence intervals between 90% and 95%, we decided to always apply a 95% confidence interval width. The interpretation of a 95% confidence interval computed around a positive correlation estimate that excludes zero is that if the estimation procedures would be repeated many times 97.5% of the cases the correlation estimate would be positive (2.5% lie above the upper bound of the interval) (Judge & Piccolo, 2004). The interpretation of an 80% credibility interval computed around a positive correlation estimate that excludes zero is that 90% of individual correlations in the meta-analysis are positive (10% lie above the upper bound of the interval) (Judge & Piccolo, 2004). In short, confidence intervals refer to the variability of the mean correlation, while credibility intervals refer to the variability of individual correlations across studies (Judge & Piccolo, 2004). Usually, in meta-analysis credibility intervals are regarded as more important than confidence intervals, *inter alia*, because credibility intervals do not depend on sampling error (Hunter & Schmidt, 2004).

Confidence and credibility intervals can be found at the bottom of Table 6. The 80% credibility intervals for transformational ($CV_{80\%} = 0.24 \text{ to } 0.80$) and transactional leadership ($CV_{80\%} = 0.25 \text{ to } 0.61$) lie fully within the range of positive numbers and exclude zero. In contrast, the 80% credibility interval for laissez-faire leadership ($CV_{80\%} = -0.82 \text{ to } -0.11$) lies fully within the range of negative numbers, but also excludes zero. The 95% confidence intervals look similar, only they appear to be somewhat narrower. Hence, the 95% confidence intervals for transformational ($CI_{95\%} = 0.45 \text{ to } 0.60$) and transactional leadership ($CI_{95\%} = 0.35 \text{ to } 0.51$) lie also fully within the range of positive numbers and exclude zero, while the 95% confidence interval for laissez-faire leadership ($CI_{95\%} = -0.65 \text{ to } -0.28$) lies fully within the range of negative numbers and excludes zero.

These results lead us to the confirmation of the second part of each hypothesis. Since confidence and credibility intervals for transformational and transactional leadership are positive and exclude zero, the nonzero characteristic of H1 and H2 is confirmed. Similarly, the confidence

and credibility intervals for laissez-faire leadership are negative and exclude zero, thus confirming the nonzero characteristic of H3.

- H1: Transformational leadership will have a **positive**, **nonzero** relationship with subordinate satisfaction.
- H2: Transactional leadership will have a **positive**, **nonzero** relationship with subordinate satisfaction.
- H3: Laissez-faire leadership will have a **negative**, **nonzero** relationship with subordinate satisfaction.

Referring back once more to the predictions derived from the descriptive statistics, we would have correctly predicted the positive, nonzero relationships for transformational and transactional leadership, given their mean uncorrected correlations and ranges of correlation coefficients. Also, we would have correctly predicted the negative relationship for laissez-faire leadership, but were not certain about the nonzero characteristic in this case. Now, with meta-analytical methods, we were able to provide measures to test the proposed hypotheses. Using estimates for the true score correlations as well as confidence and credibility intervals brought us to the conclusion that each of the three hypotheses can be confirmed according to the results of the approach applied in this section.

However, we did not address one important variable from Table 6 so far – the variance due to sampling error. The variance due to sampling error gives information about how much of the total variance in correlations is the result of sampling errors (Hunter & Schmidt, 2004). If less than 75% of the total variance is explained by sampling errors, then there is a chance that moderator variables could be a reason for large amounts of unexplained variance, and thus, Hunter and Schmidt (2004) recommend to conduct a moderator analysis. The topic of moderator analysis is referred to in more detail in subsection 3.1.3. In the results presented in Table 6 we find that only 5% of the total variance in correlations for transformational leadership, 20% for transactional leadership and 4% for laissez-faire leadership are explained by sampling errors. So, there must be other factors that account for the large amounts of unexplained variance, possibly moderator variables.

This is important to note, because the low percentage values of variances due to sampling error suggest conducting a moderator analysis and therefore the analysis in this section will not be our most detailed level of analysis. The most detailed level of analysis will then be represented by the moderator analysis and results at less detailed levels of the analysis should be treated cautiously (Hunter & Schmidt, 2004). But, before we move on to our most detailed level of analysis, the moderator analysis, we first consider another approach to individually correct correlations in meta-analyses.

4.2. Individually corrected (Broad Approach)

In this section a less strict approach in regards to study inclusion is applied to calculate individually corrected meta-analyses. As the researcher might not be able to extract all the necessary data for calculations from each and every study he wants to include in the meta-analysis, for some data he might consider to substitute the missing data. Following the approach of Judge and Piccolo (2004), we do so by calculating mean values for reliability measures and use those means to individually correct correlation coefficients for error of measurement when studies do not report reliability measures. In other words, if a study contained reliability measures, the reported reliability measures were used; if a study did not contain reliability measures, the mean values calculated with data from the other studies were used. While with the approach applied in the previous section (what we called the ‘Narrow Approach’) studies that did not report reliability measures were excluded from the meta-analysis, with this approach more studies (respectively correlation coefficients) can be included in the meta-analysis. Therefore, we call this approach the ‘Broad Approach’.

Table 7 summarizes information about the reliability measures obtained from the studies. Cronbach’s alpha was the predominant measure the studies used to report scale reliabilities. The means for the reliability measures are as follows: 0.92 for transformational leadership, 0.79 for transactional leadership, 0.82 for laissez-faire leadership and 0.85 for subordinate satisfaction.

Table 7 – Reliability measures for Broad Approach

	Transformational Leadership	Transactional Leadership	Laissez-faire Leadership	Subordinate Satisfaction
Number of Studies that reported Reliability Measures	29	16	8	42
Number of Reliability Measures	38	18	9	51
Range of Reliability Measures	0.80 to 0.96	0.67 to 0.95	0.64 to 0.94	0.60 to 0.98
Mean Reliability Measure	0.92	0.79	0.82	0.85

An interesting point that should be referred to is the range of reliability measures for subordinate satisfaction. One might argue that of course this range has to be the broadest, since it comprises the largest number of reliability measures (51). But, when we compare the data of transformational leadership with those of laissez-faire leadership, we see that this has not necessarily to be the case. There are 38 measures of reliability for transformational leadership with a range from 0.80 to 0.96, while laissez-faire leadership with a number of only 9 reliability measures results in a much broader range reaching from 0.64 to 0.94. So, the number of reliability measures might not be a sufficient explanation for the width of the range of reliability measures for subordinate satisfaction in our case. One possible explanation could be the fact that subordinate satisfaction comprises a number of different satisfaction measures, as discussed in sections 2.3 and 3.3. Consequently, there is a greater variety of instruments used to measure the satisfaction part of the relationships and thus reliability measures differ more strongly. This is important to note, as the different satisfaction measures obviously have influence on our data, which should be considered in further analyses. We will refer back to this point in the next section – the moderator analysis.

An alternative way to use mean reliability measures would be to calculate separate mean reliability measures for different instruments and to use these means whenever a study does not report reliability measures, but uses a certain instrument. This could lead to more precise results, especially when there are variables where the range of reliability measures appears to be broad.

The results of the approach applied in this section are presented in Table 8. Similarly to the results of the previous section (Narrow Approach), we make the following observations. The ranges of correlation coefficients for transformational (from $r = 0.14$ to $r = 0.91$) and transactional leadership (from $r = 0.07$ to $r = 0.76$) are still within positive numbers, while the range of correlation coefficients for laissez-faire leadership (from $r = -0.72$ to $r = 0.17$) still stretches over positive and negative numbers. The mean uncorrected correlations are positive for transformational ($\bar{r} = 0.49$) and transactional leadership ($\bar{r} = 0.34$) and negative for laissez-faire leadership ($\bar{r} = -0.33$). So are the estimated true score correlations (mean corrected correlations): $\hat{\rho} = 0.54$ for transformational, $\hat{\rho} = 0.40$ for transactional and $\hat{\rho} = -0.40$ for laissez-faire leadership. Confidence and credibility intervals are within the positive numbers and exclude zero for transformational ($CV_{80\%} = 0.24$ to 0.85) ($CI_{95\%} = 0.47$ to 0.61) and transactional leadership ($CV_{80\%} = 0.18$ to 0.62) ($CI_{95\%} = 0.33$ to 0.47) and are within the negative numbers and exclude zero for laissez-faire leadership ($CV_{80\%} = -0.78$ to -0.01) ($CI_{95\%} = -0.54$ to -0.26). Thus, overall the results derived through the application of the Broad Approach still confirm the proposed hypotheses. For an in-depth elaboration on how individual results lead to the confirmation of the hypotheses the reader is referred to the previous section (Narrow Approach).

Table 8 – Results for Individually corrected (Broad Approach)

	Transformational Leadership	Transactional Leadership	Laissez-faire Leadership
Total Sample Size N	12,355	5,069	4,189
Number of Correlation Coefficients k	46	26	18
Range of Correlation Coefficients	0.14 to 0.91	0.07 to 0.76	-0.72 to 0.17
Mean Uncorrected Correlation $\bar{r}$	0.49	0.34	-0.33
Estimated True Score Correlation $\hat{\rho}$	0.54	0.40	-0.40
Variance due to Sampling Error in %	5%	16%	5%
80% Credibility Interval	0.24 to 0.85	0.18 to 0.62	-0.78 to -0.01
95% Confidence Interval	0.47 to 0.61	0.33 to 0.47	-0.54 to -0.26

To compare more thoroughly the results of the Narrow Approach and the Broad Approach the values of Table 6 and Table 8 are contrasted in Table 9.

Table 9 – Comparison of Narrow Approach and Broad Approach

Approach	Transformational Leadership		Transactional Leadership		Laissez-faire Leadership	
	Narrow Approach	Broad Approach	Narrow Approach	Broad Approach	Narrow Approach	Broad Approach
Total Sample Size N	10,495	12,355	3,797	5,069	2,781	4,189
Number of Correlation Coefficients k	35	46	17	26	9	18
Range of Correlation Coefficients	0.14 to 0.89	0.14 to 0.91	0.22 to 0.70	0.07 to 0.76	-0.72 to 0.17	-0.72 to 0.17
Mean Uncorrected Correlation $\bar{r}$	0.47	0.49	0.36	0.34	-0.39	-0.33
Estimated True Score Correlation $\hat{\rho}$	0.52	0.54	0.43	0.40	-0.47	-0.40
Variance due to Sampling Error in %	5%	5%	20%	16%	4%	5%
80% Credibility Interval	0.24 to 0.80	0.24 to 0.85	0.25 to 0.61	0.18 to 0.62	-0.82 to -0.11	-0.78 to -0.01
95% Confidence Interval	0.45 to 0.60	0.47 to 0.61	0.35 to 0.51	0.33 to 0.47	-0.65 to -0.28	-0.54 to -0.26

By following the approach of Judge and Piccolo (2004), we could increase the number of studies to be included and thus could increase the number of correlation coefficients used in the meta-analysis. In the end 46 correlations for transformational, 26 correlations for transactional and 18 correlations for laissez-faire leadership could be included. This corresponds to a more than 30% increase of used correlations for transformational leadership and an over 50% increase of used correlations for transactional leadership. For laissez-faire leadership the number of correlation coefficients even doubled by applying the Broad Approach.

The ranges of correlation coefficients widened, except for laissez-faire leadership, which still ranges from $r = -0.72$ to $r = 0.17$. This might suggest that there is little change with respect to

the results of laissez-faire leadership. However, a more detailed look at the individual correlations reveals an interesting point. Now a second positive correlation coefficient for the relationship between laissez-faire leadership and subordinate satisfaction can be found. This enhances the uncertainty of the negativity of this relationship. In the section of the Narrow Approach it appeared as if the positive correlation of $r = 0.17$ is only an outlier that could possibly be neglected. Now, with the application of the Broad Approach, a second positive correlation was found and included in the calculations, which increases our uncertainty about the direction of this relationship to some extent. One should also notice the changes in the ranges of correlation coefficients for transformational and transactional leadership. For transformational leadership the range only widens towards the upper bound, while for transactional leadership the range widens towards both the upper and the lower bound of the interval, but with a stronger effect towards the lower bound. Of course, inferences based on the observed changes in the ranges of correlation coefficients should only be made with caution. This is because just one single correlation coefficient can lead to the distortion of a range of correlation coefficients. Nevertheless, it is interesting to notice these changes as we next compare the mean uncorrected correlations and mean corrected correlations of the two approaches.

The mean uncorrected correlation increased for transformational leadership (from $\bar{r} = 0.47$ to $\bar{r} = 0.49$), decreased for transactional leadership (from $\bar{r} = 0.36$ to $\bar{r} = 0.34$) and increased for laissez-faire leadership (from $\bar{r} = -0.39$ to $\bar{r} = -0.33$). With respect to the effect size of the mean uncorrected correlations this means that the inclusion of further studies led to an increased effect size for transformational leadership and a decreased effect size for transactional and laissez-faire leadership. The changes are generally small, ranging from $\bar{r}_\Delta = 0.02$ to $\bar{r}_\Delta = 0.06$. All of the above is also true for the estimated true score correlations (mean corrected correlations) with the exception that the changes for transactional ($\hat{\rho}_\Delta = 0.03$) and laissez-faire leadership ($\hat{\rho}_\Delta = 0.07$) are slightly larger. The changes for the estimated true score correlations are as follows: from $\hat{\rho} = 0.52$ to $\hat{\rho} = 0.54$ for transformational, from $\hat{\rho} = 0.43$ to $\hat{\rho} = 0.40$ for transactional and from $\hat{\rho} = -0.47$ to $\hat{\rho} = -0.40$ for laissez-faire leadership.

The reader should be made aware of that interestingly the changes of the mean uncorrected correlations and the mean corrected correlations coincide with the changes of the ranges of correlation coefficients pointed out above. For transformational leadership the range of

correlation coefficients increased towards the upper bound of the interval, thus the mean (uncorrected/corrected) correlation increased. For transactional leadership the range of correlation coefficients increased towards both bounds, but more towards the lower bound, thus the mean correlation decreased. For laissez-faire leadership the range of correlation coefficients did not change, but another positive correlation coefficient was found for this relationship, thus the effect size decreased. Again, these changes do not have to coincide at all and inferences made upon the ranges of correlation coefficients should be treated cautiously. It could well have been the case that even though its range of correlation coefficients increased towards the upper bound of the interval the mean correlation for transformational leadership had decreased. Nevertheless, if we were to assume uniformly distributed values within the intervals, we would expect these changes to coincide.

The values for the variances due to sampling error hardly changed when we consider the 75% threshold suggested by Hunter and Schmidt (2004) to represent a satisfactory value. The variance due to sampling error for transformational leadership remained at 5%, decreased from 20% to 16% for transactional leadership and increased from 4% to 5% for laissez-faire leadership.

Also, the confidence and credibility intervals hardly changed. In general, the confidence intervals became narrower, while the credibility intervals widened. This is because the standard error component to compute the confidence intervals generally became smaller, while the standard deviations of the true correlations, which are used to calculate credibility intervals, became larger. Further, one can identify the following movements. For transformational leadership the intervals moved away from zero (towards positive one). This is in line with the increase in the mean (uncorrected/corrected) correlation for transformational leadership. For transactional and laissez-faire leadership the intervals moved towards zero (away from positive one respectively negative one). This is in line with the decreased effect size of the mean correlations for these two leadership styles. Perhaps the most important change with respect to the confidence and credibility intervals that one should notice is that the credibility interval for laissez-faire leadership now almost includes zero ($CV_{80\%} = -0.78$ to -0.01). So, our hypothesis with respect to laissez-faire leadership got almost rejected and holds only marginally with the application of the Broad Approach. For the detailed changes of the intervals the reader is referred to Table 9.

After comparing the results of the two approaches, it is next interesting to compare our results to those of other meta-analyses. In section 2.4 we identified three other meta-analyses that report values on the level of aggregated leadership style scales: Dumdum, Lowe and Avolio (2002); Judge and Piccolo (2004); Aydin, Sarier and Uysal (2013). Their results are contrasted with ours in Table 10.

For the Judge and Piccolo (2004) study two values per variable are provided in Table 10, because the authors report in their work separate values for a ‘Follower job satisfaction’ variable and a ‘Follower satisfaction with leader’ variable. The values in parentheses refer to the latter variable. In the Dumdum, Lowe and Avolio (2002) study the satisfaction measure was averaged whenever necessary (i.e. one satisfaction measure was calculated from the subscales ‘satisfaction with leader’ and ‘job satisfaction’) and the Aydin, Sarier and Uysal (2013) study reports the relationships based on a job satisfaction measure.

As described in section 2.4, Dumdum, Lowe and Avolio (2002) present findings for subscales of leadership styles (e.g. attributed charisma, idealized influence, etc.) and aggregated leadership style scales (e.g. transformational and transactional leadership). They also report confidence and credibility intervals in detail. Judge and Piccolo (2004) provide results for the overall scales of transformational and laissez-faire leadership and for the subscales of transactional leadership (i.e. contingent reward, management by exception active, management by exception passive). Therefore, we lack on results about an overall scale of transactional leadership in that study. Further, Judge and Piccolo (2004) provide information about confidence and credibility intervals, but only insofar as they mark for which estimates the intervals exclude zero. Aydin, Sarier and Uysal (2013) only report results on the overall scales of transformational, transactional and laissez-faire leadership. They are less detailed in their report and thus we miss some valuable information, especially information about confidence and credibility intervals.

Table 10 – Comparison to other meta-analyses

		Transformational Leadership	Transactional Leadership	Laissez-faire Leadership
Dumdum, Lowe & Avolio (2002)	N	4,034	1,347	7,199
	k	19	5	19
	$\hat{\rho}$	0.40	0.21	-0.53
	95% CV	-0.15 to 0.95	0.02 to 0.39	-1.00 to 0.07
	95% CI	0.26 to 0.53	0.11 to 0.31	-0.40 to -0.66
Judge & Piccolo (2004) ¹⁾	N	5,279 (4,349)	-	392 (838)
	k	18 (23)	-	2 (5)
	$\hat{\rho}$	0.58 (0.71)	-	-0.28 (-0.58)
	80% CV	Excluded zero (Excluded zero)	-	Excluded zero (Excluded zero)
	95% CI	Excluded zero (Excluded zero)	-	Excluded zero ²⁾ (Excluded zero) ²⁾
Aydin, Sarier & Uysal (2013) ³⁾	$\hat{\rho}$	0.81	0.56	-0.15
Broad Approach (Narrow Approach) ⁴⁾	N	12,355 (10,495)	5,069 (3,797)	4,189 (2,781)
	k	46 (35)	26 (17)	18 (9)
	$\hat{\rho}$	0.54 (0.52)	0.40 (0.43)	-0.40 (-0.47)
	80% CV	0.24 to 0.85 (0.24 to 0.80)	0.18 to 0.62 (0.25 to 0.61)	-0.78 to -0.01 (-0.82 to -0.11)
	95% CI	0.47 to 0.61 (0.45 to 0.60)	0.33 to 0.47 (0.35 to 0.51)	-0.54 to -0.26 (-0.65 to -0.28)

Notes: N = Total Sample Size; k = Number of Correlation Coefficients; $\hat{\rho}$ = Estimated True Score Correlation; CV = Credibility Interval; CI = Confidence Interval. ¹⁾ Numbers outside parentheses refer to the results for Follower job satisfaction; Numbers in parentheses refer to the results for Follower satisfaction with leader. ²⁾ Confidence Intervals for Laissez-faire Leadership calculated at 90%. ³⁾ No data for Total Sample Sizes (N), Number of Correlation Coefficients (k), Confidence and Credibility Intervals provided in the study. ⁴⁾ Numbers in parentheses refer to the results of the Narrow Approach.

For transformational leadership Dumdum, Lowe and Avolio (2002) report an estimated true score correlation of $\hat{\rho} = 0.40$, Judge and Piccolo (2004) report values of $\hat{\rho} = 0.58$ (for follower job satisfaction) respectively $\hat{\rho} = 0.71$ (for follower satisfaction with leader), and Aydin, Sarier and Uysal (2013) report the highest estimate for this leadership style with $\hat{\rho} = 0.81$. The unweighted average of those four correlations reveals a value of $\hat{\rho} = 0.63$. With values of $\hat{\rho} = 0.54$ (Broad Approach) respectively $\hat{\rho} = 0.52$ (Narrow Approach) our results lie within the results of the other meta-analyses and are close to the unweighted average of those results. With respect to the confidence and credibility intervals, in the Judge and Piccolo (2004) study the intervals exclude zero, while in the Dumdum, Lowe and Avolio (2002) study the confidence interval excludes zero, but the credibility interval includes zero. However, the careful reader notices that Dumdum, Lowe and Avolio (2002) calculated 95% credibility intervals instead of 80% credibility intervals as we did. Adjusting the width of their interval to 80% assuming a standard normal distribution reveals that the 80% credibility interval excludes zero ($CV_{80\%} = 0.04$ to 0.76). In short, the 95% confidence intervals and 80% credibility intervals of the other meta-analyses also exclude zero. Hence, our results with respect to transformational leadership do not surprise and are similar to those of previous meta-analytical studies.

For transactional leadership Dumdum, Lowe and Avolio (2002) report an estimated true score correlation of $\hat{\rho} = 0.21$, Judge and Piccolo (2004) do not provide results for the overall scale of transactional leadership as stated above, and Aydin, Sarier and Uysal (2013) report a value of $\hat{\rho} = 0.56$. The unweighted average of the two values is $\hat{\rho} = 0.39$. Our results $\hat{\rho} = 0.40$ (Broad Approach) and $\hat{\rho} = 0.43$ (Narrow Approach) again lie within the results of the other meta-analyses and are this time even closer to the unweighted average than in the case of transformational leadership. Further, this time we would not even need to adjust the intervals provided by Dumdum, Lowe and Avolio (2002) to see that both of them exclude zero. Nevertheless, an estimate for their 80% credibility interval is provided ($CV_{80\%} = 0.09$ to 0.33). So, also our results for transactional leadership are similar to the results of the other meta-analyses.

For laissez-faire leadership Dumdum, Lowe and Avolio (2002) report an estimated true score correlation of $\hat{\rho} = -0.53$, Judge and Piccolo (2004) report values of $\hat{\rho} = -0.28$ (for follower job satisfaction) and $\hat{\rho} = -0.58$ (for follower satisfaction with leader), and Aydin, Sarier and

Uysal (2013) report a value of $\hat{\rho} = -0.15$. The unweighted average of those four estimates is $\hat{\rho} = -0.39$. Once more our results, $\hat{\rho} = -0.40$ (Broad Approach) and $\hat{\rho} = -0.47$ (Narrow Approach), lie within the results of the other meta-analyses and are close to the calculated unweighted average of previous meta-analytical results. To show that the confidence and credibility intervals of the other meta-analyses exclude zero, we again have to adjust the 95% credibility interval reported by Dum Dum, Lowe and Avolio (2002) ($CV_{80\%} = -0.92$ to -0.14). All other intervals for laissez-faire leadership reported by the other meta-analyses exclude zero as can be retrieved from Table 10. Hence, also our results for laissez-faire leadership are consistent with the findings of previous meta-analytical results.

Overall, this work did not generate any surprising results so far. All the results provided up to now coincide with previously performed research. Nevertheless, the results in this and the previous section will not represent our most detailed level of analysis and thus the reader is reminded to treat these results with caution as mentioned in the previous section. Our most detailed level of analysis is presented in the following section – the moderator analysis.

4.3. Moderator analysis

Since the portions of sampling error variances in total variances are generally small (between 4% and 20%) as outlined in Table 6, Table 8 and Table 9, it is recommended to test for potential moderator variables, which represent possible sources of unexplained variance (Hunter & Schmidt, 2004). Due to the similarity of the results of the Narrow Approach and the Broad Approach and the improved comprehensiveness of the Broad Approach the moderator analysis is conducted on the basis of the results of the Broad Approach. In the following we will test four potential moderators. The first one refers to the measurement of the leadership style variable. The second addresses the other end of the leadership-satisfaction-relationship – the measurement of the satisfaction variable. The other two moderators are less technical. They are less concerned with the measurement of variables. Instead, they are more related to the overall contexts of the studies included in our meta-analysis. The third moderator test refers to the types of organizations examined in the studies and the fourth addresses the geographical locations in which the studies have been conducted.

4.3.1. Moderator 1: Leadership style measurement

In the research area we are finding ourselves with this work different variable measures are often used to identify potential moderators in meta-analyses (e.g. Fuller, Patterson, Hester & Stringer, 1996; DeGroot, Kiker & Cross, 2000, Dumdum, Lowe & Avolio, 2002). While such studies frequently refer to the criterion measurement, as it is often called in such meta-analyses, it is deemed interesting to examine also the measurement of the other part of the relationship – the predictor measurement or, more specifically, the measurement of the leadership styles in our case. We will examine different measures of satisfaction in our second moderator test (see subsection 4.3.2).

So, in a first step to identify potential moderator variables the studies included in our meta-analysis will be grouped according to the instrument used to measure leadership styles. The predominant instrument to measure the leadership styles investigated in this work is a version of the MLQ. Another often used instrument is the TLI, but compared to the MLQ the TLI was much less used in the identified studies. The MLQ and TLI are described in more detail in subsection 2.2.2. Some authors used less known instruments or even created their own ones (e.g. Ali, Jan, Ali & Tariq, 2014) to measure leadership styles. To investigate potential effects of the varying use of instruments throughout the included studies two groups were created to conduct separate meta-analyses. The first group contains the studies that measured the respective leadership style with a version of the MLQ. The other group contains all studies that measured the respective leadership style with any other instrument than the MLQ. This procedure was conducted for each of the three leadership styles. We would expect more of the variance to be explained by the sampling error for both groups, if the leadership measurement instrument functions as a moderator variable. However, we also expect for the meta-analysis of the MLQ group to show a higher value of explained variance than for the group not using the MLQ. The assumption here is that a variety of different leadership measurement instruments in a group of studies still generates more variance in the results than a group of studies that uses only one single leadership measurement instrument (the MLQ).

For laissez-faire leadership 17 out of the 18 studies used the MLQ as leadership measurement instrument. Thus, only one study used another instrument, which does not allow us to conduct two separate meta-analyses for laissez-faire leadership with respect to the potential moderator

examined in this section. For transformational leadership 30 studies used the MLQ and 16 studies used another measure. For transactional leadership 19 studies used the MLQ and 7 studies did use another measure. So, for these two leadership styles we could calculate separate meta-analyses. The detailed results are presented in Table 11.

Table 11 – Results for Moderator 1: Leadership style measurement

Moderator	Transformational Leadership		Transactional Leadership		Laissez-faire Leadership	
	MLQ	Not MLQ	MLQ	Not MLQ	MLQ	Not MLQ
Total Sample Size N	7,527	4,828	3,939	1,130	3,754	435
Number of Correlation Coefficients k	30	16	19	7	17	1 ¹⁾
Range of Correlation Coefficients	0.14 to 0.91	0.23 to 0.89	0.07 to 0.76	0.22 to 0.66	-0.72 to 0.17	-0.50 to -0.50
Mean Uncorrected Correlation $\bar{r}$	0.49	0.48	0.35	0.29	-0.31	-0.50
Estimated True Score Correlation $\hat{\rho}$	0.54	0.54	0.42	0.34	n/a	n/a
Variance due to Sampling Error in %	5%	4%	13%	42%	n/a	n/a
80% Credibility Interval	0.25 to 0.84	0.22 to 0.86	0.17 to 0.67	0.21 to 0.46	n/a	n/a
95% Confidence Interval	0.46 to 0.63	0.41 to 0.66	0.33 to 0.51	0.24 to 0.43	n/a	n/a

Notes: n/a = not available. ¹⁾ The insufficient number of studies for laissez-faire leadership using other measures than the MLQ does not allow calculating separate meta-analyses for this leadership style.

For transformational leadership the split of the studies into the two groups and the subsequent separate meta-analytical calculations did not reveal any notable changes in the amounts of unexplained variance or any other variable. For transactional leadership the meta-analysis for the

group of studies using instruments other than the MLQ shows a somewhat increased amount of variance explained by the sampling error (42%). Interestingly this is contrary to what we expected to find. (We expected the group of studies using the MLQ to show a higher amount of explained variance than the group of studies not using the MLQ.) However, in the group of studies not using a MLQ measure the estimated true score correlation ($\hat{\rho} = 0.34$) is lower than in the overall meta-analysis for transactional leadership ($\hat{\rho} = 0.40$). That is studies using the MLQ tend to show a larger effect size with respect to transactional leadership and subordinate satisfaction than those using other measures.

With reference to our proposed hypotheses, Table 11 shows that for transformational and transactional leadership estimated true score correlations are positive and the confidence and credibility intervals exclude zero, thus confirming H1 and H2. Nevertheless, the amounts of variances explained by the sampling error are still low, suggesting further moderator variables and/or artifacts in the data.

4.3.2. Moderator 2: Subordinate satisfaction measurement

Now, we want to look at the other side of the leadership-satisfaction relationship. As outlined above, it is more frequently found in other meta-analysis of this research area to examine different measures of the criterion variable than to examine different measures of the predictor variable. At this point it is worthy to note that although we deal a lot with correlation coefficients in this work, which are bidirectional, it is common to denote the variable that potentially takes the role of a criterion variable as the criterion variable and the variable that potentially takes the role of a predictor variable as the predictor variable (e.g. Dumdum, Lowe & Avolio, 2002; Judge & Piccolo, 2004). In our case the criterion variable refers to the satisfaction variable, while the leadership styles represent our predictor variables. We did test for moderating effects on the side of the predictor variables (different leadership measures) above. In this section we test for moderating effects on the side of the criterion variable (different satisfaction measures).

In contrast to the test of Moderator 1, we will not split studies according to different instruments used to measure subordinate satisfaction, because the studies already differ in the types of satisfaction they measure. There is a whole range of different satisfaction types throughout the studies included in our meta-analysis. Among them are for example job satisfaction, employee

satisfaction, career satisfaction, satisfaction with leader, satisfaction with supervisor, and others. So, potential moderating effects could already stem from different types of subordinate satisfaction rather than from different instruments to measure one type of subordinate satisfaction.

Dumdum, Lowe and Avolio (2002) did face a similar situation in their meta-analysis. They put studies respectively correlation coefficients that measure satisfaction with the leader in one group and those measuring job satisfaction in another group. Then they calculated separate meta-analysis for the two groups of correlation coefficients. Information about the variances explained by the sampling error is not provided in their study, but their results show that the effect sizes of the corrected mean correlations for transformational and laissez-faire leadership for the group measuring satisfaction with the leader are substantially higher than for the group measuring job satisfaction. For transactional leadership they report a slightly lower corrected mean correlation for the satisfaction with the leader group than for the job satisfaction group. The study by Judge and Piccolo (2004) did not conduct any moderator analysis with respect to this issue, because in their study they distinguished right from the beginning between results for the measure of job satisfaction and for the measure of satisfaction with leader as outlined in Table 10. Overall, their results are consistent with those of Dumdum, Lowe and Avolio (2002). The effect size of the corrected mean correlation is higher when meta-analytical results are calculated for the measure of satisfaction with leader. These results make sense if we consider that job satisfaction is an aggregated satisfaction measure that refers to many dimensions of a job (not only the satisfaction with the leader dimension), while satisfaction with the leader is a very specific measure of satisfaction and is more directly related to the leadership style of a supervisor than job satisfaction.

We follow a similar approach to group our studies as Dumdum, Lowe and Avolio (2002) did and put those correlations that use a more direct satisfaction with leadership measure (e.g. satisfaction with leader, satisfaction with supervisor) in one group and those correlations that stem from a more general satisfaction measure (e.g. job satisfaction, employee satisfaction, career satisfaction) in another group. Then again two separate meta-analyses are calculated. We would expect both meta-analyses to show increased amounts of variances explained by the sampling error, if the different satisfaction measures function as a moderator variable. Also, we

expect to find larger effect sizes for the corrected mean correlations (estimated true score correlations) for the meta-analyses that are calculated for the direct leadership satisfaction measure group than for those calculated for the general satisfaction measure group. This last assumption is based on the results retrieved from the studies by Dumdum, Lowe and Avolio (2002) and Judge and Piccolo (2004) as outlined above. Our results with respect to different satisfaction measures are presented in Table 12.

Table 12 – Results for Moderator 2: Satisfaction measurement

Moderator	Transformational Leadership		Transactional Leadership		Laissez-faire Leadership	
	Leader	General	Leader	General	Leader	General
Total Sample Size N	2,952	9,403	1,440	3,629	1,684	2,505
Number of Correlation Coefficients k	13	33	8	18	10	8
Range of Correlation Coefficients	0.42 to 0.88	0.14 to 0.91	0.07 to 0.76	0.08 to 0.66	-0.72 to 0.17	-0.59 to -0.05
Mean Uncorrected Correlation $\bar{r}$	0.65	0.43	0.38	0.32	-0.44	-0.26
Estimated True Score Correlation $\hat{\rho}$	0.72	0.48	0.45	0.38	-0.52	-0.32
Variance due to Sampling Error in %	5%	5%	8%	30%	4%	7%
80% Credibility Interval	0.40 to 1.00	0.18 to 0.78	0.10 to 0.80	0.23 to 0.53	-1.00 to -0.03	-0.61 to -0.03
95% Confidence Interval	0.58 to 0.86	0.40 to 0.56	0.25 to 0.65	0.32 to 0.44	-0.77 to -0.28	-0.48 to -0.15

This time we are able to calculate two separate meta-analyses for each of the three leadership styles as we find enough studies for both groups (Leader, General) for each leadership style. For

transformational leadership 13 correlation coefficient refer to a more direct leadership satisfaction measure (group labeled as 'Leader' in Table 12) and 33 to a more general satisfaction measure (group labeled as 'General' in Table 12). For transactional leadership we put 8 correlations in the leader group and 18 in the general group and for laissez-faire leadership we put 10 correlations in the leader group and 8 in the general group.

With respect to our assumption about larger effect sizes of the mean correlations for results based on the leader group, we can retrieve from Table 12 that this assumption holds true. For each leadership style the effect size of the estimated true score correlation is larger for the leader group than for the general group. This is especially true for transformational and laissez-faire leadership as here the gaps between the two groups are substantial. Hence, the behavior of a supervisor has a greater effect on the subordinates' satisfaction with the supervisor than on a more general measure of the subordinates' satisfaction like job satisfaction. Nevertheless, the values referring to the variances explained by the sampling error are still low, ranging from 4% to 30%. Only for the general group of transactional leadership this value could be improved somewhat (30%).

Referring to our proposed hypotheses, we find a similar picture as in the test of Moderator 1. The results from Table 12 reveal that all estimated true score correlations show the expected sign and all confidence and credibility intervals exclude zero. However, the portions of variances explained by the sampling error are still low, suggesting further moderator variables and/or artifacts in the data.

4.3.3. Moderator 3: Organization type

Another in this research area frequently analyzed moderator is the difference in the types of the organizations that study participants belong to (e.g. Fuller, Patterson, Hester & Stringer, 1996; Lowe, Kroeck & Sivasubramaniam, 1996; Dumdum, Lowe & Avolio, 2002; Judge & Piccolo, 2004).

Fuller, Patterson, Hester and Stringer (1996) distinguish between a military and a civilian organizational context and find that for the group of civilian organizations the corrected mean correlation between charismatic leadership (a subscale of transformational leadership) and satisfaction is slightly higher than for the group of military organizations. Nevertheless, in their

study the proportions of sampling error variances in the total variances remain low after controlling for the organizational context.

Lowe, Kroeck and Sivasubramaniam (1996) distinguish between public and private organizations. They provide results for some subscales of transformational and transactional leadership and show that for all the examined subscales the mean corrected correlation is higher for public organizations when compared to private organizations.

Similarly, Dumdum, Lowe and Avolio (2002) also distinguish between public and private organizations. They provide detailed results for both subscales and overall leadership scales. For the overall leadership scales of transformational and laissez-faire leadership the effect size of the corrected mean correlations is larger for public than for private organizations. Due to an insufficient amount of data the authors cannot provide results for the overall leadership scale of transactional leadership. For the subscales of transformational and transactional leadership the results are mixed. For some subscales the effect size of the corrected mean correlation is larger for public organizations, for other subscales the effect size of the corrected mean correlation is larger for private organizations.

Judge and Piccolo (2004) apply a more detailed approach and distinguish between four different organizational settings: business, college, military, and public sector. In their study moderator analysis results are only provided for the overall leadership scale of transformational leadership and the contingent reward subscale of transactional leadership. The results are as follows. For transformational leadership the order from the highest corrected mean correlation to the lowest corrected mean correlation is: military, public sector, business, college. For the contingent rewards subscale the order from the highest corrected mean correlation to the lowest is: business, military, public sector, college. So, the order changes with respect to the group of business type organizations. Generally, the differences in the corrected mean correlations for the four groups are small when transformational leadership is considered and are larger when calculated for the contingent reward subscale.

We tried to follow the approach of Lowe, Kroeck and Sivasubramaniam (1996) and Dumdum, Lowe and Avolio (2002) to distinguish between public and private organizations, but it proved difficult to find out whether the participants of each study belonged to a publicly or privately

held organization as many studies do not provide enough information in this regard. Therefore, we decided to adapt our classification slightly and to group the studies according to a for-profit/not-for-profit characteristic. Organizations like schools, universities, hospitals or publicly operated organizations were assumed to be not-for-profit organizations, whereas organizations like banks, hotels, insurance companies or private operated organizations were assumed to be for-profit organizations. Some studies had to be excluded from this analysis, because either they incorporated data from both for-profit and not-for-profit organization participants or did not provide any information about the type of organization the participants belonged to, so no inference about the organizational setting could be made in such a case. Still, enough studies could be classified to conduct separate meta-analyses for each of the three leadership styles.

Even though the results vary for the four meta-analyses outlined above, there is still a tendency towards larger effect sizes for publicly held organizations when compared to private organizations. This is especially true for the two studies whose approach we tried to follow. Hence, for our analysis we would expect the effect size of the corrected mean correlations to be larger for the calculations based on the groups of not-for-profit organizations than for the calculations based on the groups of for-profit organizations. The results of our analysis are presented in Table 13.

Table 13 – Results for Moderator 3: Organization type

Moderator	Transformational Leadership		Transactional Leadership		Laissez-faire Leadership	
	Not-For-Profit	For-Profit	Not-For-Profit	For-Profit	Not-For-Profit	For-Profit
Total Sample Size N	3,982	4,863	1,335	2,231	1,547	1,046
Number of Correlation Coefficients k	16	21	10	11	7	7
Range of Correlation Coefficients	0.23 to 0.91	0.29 to 0.87	0.08 to 0.70	0.07 to 0.76	-0.63 to 0.15	-0.64 to 0.17
Mean Uncorrected Correlation $\bar{r}$	0.50	0.56	0.36	0.33	-0.21	-0.40
Estimated True Score Correlation $\hat{\rho}$	0.56	0.63	0.41	0.40	-0.25	-0.47
Variance due to Sampling Error in %	3%	10%	16%	13%	6%	5%
80% Credibility Interval	0.18 to 0.94	0.41 to 0.86	0.14 to 0.67	0.15 to 0.65	-0.63 to 0.13	-0.93 to -0.00
95% Confidence Interval	0.41 to 0.71	0.55 to 0.71	0.27 to 0.55	0.27 to 0.52	-0.48 to -0.03	-0.74 to -0.19

For transformational leadership 16 correlation coefficients were assigned to the group of not-for-profit organizations, 21 to the group of for-profit organizations and 9 had to be excluded for reasons described above. For transactional leadership 10 correlations were assigned to the not-for-profit group, 11 to the for-profit group and 5 had to be excluded and for laissez-faire leadership 7 correlations coefficients were put in each of the two groups and 4 had to be excluded.

Our assumption that the effect size of the mean corrected correlations should be larger in the groups of not-for-profit organizations cannot be confirmed. Only for transactional leadership the mean corrected correlation is slightly higher for the group of not-for-profit organizations

($\hat{\rho} = 0.41$) than for the group of for-profit organizations ($\hat{\rho} = 0.40$). For the other two leadership styles the effect size of the mean corrected correlation for for-profit organizations exceeds the one for not-for-profit organizations. More generally speaking, subordinates in for-profit organizations tend to be more satisfied with transformational leadership than subordinates in not-for-profit organizations, subordinates in not-for-profit and for-profit organizations are about equally satisfied with transactional leadership, and subordinates in not-for-profit organizations tend to tolerate laissez-faire leadership more than subordinates in for-profit organizations. But, as in the first and second moderator test, we do not find any substantial improvements with regards to the amounts of unexplained variances. The portions of variances explained by the sampling error are still low, ranging from 3% to 16%.

With respect to our proposed hypotheses, this time we can see that although all estimated true score correlations again show their expected sign, for laissez-faire leadership the 80% credibility intervals include zero (Not-for-profit: $CV_{80\%} = -0.63$ to 0.13 ; For-profit: $CV_{80\%} = -0.93$ to -0.00). Thus, the nonzero characteristic for laissez-faire leadership is not fulfilled and the proposed hypothesis with respect to laissez-faire leadership is rejected in this case. For transformational and transactional leadership the results remain unchanged. Their intervals exclude zero, therefore the nonzero characteristic is given and the proposed hypotheses for these two leadership styles remain confirmed. Nevertheless, the values for the explained respectively unexplained variances are still unsatisfactory, suggesting further moderator variables and/or artifacts in the data.

4.3.4. Moderator 4: Geographical location

While in the previous sections we did examine some potential moderators that are frequently tested in meta-analyses of this research area, our last moderator test is one that was less often tested so far. In fact, no meta-analysis with a similar research focus could be identified that tested a comparable moderator variable as the one examined in this section. This is interesting when we think of research that suggests different management practices in different regions due to differences in cultural respectively national aspects.

For instance, Hofstede's (1980) classical work on cultural dimensions suggests that leadership practices will vary from country to country. His dimension about power distance, for example,

which refers to the acceptance of unequally distributed power in a society, might influence the applied leadership styles in a society. Also, his individualism-collectivism dimension, which relates to social ties in a society, suggests influencing leadership practices in a society. While in an individualistic culture people tend to care only about themselves and their close family members, in a collectivistic culture people usually have an extended circle of people they care about. Hence, in societies with low power distance a more participative leadership style like transformational leadership might be more effective. Or, in societies that score high on individualism less participative leadership styles like transactional or laissez-faire leadership might be more effective than other leadership styles.

Later on, other researchers dealt with the topic of leadership in different geographical locations. Blunt and Jones (1997), for example, argue that due to differences in attitudes towards authority, loyalty and interpersonal harmony Western leadership practices might not be fully applicable to East Asia or Africa. Further, Javidan and Carl (2004) report that there are both similarities and differences in the charismatic leadership profiles of Western and Eastern executives. The authors assume that the differences stem from cultural discrepancies, while the similarities are due to universal intrinsic human values.

Therefore, it is deemed worthwhile to examine if study results vary between geographical locations due to underlying cultural differences. In this regard we conduct a final moderator test. We again split studies in two groups and calculate separate meta-analyses. In the first group we put studies that were performed in Western countries and in the second group we put those studies that were performed in Nonwestern countries. Western countries in this case comprise the United States, European countries and Australia, while Nonwestern countries comprise countries from South America, Africa and Asia. We again form only two groups to generate more solid results by having a reasonable number of studies in each group. Some studies had to be excluded from the analysis as they did mix results from different geographical locations or did not provide information about the geographical location of their study participants.

Due to the lack of results with regards to such a moderator test in previously conducted meta-analyses and the possibility to argue in different directions, it is difficult to form expectations about possible outcomes in advance. For example, one could argue that because of generally lower power distance (less authority) in Western societies a more participative leadership style

like transformational leadership might be more effective in Western countries compared to Nonwestern countries. On the other hand, one could also argue that Western countries tend to be more individualistic (less loyalty, less interpersonal harmony) and thus a participative leadership style like transformational leadership might be more effective in Nonwestern countries, which in general tend to score higher on collectivism. Hence, we do not form any specific expectations before the analysis. The results of our analysis are presented in Table 14.

Table 14 – Results for Moderator 4: Geographical location

Moderator	Transformational Leadership		Transactional Leadership		Laissez-faire Leadership	
	Western	Not Western	Western	Not Western	Western	Not Western
Total Sample Size N	3,549	6,382	1,918	2,527	2,271	1,294
Number of Correlation Coefficients k	19	22	12	12	11	5
Range of Correlation Coefficients	0.25 to 0.91	0.23 to 0.89	0.07 to 0.76	0.26 to 0.50	-0.64 to -0.09	-0.24 to 0.17
Mean Uncorrected Correlation $\bar{r}$	0.54	0.51	0.32	0.35	-0.41	-0.07
Estimated True Score Correlation $\hat{\rho}$	0.59	0.57	0.37	0.42	-0.49	-0.08
Variance due to Sampling Error in %	5%	6%	10%	36%	8%	3%
80% Credibility Interval	0.25 to 0.93	0.31 to 0.84	0.04 to 0.69	0.30 to 0.55	-0.83 to -0.16	-0.54 to 0.38
95% Confidence Interval	0.47 to 0.72	0.48 to 0.66	0.21 to 0.52	0.35 to 0.49	-0.66 to -0.33	-0.40 to 0.24

For transformational leadership we find 19 correlation coefficients in the group of Western countries, 22 in the group of Nonwestern countries and 5 had to be excluded from the analysis. For transactional leadership we find 12 correlations in each of the two groups and 2 had to be excluded. For laissez-faire leadership 11 correlations are put in the group of Western countries, 5 in the group of Nonwestern countries and again 2 had to be excluded.

We identify little differences between Western and Nonwestern countries in the estimated true score correlations for transformational (Western: $\hat{\rho} = 0.59$; Nonwestern: $\hat{\rho} = 0.57$) and transactional leadership (Western: $\hat{\rho} = 0.37$; Nonwestern: $\hat{\rho} = 0.42$). These values are close to the respective values in the overall meta-analysis (Transformational: $\hat{\rho} = 0.54$; Transactional: $\hat{\rho} = 0.40$). Only for laissez-faire leadership we can identify a substantial difference in the estimated true score correlation between Western and Nonwestern countries (Western: $\hat{\rho} = -0.49$; Nonwestern: $\hat{\rho} = -0.08$). While for the group of Western countries the effect size is slightly larger than in the overall meta-analysis ($\hat{\rho} = -0.40$), the effect size for Nonwestern countries is substantially smaller than the effect size in the overall meta-analysis. Hence, according to our analysis the effectiveness of transformational and transactional leadership is about the same in Western and Nonwestern countries, but Nonwestern countries are more likely to tolerate laissez-faire leadership.

Also, with respect to our proposed hypotheses, we see that for the group of Nonwestern countries of laissez-faire leadership the confidence interval ($CI_{95\%} = -0.40$ to 0.24) and credibility interval ($CV_{80\%} = -0.54$ to 0.38) include zero. Therefore, the hypothesis with respect to laissez-faire leadership is rejected in this case. For the other leadership styles the estimated true score correlations show the expected sign and the intervals exclude zero in all cases, thus the other hypotheses remain confirmed.

5. Discussion

From our results we retrieve that all in all there is a positive relationship between transformational leadership and subordinate satisfaction, a positive relationship between transactional leadership and subordinate satisfaction and a negative relationship between laissez-faire leadership and subordinate satisfaction. We summarize our results in Table 15.

Table 15 – Results overview

		Transformational Leadership	Transactional Leadership	Laissez-faire Leadership
Estimated True Score Correlation $\hat{\rho}$	Narrow Approach	0.52 ^{a) b)}	0.43 ^{a) b)}	-0.47 ^{a) b)}
	Broad Approach	0.54 ^{a) b)}	0.40 ^{a) b)}	-0.40 ^{a) b)}
	Moderator 1 (MLQ)	0.54 ^{a) b)}	0.42 ^{a) b)}	n/a
	Moderator 1 (Not MLQ)	0.54 ^{a) b)}	0.34 ^{a) b)}	n/a
	Moderator 2 (Leader)	0.72 ^{a) b)}	0.45 ^{a) b)}	-0.52 ^{a) b)}
	Moderator 2 (General)	0.48 ^{a) b)}	0.38 ^{a) b)}	-0.32 ^{a) b)}
	Moderator 3 (Not-For-Profit)	0.56 ^{a) b)}	0.41 ^{a) b)}	-0.25 ^{b)}
	Moderator 3 (For-Profit)	0.63 ^{a) b)}	0.40 ^{a) b)}	-0.47 ^{b)}
	Moderator 4 (Western)	0.59 ^{a) b)}	0.37 ^{a) b)}	-0.49 ^{a) b)}
	Moderator 4 (Not Western)	0.57 ^{a) b)}	0.42 ^{a) b)}	-0.08
Range of Estimated True Score Correlation $\hat{\rho}$		0.48 to 0.72	0.37 to 0.45	-0.52 to -0.08

Notes: n/a = not available. ^{a)} 80% Credibility Interval excludes zero. ^{b)} 95% Confidence Interval excludes zero.

We find that the positivity of the relationships for transformational and transactional leadership is robust and that we could confirm our hypotheses for these two leadership styles (H1 and H2) in all cases. We also see that in all cases transformational leadership reveals a stronger relationship to subordinate satisfaction than transactional leadership. The negativity of the relationship for laissez-faire leadership is less robust. In some cases we could not confirm our hypothesis for this leadership style (H3). More precisely, in our moderator tests regarding organization type and geographical location we could not exclude zero from the credibility and confidence intervals in all cases.

Looking at these findings through the lens of management science, we discuss the managerial implications of our results in section 5.1. In section 5.2 we identify some of the limitations of this work and in section 5.3 we conclude the thesis briefly.

5.1. Managerial implications

Ranking the relationships from positive to negative, we obtain the following ranking from Table 15: transformational leadership (1), transactional leadership (2), laissez-faire leadership (3). This ranking is confirmed by the results of other meta-analyses (see Table 10). It means that transformational leadership dominates transactional leadership in generating higher subordinate satisfaction and transactional leadership dominates laissez-faire leadership in this regard.

We note that correlations do not give us information about causality. For example, we could observe that transformational leadership causes subordinates to be more satisfied. But, we may also observe the other direction. We could observe that more satisfied subordinates cause leaders to adapt a more transformational leadership style. An estimated true score correlation does not give us information about which direction is true. Nevertheless, previous research shows that the tested leadership styles are predictive for subordinate satisfaction (e.g. Judge & Piccolo, 2004). Hence, we assume the direction to apply that leadership causes subordinate satisfaction.

From this we derive that in order to increase subordinates' satisfaction a manager ideally makes use of transformational leadership. Still beneficial, but less than transformational leadership, is transactional leadership. Counterproductive in this regard is laissez-faire leadership. One might expect that not leading at all might not affect a subordinate's satisfaction. But, as our results

show, the absence of leadership even decreases subordinate satisfaction. Hence, we generally recommend to leaders in organizations to apply a transformational leadership style.

As we pointed out in our introductory chapter, the number one reason in Austria for employees to leave their employer is the dissatisfaction with the leadership (Brence, Nowshad, Wallner & Bauer, 2019). We, therefore, urge managers in particular to make use of transformational leadership so as not to lose employees unintentionally.

Our moderator analysis also shows that the ranking – transformational (1), transactional (2), laissez-faire (3) – is robust across organizations of different types and at different geographical locations. No matter if the manager is operating in a not-for-profit or for-profit organization or in an organization located in the West or the East, transformational leadership dominates transactional leadership and transactional leadership dominates laissez-faire leadership with respect to subordinate satisfaction. We, therefore, cautiously recommend transformational leadership to all leaders in organizations regardless of the organizational and geographical context.

Clearly, in the first place managers can adapt their own leadership style to improve their subordinates' satisfaction. But, many managers will also have the potential to influence how other leaders in the organization lead. Accordingly, we advise managers to consider our findings as well when making decisions about recruitment, promotion and training.

For example, by hiring people with transformational leadership skills managers can influence the leadership styles applied by their colleagues. As we pointed out in section 2.4, Eagly, Johannesen-Schmidt and Van Engen (2003) report that women tend to use transformational leadership more than men while men tend to use laissez-faire leadership more than women. Therefore, contrary to the established practice, it might be beneficial for organizations to bring women into leadership positions. Also, research suggests that personality influences leadership behavior (e.g. Rubin, Munz & Bommer, 2005; Bono & Judge, 2004). Thus, hiring the right people seems to be crucial in this respect.

Next, managers should also consider our findings when they need to make promotion decisions. Climbing up the hierarchical ladder in organizations often coincides with taking on leadership responsibilities. Therefore, we recommend not to solely base promotion decisions on the

technical competence of employees, but to incorporate leadership abilities in the decision-making process.

Finally, managers can influence their colleagues' leadership styles through training. Research showed for example that transformational leadership is trainable (e.g. Barling, Weber & Kelloway, 1996). Hence, managers do not necessarily have to recruit and promote employees to get transformational leaders into key positions, but they can also assign training programs to employees to improve their leadership skills in order to improve subordinates' satisfaction.

5.2. Limitations

We also want to discuss some limitations of this work. First, as briefly outlined in section 3.2, study availability represented a major restriction for this thesis. With the access to additional studies our results could have been further refined. This would have been especially interesting in the case of laissez-faire leadership. Here the results were not that robust as opposed to the results regarding transformational and transactional leadership. Hence, the inclusion of additional studies might have helped us in generating even more precise outcomes. Nevertheless, we believe that we were able to include a reasonable number of studies to deliver reliable results.

Second, in our analyses the values for the variances explained by the sampling error are consistently low, ranging from 3% to 42%. We did test four potential moderators, but compared to the 75% threshold advised by Hunter and Schmidt (2004), we could not improve these values up to a satisfactory level, where further moderators and/or artifacts in our data can be ruled out.

Third, in this thesis we analyzed the aggregated leadership styles of transformational, transactional and laissez-faire leadership. In section 2.2 we showed that these aggregated leadership styles may consist of several subscales. We did not report results on these subscales, but previous research shows that for an aggregated leadership style some subscales may reveal a positive while other subscales may reveal a negative relation to subordinate satisfaction (e.g. Dum Dum, Lowe & Avolio, 2002; Judge & Piccolo, 2004). Thus, our results are limited with respect to the findings of other researchers that not all leadership traits of a leadership style may have a positive impact on subordinate satisfaction when its aggregated measure reveals a positive relation to subordinate satisfaction.

Finally, as Hunter and Schmidt (2004) pointed out, studies are never perfect and they always contain some sort of imperfections. Therefore, we do not expect this thesis to be perfect either and remind the reader that it may contain some sort of imperfections. But, as Hunter and Schmidt (2004, p. 103) also point out, “*it is important to bear in mind that in research, as in other areas, “the perfect is the enemy of the good”*”.

5.3. Conclusion

At the beginning of this thesis we asked the question ‘*How is leadership related to subordinate satisfaction?*’. We learned that there are many typologies to classify leadership behavior and that many leadership styles are positively related to subordinate satisfaction. It is leadership like authentic, consideration, ethical, servant, and transformational leadership that seem to have a positive impact on subordinates’ satisfaction. What these leadership styles have in common is that they are considerate of subordinates’ wishes, expectations and needs. It is in turn the very definition of satisfaction that the fulfillment of wishes, expectations and needs leads to satisfaction. Thus, after all it seems plausible and intuitive that it is this kind of leadership that is positively related to the satisfaction of subordinates.

We then looked in more detail at the extensively researched leadership styles of transformational, transactional and laissez-faire leadership, and found a positive relationship for transformational leadership, a somewhat less positive relationship for transactional leadership and a negative relationship for laissez-faire leadership. This again supports the argument made above, that the most considerate leadership style has the most positive impact on subordinate satisfaction. But, what we can also learn from these findings is that as a leader it is worst not to lead at all. It is better to apply some sort of appropriate leadership than to avoid leadership in order to avoid being a bad leader. Thus, we encourage leaders to take on their leadership responsibilities, to be considerate of their subordinates and not to be passive or avoidant in their leadership style.

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Appendix

The appendix includes an abstract in English and an abstract in German.

Abstract (English)

This thesis investigates the relationship between leadership and subordinate satisfaction. First, an overview of different leadership styles and their relation to subordinate satisfaction is provided. Then we look in more detail at the three leadership styles: transformational, transactional and laissez-faire leadership. The method of meta-analysis is used to find a positive, nonzero relationship for transformational leadership, a positive, nonzero relationship for transactional leadership, and a negative, nonzero relationship for laissez-faire leadership. In a moderator analysis we test the four potential moderators: leadership style measurement, subordinate satisfaction measurement, organization type and geographical location. The results remain robust throughout the moderator analysis, only for laissez-faire leadership the nonzero characteristic could not be confirmed in all cases. Nevertheless, none of the four moderator tests is able to rule out further moderators and/or artifacts in our data.

Abstract (German)

Diese Masterarbeit untersucht den Zusammenhang zwischen Führung und Untergebenen-Zufriedenheit. Zuerst wird ein Überblick über verschiedene Führungsstile und deren Beziehung zu Untergebenen-Zufriedenheit bereitgestellt. Dann werfen wir einen genaueren Blick auf die drei Führungsstile: transformative, transaktionale und Laissez-faire Führung. Die Methode der Meta-Analyse wird verwendet, um einen positiven, von Null verschiedenen Zusammenhang für transformative Führung, einen positiven, von Null verschiedenen Zusammenhang für transaktionale Führung, und einen negativen, von Null verschiedenen Zusammenhang für Laissez-faire Führung zu finden. In einer Moderatoren-Analyse testen wir die vier potentiellen Moderatoren: Führungsstilmessung, Untergebenen-Zufriedenheitsmessung, Organisationstyp und geographische Lage. Die Ergebnisse erweisen sich durch die Moderatoren-Analyse als stabil, nur für den Laissez-faire Führungsstil ist der Zusammenhang nicht in allen Fällen von Null zu unterscheiden. Dennoch ist keiner der vier Moderatoren-Tests in der Lage weitere Moderatoren und/oder Artefakte in unseren Daten auszuschließen.